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Making links between theory and  
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with an online simulation

Lisa A. Carrington  
University of Wollongong

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Making links between theory and practice: An investigation into pre-service teacher learning experiences with an online simulation.

A thesis submitted in fulfilment of the requirements for the award of the degree

**Doctor of Philosophy**

From the

**University of Wollongong**

by

**Lisa A. Carrington**

Bachelor of Education (Hons)

Faculty of Education

2009

## Declaration

---

I, Lisa A. Carrington, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Education, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at this or any other academic institution.

Signed:

---

Lisa A. Carrington

November, 2009

## Acknowledgements

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Foremost, I express my sincere gratitude to my advisors *Prof. Brian Ferry* and *Dr Lisa Kervin* for their continuous support of my PhD research. I could not have imagined having better advisors and mentors for my PhD. *Prof. Brian Ferry* - Your expertise, kindness, patience, and most of all your enthusiasm for my personal and professional growth has helped shape me into the woman you now know. Thanks for making molehills out of my mountains. *Dr Lisa Kervin* - Thank you for your continued guidance, support and encouragement. Your immense knowledge, attention to detail, and generosity has made this journey a reality. Sometimes the simple words say it best... Thank you from the bottom of my heart.

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To my family - the most important people in my life. Without you none of this could have been possible. Not only did you raise me to believe in myself, but you also gave me the tools to do so. *Mum* - You are my strength and my idol. I can only hope to become half the woman you are. *Dad* - You and I are different, but in many ways the same. Thank you for our constant challenges. It has helped make me the person I am today. *Kim* and *Daniel* - my best friends. Growing up with you both is something I wouldn't trade for the world. We only had each other, but that was all we needed. Just knowing you both has made my life better.

*Michael Long* - thank you for your support and encouragement. You are my world.

Current research in teacher education identifies a gap between what teachers are taught during their pre-service teacher education and what they are expected to do at the ‘chalk-face’ in their professional career (Cole & Knowles, 2000; Ramsey, 2000; Sorin, 2004). In response to the perception that theory is often irrelevant to practice, various studies assert that there is a need to integrate the various components of pre-service teacher education (for relevant studies see Brady, Seagal, Bamford & Deer, 1998; Lanier & Little, 1986). An integrated approach is advocated to enable pre-service teachers to gain a better understanding of the theory/practice nexus (Educational Training Committee, 2005; MACQT, 1998). In response to such studies, teacher educators are motivated to investigate strategies that might more effectively and relevantly bridge the gap between theory and practice.

One approach has been to use simulations as a tool to experiment with practical scenarios while providing explicit links to the theory of pre-service teacher training. Simulations have the potential to enhance a learning experience by providing authentic and relevant scenarios in which learners apply their newly-acquired knowledge by experimenting and making decisions within a safe, virtual environment in which mistakes have no consequences, such as they have in the real world (Carrington, Ferry & Kervin, 2006; Aldrich, 2004; Jonassen, 2000). Limited research has been conducted on the use of simulations in pre-service teacher education and how engagement with simulations can support the learning of pre-service teachers.

The purpose of this inquiry was to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation - *ClassSim* - to link knowledge from university coursework with field experiences, in particular, whether and how experience with an online simulation contributed to the development of pre-service teachers’ emerging professional identity. A comparative case analysis was adopted, as this design was considered most appropriate as it allowed for an in-depth comparison of two cohorts of pre-service teachers. Andragogy (Knowles, 1970, 1980,

1984; Knowles, Holton & Swanson, 1998) provide a theoretical framework through which the learning of pre-service teachers was examined and assumptions about their learning drawn.

The findings indicate that virtual learning environments, such as *ClassSim*, provide significant potential for teacher education as theory is integrated with virtual practice. It was found that in order to facilitate an adults' learning within a virtual learning environment, educators must embrace the opportunities afforded by the technology. Virtual learning environments provide flexibility as learners engage with the learning environment anytime, anywhere, and at their own pace. To respond to the needs of adult learners, a virtual learning environment should have an interactive design, be learner-centred and able to facilitate and motivate self-direction in learners. Furthermore, the inclusion of practical real-life scenarios in conjunction with relevant learning/teaching theories is essential if a user is to develop an understanding of the theory-to-practice connection as they develop their professional identity.

Overall, this inquiry has highlighted a number of important learning design principles an adult educator should take into consideration when designing and implementing virtual learning experiences for adult learners. It highlights the importance of a strong theory-to-practice connection in the development of a professional identity, which is explored in this inquiry via reflection.



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# Chapter One

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## Introduction

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This chapter explains the purpose of this inquiry and the context in which it is situated. The purpose statement and research questions are outlined and definitions of relevant terms are provided. The underlying theoretical perspective is described and the research strategy is explained. A description of how this inquiry contributes to the existing body of literature can be found within this chapter, along with the inquiry's significance and limitations. The chapter concludes by outlining the structure of the remaining chapters that comprise this thesis.

## Background

A number of recent reviews in Australia have focused on pre-service teacher education. Many of these reviews were commissioned to respond to concerns about declining teaching standards and the lack of connection between the theory of pre-service teacher education and field experience. Examples include reviews by the Commonwealth Department of Education, Science and Training (CDEST, 2002), the Victorian Education and Training Committee (VETC, 2005), the Ministerial Advisory Council on the Quality of Teaching (MACQT, 1998), the NSW/ACT Independent Education Union (IEU, 2000) and Ramsey (2000). Overall, these reviews have consistently reported that many new graduates lack the practical teaching skills required to be an effective teacher. Each indicated that:

- Improvements need to be made to the pre-service field experiences and university coursework to better facilitate the development of connections between practical teaching skills and theoretical subject content.
- Initial teacher education programs should aim to integrate subject matter content and pedagogy into teaching and learning courses.
- Pre-service teachers need quality, classroom-based experience supervised by an accredited teacher mentor.

- Experience in the field is an essential component of any pre-service training program; however there must be a balance of tertiary preparation and quality field experience.
- Initial teacher education is too theoretical and does not adequately prepare beginning teachers for the complex range of student management issues they will be confronted with when in the field.

Overall, these reviews report that there is a gap between the theory of pre-service teacher education subjects and practice in diverse classroom settings. Highlighted in the reviews were a number of key considerations, each of which will be explored.

### **Linking Theory to Practice in Teacher Education**

Over the last couple of decades, a perceived theory-to-practice gap in teacher education has been widely discussed. Many student teachers report experiencing problems understanding the relationship between ‘theory’ and ‘practice’ in teacher education and often report finding ‘theories’ irrelevant to the development of teacher competences (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). Korthagen and Kessels (1999) suggest there are three major causes for this lack of theory-to-practice transfer. The first is an ‘apprenticeship of observation’ (Lortie, 1975:61) who asserts that pre-service teachers have been a student for a long period of time (12 to 15 years they spend as pupils), and as a result they develop preconceptions of teaching from observing teaching throughout their own schooling. The second has been called ‘feed-forward problem’ identified by Korthagen and Kessels (1999). They assert that this occurs when a pre-service teacher resists certain learning at the time of exposure, as they have not encountered a concrete problem, which required them to apply that knowledge. Thus the value of the theoretical knowledge is not clear to them and they are not motivated to study it. The third relates to the nature of relevant knowledge. This involves the belief that teachers require concrete answers to situations in which they have little time to think and plan, which is in contrast to the traditional, more abstract way in which pre-service teacher education presents theories of learning and teaching.

It has been suggested that a philosophy of reflective practice will help pre-service teachers articulate the theory-to-practice relationship and thus build stronger connections between the theory of their pre-service teacher education and the practicalities of the classroom (Brady, Seagal, Bamford & Deer, 1998; Grimmett, MacKinnon, Erickson & Rieken, 1990). Reflection and reflective practice is a means to learn from experience by integrating new knowledge and constructing a new understanding of existing knowledge. Shin (2006) suggested an integrative and reflective approach where student teachers are encouraged to construct their own philosophy of education integrating their experiences and personal practical knowledge with general educational theory. Several models of teacher education stress the continuing cycle of interplay between theory, practice and reflection as the way to promote changes in student teachers' attitudes and practices (Hill, 2000). Further, Korthagen (1999 & 2001) suggested a 'realistic approach', which is based upon the belief that students begin teacher education with certain preconceptions about teaching (based upon their time as a school student). To overcome these preconceptions Korthagen (1999 & 2001) suggested 'reframing' the students mind by restructuring their experiences and knowledge via a reflection model (ALACT model). Korthagen distinguished five phases in this process:

1. Action,
2. Looking back on the action,
3. Awareness of essential aspects,
4. Creating alternative methods of action, and
5. Trial, which in itself is a new action and, therefore, the starting point of a new cycle.

Moreover, Graham and Thornley (2000:237) believe that in order for a connection to be made between theory and practice "a mutual respect" must develop between schools and universities, so knowledge is presented to pre-service teachers in an accessible and integrated manner. However, the quantity and quality of field experience is likely to be variable and ways of supplementing field experience need to be considered.

## **Lack of Connection between Theory and Practice**

Achieving a balance between the theoretical and practical components of teacher education is one of the most important challenges currently facing those involved in the design, delivery and accreditation of teacher education (MACQT, 1998; Educational Training Committee, 2005). The reviews of pre-service teacher education have recommended that initial teacher education course should have stronger links between field experience and non-field experience learning; and these links should be made more explicit in pre-service teacher education (House of Representatives Standing Committee on Education and Vocational Training, 2007).

It has been suggested that the fundamental structure of pre-service teacher education is often the reason for a pre-service teacher's difficulty in linking theory to practice. Barone, Berliner, Blanhard, Casanova and McGowan (1996) state that pre-service teacher education often consists of a collection of separated courses in which theory is presented without much connection to practice. Furthermore Ben-Peretz (1995:546) said:

The hidden curriculum of teacher education tends to communicate a fragmented view of knowledge, both in course-work and in field experiences. Moreover, knowledge is 'given' and unproblematic. These views of knowledge are likely to become quite problematic as teachers gain experience.

Further, Calderhead (1988) explains that traditionally theory and practice were regarded as separate entities of teacher education. It was the responsibility of the university to teach the theory of teaching and learning, and the responsibility of the school and supervising teacher to explain and supervise classroom practice (Brady, Seagal, Bamford & Deer, 1998; Graham & Thornley, 2000). This separation of theory and practice often resulted in pre-service teachers attaching a higher value to their field experiences than their university studies as it was the practice component seen to be crucial to their survival upon entry into the profession (Lanier & Little, 1986). Sorin (2004:102) suggested that "student teachers often report a lack of connection between what is learned in university studies and in the classroom, and often report feeling unprepared for the 'real life' situations that face them in their first days of classroom

teaching”. Furthermore, Cole and Knowles (2000:9) claim that there is a gap between what teachers are taught during their pre-service teacher education and what they are expected to do at the ‘chalk-face’ in their professional career. Likewise, the Ramsey (2000) review of teacher education in New South Wales asserted that pre-service teachers do not understand how classroom practice produces effective student learning.

Kervin and Turbill (2003) found that the reason beginning teachers often find it difficult to adjust to classroom life is that they are often unable to retrieve important theoretical knowledge when they need it. Darling-Hammond’s (1999:34) research asserts that a “tighter coupling of theory and practice in the context of a broader and deeper base of knowledge about learning, development and teaching” is needed to help bridge the gap between university theory and classroom practice in pre-service teacher education. There is now a considerable body of literature supporting the claim that there is a need to integrate these aspects of pre-service teacher education and address the perceived irrelevance of theory to students (for typical studies see Brady, Seagal, Bamford & Deer, 1998; Lanier & Little, 1986), thus enabling pre-service teachers to gain a better understanding of the inter-relationships between theory and practice (MACQT, 1998; House of Representatives Standing Committee on Education and Vocational Training, 2007).

### **The Challenge of Field Experience**

The time spent in field experience, and the quality of the experience, are largely inadequate for supporting the learning needs of pre-service teachers. A number of limitations of the field experience include;

- Status and funding to support field experiences;
- Lack of time available in current teacher education course structure;
- The limited opportunity for pre-service teachers to receive a comprehensive range of experience whilst on field experience;
- Lack of communication between the practicum school and university;
- The quality of the guidance from the supervising teacher; and



- The logistics involved in allocating placement positions for all pre-service teachers (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000).

These themes are consistent across the reports.

In 2002 the Commonwealth Department of Education, Science and Training (2002:79) identified a number of inadequacies in pre-service teacher field experience. These included unclear expectations and limited commitment by schools, uneven quality of supervision, lack of time and “lack of funding to address these specifics”. Later the Education and Training Committee (2005) recommended that pre-service teacher field experience should represent at least 25 per cent of a pre-service teacher education course, with some stakeholders asserting that a 50 per cent split between university classes and school-based training was needed. The Committee recommended that the number of field experience days for pre-service teachers be increased to 130, as opposed to the then requirement of 60 days.

Although many of the reviews previously mentioned, as well as educational researchers such as Cambourne, Kiggins and Ferry (2003), have claimed that pre-service teacher education is enhanced through practical classroom experience, the high cost of field experience, university course requirements, and school needs and availability, place limits on the amount and quality of field experience available to pre-service teachers (NSW/ACT Independent Education Union, 2000). Thus simply recommending an increase in the number of field experience days for undergraduate pre-service teachers does not address the underlying problems regarding funding, university requirements, student time commitments and the pressures placed on schools.

A further problem is that current teacher education courses typically do not provide sufficient opportunities for pre-service teachers to develop strategies and techniques for responding to the learning and other needs of school students (CDEST, 2002; Education and Training Committee, 2005). The Ramsey (2000) review proposes that this may be a result of the narrow range of experiences pre-service teachers are exposed to whilst on

field experience. It was suggested that field experiences were not long enough to enable “sustained immersion in the craft of the profession” (Ramsey, 2000:62). Further, the Commonwealth Department of Education, Science and Training (2002) explains that the timing of the field experiences often means that students “do not experience issues related to assessment, reporting or dealing with parents. Nor are they involved in the roles and responsibilities teachers perform outside the classroom” (CDEST, 2002:106). Thus the Commonwealth Department of Education, Science and Training (2002) recommended that field experience should play a more central role in pre-service teacher education rather than being merely a peripheral experience. Further, field experience should be incorporated over the duration of the pre-service program as opposed to being a number of brief periods of practical experience. Overall, the reviews consistently recommend that the final pre-service teacher field experience should be across a more substantial time frame to enable pre-service teachers to plan, implement and evaluate a significant teaching assignment (CDEST, 2002:105; Education & Training Committee, 2005).

The Ministerial Advisory Council on the Quality of Teaching (1998) stated that the success of any pre-service teacher field experience largely depends upon the ability of the supervising teacher to provide pre-service teachers with much-needed examples of quality teaching. However, the Commonwealth Department of Education, Science and Training (2002) reports that supervisors are often chosen on the basis of convenience, rather than on their suitability for this role. As a result the pre-service teachers may adopt the habits and methods of their supervising teacher without fully evaluating their merit (Brown, 1999). In response to such findings the Commonwealth Department of Education, Science and Training (2002:106) recommended that supervisors be “carefully selected on the basis of interest, commitment, skill and understanding of the role”, or to expose the pre-service teachers to a range of teaching styles by using a team of teachers to supervise pre-service teachers during their field experience, as opposed to an individual supervising teacher. While these are sound recommendations, implementing these can be problematic for both schools and teacher education providers.

## **Mandated Changes in University Coursework**

In recent years governments in Australia have responded to various reviews of teacher education by mandating specific subjects for all future teachers. An example is in the area of behaviour management. In 1998, the Ministerial Advisory Council on the Quality of Teaching (1998) reported that a number of beginning teachers found their university coursework to be ineffective as it did not adequately prepare them for the range of management issues that they will need to respond to in the classroom. As a result of this finding it was recommended that behaviour management subjects should become a compulsory part of pre-service teacher coursework, focusing on specific examples of good practice. Other improvements to university coursework have been in the areas of basic literacy, numeracy, ICT and Aboriginal Education (House of Representatives Standing Committee on Education and Vocational Training, 2007).

## **Simulation as a Response to Identified Issues**

Teacher educators have looked to more effective and relevant ways of addressing the limitations of pre-service teacher field experience (as discussed above) and bridging the gap between ‘theory’ and practice. One approach that has been examined is to use simulations as a tool to experiment with practical scenarios while providing explicit links to the theory of pre-service teacher training, without the problems typically associated with current pre-service teacher field experiences (Ferry, Kervin, Cambourne, Turbill, Hedberg & Jonassen, 2005; Zibit & Gibson, 2005). Within the domain of teacher education, Albion and Gibson (1998) suggest the use of instructional approaches, within an interactive multimedia environment, that motivates students to engage with authentic problems and to develop the attitudes and skills required for lifelong independent learning. Furthermore, Herrington and Oliver (2000) suggest that educators need to look for ways to create authentic environments that allow learners to develop integrated knowledge that is retrievable in real-life settings in addition to traditional field experiences. They believe that a multimedia virtual environment such as a simulation can be an alternative to real-life experience, as simulations have the potential to provide pre-service teachers with a safe, authentic environment in which

they can experiment with decision-making opportunities while drawing upon their theoretical and practical knowledge before entering a classroom, provided the simulation is designed so that it does not sacrifice the authentic context. Thus, a simulation in pre-service teacher education must be designed to authentically represent real world activities. Opportunities need to be provided for students to examine the task from different perspectives, using a variety of resources, and reinforce the idea that there is no one correct answer; rather there are multiple options with varying outcomes (Herrington, Oliver & Reeves, 2003). Overall, when the opportunities afforded by simulations are examined in connection with areas recommended for further development in teacher education, they might appear to offer a practical solution to some of the complex problems mentioned previously in this chapter.

Although limited research has been conducted on the use of simulations in pre-service teacher education and how engagement with simulations can support the learning of pre-service teachers, Kneebone and ApSimon (2001:910) assert that multimedia simulations can combine theory with practice to facilitate effective learning. Therefore, a virtual learning environment such as a simulation may enhance the development of pre-service teachers' connections between university 'theory' and the practicalities of the classroom. This study is a contribution to this aspect of the literature by focusing on pre-service teacher use of an online simulation to enhance links between their course work and field experience.

## **ClassSim**

The virtual learning environment, ClassSim, was conceptualised by Ferry, Kervin, Cambourne, Turbill, Hedberg, and Jonassen and was developed with the support of a large ARC grant (project ID DP0344011) with the purpose of supporting existing teacher education programs via additional classroom experience within a virtual environment. 'ClassSim' (Faculty of Education, 2005, University of Wollongong) enables the user to assume the role of a kindergarten teacher in a virtual classroom. Throughout the running time of the simulation the user is required to make decisions about the structure and sequence of a 'literacy block' classroom management and

respond to individual students. A number of features have been included in the design of the virtual learning environment for the user to interact with. These include the incorporation of targeted students, an embedded tool called the ‘Thinking Space’, support materials and decision-making opportunities.

The targeted students were designed to represent the more challenging students teachers are often faced with in the classroom, while also being representative of the range of needs and abilities of students within a typical classroom. ‘Student Updates’ are available during each of the episodes at varying times, usually during and after a behaviour management incident or a significant teaching moment. Figure 1.1 shows an example of a student update, designed to provide feedback on how the approach taken by the user has impacted upon a particular targeted student. All student updates provide three forms of feedback: facial expressions; a rating scale based upon the NSW Quality Teaching Model and expert commentary.

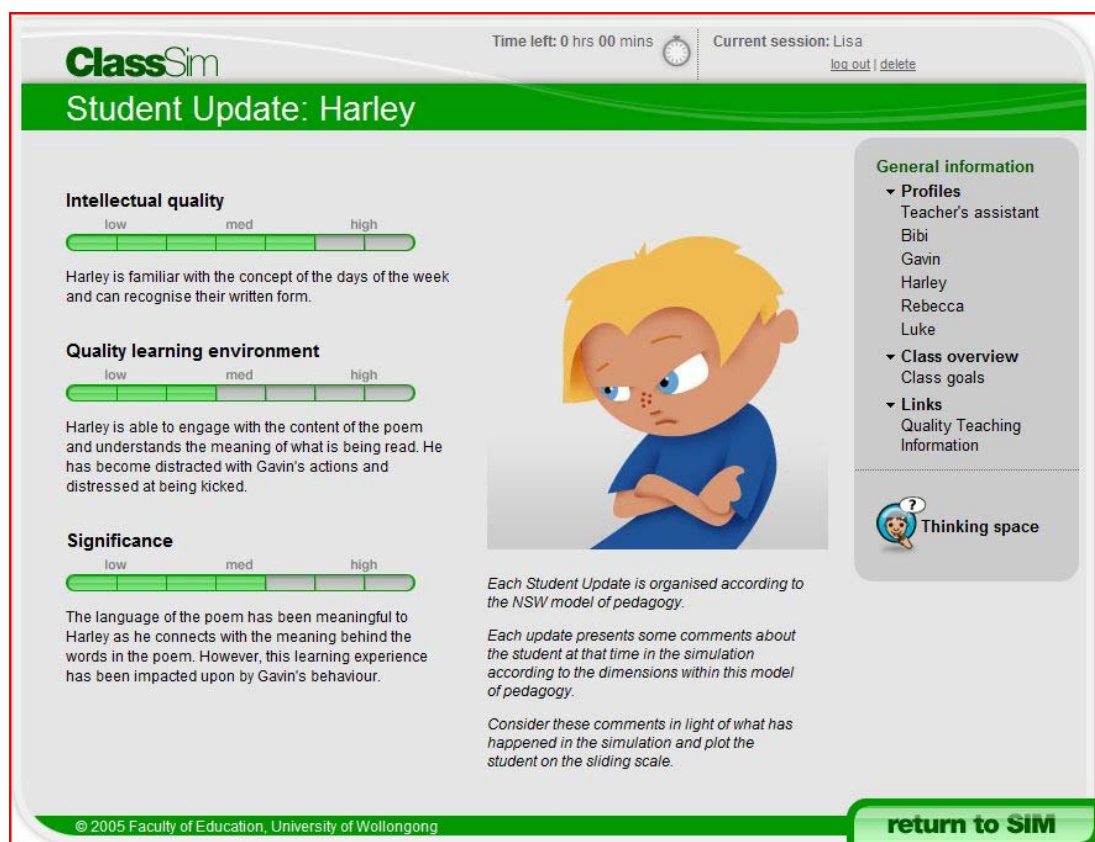


Figure 1.1: ‘Student Update’ of Harley

An embedded cognitive tool called the ‘Thinking Space’ provides a framework in which the user can reflect upon issues within the virtual classroom, articulate their rationale at decision points, identify underlying influences that affect their use of the virtual learning environment, and keep a record of their professional learning as they engage with the support material. Figure 1.2 shows a screen capture of the ‘Thinking Space’ tool. Key questions and prompts are provided to support users as they articulate, justify and reflect on the decisions they make.

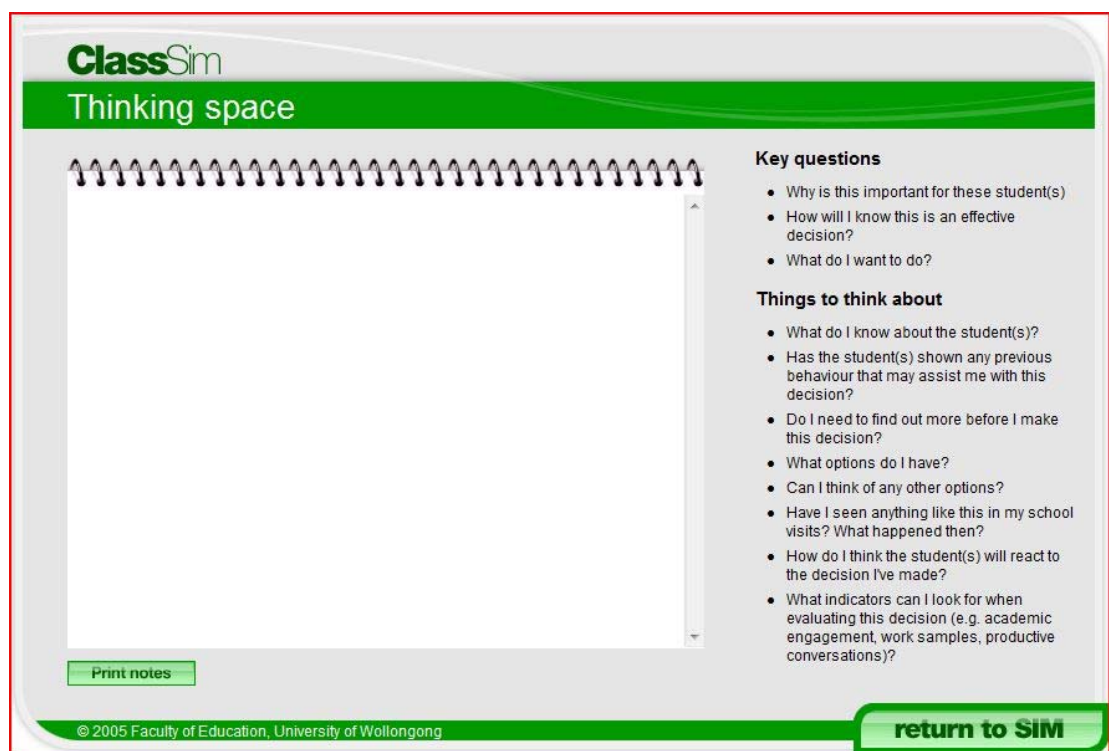


Figure 1.2: ‘Thinking Space’

Support materials are available at differing times, dealing with a wide range of topics referred to throughout the simulation. Summaries include links to websites, textbook references and other literature. The summaries include information about a number of teaching strategies, classroom management techniques and professional terminology used throughout the simulation. The support materials were incorporated into the design of the virtual learning environment to inform and support the pre-service teachers in making connections between the theory and the practice of teaching as they make

decisions within the simulation. Figure 1.3 provides an example of support material found within ClassSim.

The screenshot shows a web page from ClassSim. At the top, the 'ClassSim' logo is in green. Below it, a green banner contains the title 'Parent helpers in the classroom' in white. The main content area is light gray and contains the following text:

Parents can be incorporated into the classroom to support learning and teaching experiences. This can be done in a number of ways.

- Drawing upon the expertise of parents - the skills, talents and interests of individual parents
- Having parents assist the classroom teacher in managing the learning experiences of the students
- Training parents to work with individual students under teacher direction

Parents have valuable skills to offer children to help their education. Parents should be encouraged to take an active part in their child's education. One way this can happen is by including them in classroom activities.

Parents can be of assistance listening to children reading, facilitating small group work, working individually with children experiencing difficulties / gifted children, supervision of computer work, and general assistance in the classroom (displays etc).

It is important that parents are trained by the classroom teacher to ensure consistency with instructions and to ensure expectations from both the teacher and parent helpers are met. Communication between the teacher and the parent helpers is vital.

This weblink has some further ideas about how parent helpers can be used in the classroom.

<http://teachingheart.net/parenthelpers.html>

Additional information about the involvement of parents within the classroom can be found in:

Marsh, C. (2000) Handbook for beginning teachers (2nd ed). Longman, pages 221-238

At the bottom, a green bar contains the copyright notice '© 2005 Faculty of Education, University of Wollongong' on the left and a 'return to SIM' button on the right.

Figure 1.3: Summary of Parent Helpers in the Classroom.

Throughout the running time of ClassSim the user encounters a number of decision-making opportunities. These are concerned with classroom management, student behaviour, and teaching and learning decisions. When these occur the user is asked to select from various options in order to proceed with the program often requiring them to draw upon their theoretical knowledge to identify solutions to resolve problems. Further, the user can slow down or accelerate classroom events, revisit and reflect on critical decision points and replay events in the light of new understanding.

## Rationale for using ClassSim

As previously discussed, there have been a number of concerns about declining teaching standards reported in recent teacher education reviews (CDEST, 2002; Education & Chapter One

Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). These reviews have suggested improvements be made to current teacher education degrees highlighting the need to increase both the quality and quantity of field experiences and the lack of connection between the theory of pre-service teacher education and field experience. These will now be discussed in relation to why ClassSim was used within this inquiry.

### **Supplementing Field Experiences**

Experience in the field has been noted as an essential component of teacher education programs (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). This was further highlighted in 2005 when the Education and Training Committee recommended that the number of pre-service teacher field experience days be increased from 60 days to 130 days. Although this recommendation was made, a number of limitations (previously discussed) have been identified including unclear expectations and limited commitment by schools, uneven quality of supervision, lack of time and a lack of funding to address these needs (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). Therefore the use of a virtual learning environment was proposed as a way to overcome many of these limitations as ClassSim required no additional funding or school commitment and the pre-service teachers had unlimited access to ClassSim throughout their degree.

### **Improving the Theory to Practice Connection**

Achieving an appropriate balance between the theoretical and practical components of teacher education is one of the most important challenges currently facing those involved in the design, delivery and accreditation of teacher education (CDEST, 2002;



Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). Further, reviews of teacher education suggest that initial teacher education programs need to facilitate the development of connections between practical teaching skills and theoretical subject content. Constructivist learning theorists such as Vygotsky believe that learners need context within which to explore, discover, communicate, practice, and create their own understandings of complex phenomena (Kaufman & Sauve, 2004). Further, the literature suggests that the skills that are acquired during engagement with a virtual learning environment can transfer to real-life situations (Aldrich, 2004; Doyle, 2002; Gatto, 1993; Jonassen, 2000) as the learning environment provides the learner with “practice of the behaviour he/she will be called upon to exhibit in reality” (Gatto, 1993:144). Virtual learning environments, such as ClassSim have the potential to provide a supportive environment in which a pre-service teacher can explore possible scenarios using the theory of their training in practical situations and construct their own understanding of teaching through the virtual experience.

Criticos (1993:162) explains that experience itself is not valuable; rather, “what is valuable is the intellectual growth that follows the process of reflecting on experience”. Further, it is believed that reflection is an essential aspect of an effective learning experience for adults (Knowles, Holton and Swanson, 1998), as adult learners need time to contemplate the ramifications of the learning experience to their experience and responsibilities. Herrington, Oliver and Reeves (2003:63) suggest that activities within a virtual learning environment, such a simulation, need to enable learners to “reflect on their learning both individually and socially”. Furthermore, Mezirow (1991:6) states that, “reflective learning involves assessment or reassessment of assumptions”. As such, reflective learning activities can assist users to examine their bias and prior assumptions and make connections between the theory and their experience, and thus move them toward a new understanding of the information presented. As such ClassSim was designed with a reflective space carefully scaffolded to include prompts and discussion points, which is consistently available (and is re-accessible at any time after the user has engaged with the environment). Thus pre-service teachers who engage with a virtual learning environment such as ClassSim during their pre-service education may be better

equipped to transfer the knowledge and skills acquired during their pre-service training to real life classrooms.

## **Purpose Statement and Research Questions**

The purpose of this inquiry was to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation, ClassSim, to link knowledge from university coursework with field experience, and in particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identity.

The inquiry was guided by one broad research question:

How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?

In understanding how the virtual learning environment of ClassSim contributes to pre-service teacher learning, three sub-questions were developed to further frame the inquiry. The first sub-question aimed at understanding what connections the pre-service participants were able to make between their university-based curriculum and their in-school experiences.

- *What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?*

The second sub-question examined the design capabilities of ClassSim and how these can be utilised to best meet the needs of the adult learner.

- *In what ways can the virtual environment of ClassSim support the principles of adult learning?*

The final sub-question was designed to explore how engagement with ClassSim can contribute to the adult learners' professional identity.

- *In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?*

In examining how the virtual leaning environment contributes to the learning of the pre-service teachers, it is important that the adult learner, rather than the virtual learning environment, be the focus of the inquiry. Andragogy (Knowles, 1980) provides a framework in which the learning of the adult participants can be reviewed and assumptions about their learning drawn.

## **Theoretical Perspective**

The theoretical perspective adopted during this inquiry is based upon the theory of andragogy (adult learning theory). Andragogy first appeared in the writing of Alexander Kapp, a German grammar teacher in 1833, who used it to describe Plato's educational theory (Knowles, Holton & Swanson 1998:59). The term 'andragogy' did not take popular hold and fell into disuse until a century later, when in 1921 another German Social Scientist, Eugen Rosenstock claimed that "adult education required special teachers, special methods, and a special philosophy" (Knowles, Holton & Swanson 1998:59). In 1926, Eduard Lindeman published a book entitled, *'The Meaning of Adult Education'*, in which he laid the foundation for a systematic theory about adult learning.

It was Malcolm Knowles who popularised the European concept in 1968, when he contrasted pedagogy with the concept of andragogy, meaning "the art and science of helping adults learn" (Knowles, 1980:43). Knowles' original studies and writings arose from the assumption that there are significant, identifiable differences between adult learners and learners under the age of eighteen. Primarily, the differences, according to Knowles, relate to an adult learner being more self-directing, having a repertoire of experience, and being intrinsically motivated to learn subject matter that can be applied

immediately – learning that is especially “closely related to the developmental tasks of his or her social role” (Merriam & Caffarella, 1999:272).

Adult learning is influenced by the five main principles of andragogy. These include ‘Readiness’, ‘Orientation’, ‘Motivation’, ‘Experience’ and ‘Self Concept’, all of which are interrelated. These assumptions work together to account for how and why an adult learner acquires new information. In this inquiry, the five principles of andragogy work together to explain the learning of the pre-service teachers and how this learning relates to their engagement with ClassSim, the virtual learning environment, their university coursework, field experiences, previous life experiences and other factors identified by the participants that may influence their learning.

Within the ‘Self Concept’ principle of andragogy, the adult learner’s professional identity comes into focus. The developing professional identity of pre-service teachers is a key component of this inquiry. The principle of ‘Self Concept’ examines the level of control the adult learner asserts over the what, who, how, why, when and where of their learning and how they view themselves as professionals. Professional identity may be described as the fostering of “self descriptions” (Winslade, 202:35), which are confirmed by the social and cultural norms within their context (Winslade, Crocket, Monk & Drewery, 2000). This notion of a “socially constructed identity” (De Ruyter & Conroy, 2002:11) is relevant for pre-service teachers, as the context within which professional identity emerges, changes from one practical setting to another as each field experience placement can differ widely (Cattley, 2007). The construct of identity becomes a partnership between the social and the individual person within the domain of teaching. Emphasis is placed upon the importance of knowing who you are and what you believe as a teacher. Korthagen (1999 & 2001) suggested a philosophy of reflective practice to aid pre-service teachers articulate the theory to practice relationship and thus build stronger connections between the theory of their pre-service teacher education and the practicalities of a classroom, and thus build a better understanding of themselves as teachers. Therefore, teachers’ professional identities are shaped by their understanding of the theory of teaching/learning, their field experiences and how they view themselves as professionals. Thus, adult learners are expected to develop their professional identity

via university coursework (theory), field experience (practice), and most importantly, through the reflections on the connections they make between theory and practice.

## **Research Strategy and Rationale**

This inquiry is qualitative in design working within the interpretivist paradigm. Within the interpretivist paradigm, this research can be explained as a comparative case analysis. A qualitative design in the form of comparative case analysis was most suited to this inquiry as the outcome was to provide a detailed description of how the virtual learning environment contributes to the learning of pre-service teachers - ‘thick description’ (Lincoln & Guba, 1985). Lincoln and Guba (1985:120) provide further justification to support the selection of a qualitative approach in this inquiry;

If you want people to understand better than they otherwise might, provide them information in the form in which they usually experience it. They will be able, both tacitly and propositionally, to derive naturalistic generalizations that will prove to be useful extensions of their understandings.

As the purpose of the inquiry was to investigate how pre-service teachers make use of ClassSim to link the knowledge acquired from university coursework with field experiences, a comparative case analysis was adopted as it allowed for an in-depth comparison of two cohorts of pre-service teachers (first and third year) as they interacted with ClassSim within the one university.

## **Context of the Inquiry**

In this section the setting and participants involved in this study are described and explained.

## **Faculty of Education**

The Faculty of Education (University of Wollongong) was formed in 1984 from the amalgamation of the former Department of Education of the Faculty of Arts of the University of Wollongong, and the nearby School of Education (Institute of Education). Since its formation, the total annual enrolment of undergraduate and postgraduate students in this faculty has grown to approximately fourteen hundred students. The areas of pre-service teacher education include Early Childhood, Primary, Secondary, and Physical & Health Education, all of which are required to provide for their students sixty days of practice teaching throughout the duration of their degrees ([www.uow.edu.au/educ/](http://www.uow.edu.au/educ/)).

## **Bachelor of Teaching**

At the time of this inquiry, the Bachelor of Teaching degree could be completed over a three-year period (full time). Each year, two semesters are offered (autumn and spring) during which a full-time student can study up to four subjects per semester. At the time of the inquiry, all pre-service teachers were required to complete sixty days of supervised practice at assigned schools (field experience). Successful completion of this three-year degree qualifies the participant to teach in a NSW primary (elementary) school. Upon completion of a Bachelor of Teaching degree, participants are eligible to apply to complete the Bachelor of Education (Primary) or apply for Bachelor of Education (Honours) degree. Both Bachelor of Education degrees are recognised as an 'add-on' fourth year qualification and enable the graduate to teach in most other Australian states and overseas ([www.uow.edu.au/educ/](http://www.uow.edu.au/educ/)).

## **Professional Practice**

'Professional Practice' is a compulsory strand of subjects for first, second and third year pre-service teachers enrolled in the Bachelor of Teaching (in both Primary and Early Childhood degree structures). The first year 'Professional Practice' subject was

developed with the aim of assisting students to develop an understanding of learning and teaching as an interactive process within a classroom setting. Pre-service teachers were introduced to essential curriculum concepts, classroom management strategies and student welfare issues. The subject guided pre-service teachers in lesson planning and encouraged reflective practice. Pre-service teachers observe a range of demonstration lessons at local demonstration primary schools and apply their knowledge and skills in scheduled microteaching situations. The pre-service teachers also complete ten days of practice teaching at an assigned school. These ten days constitute the first year field experience. This inquiry was conducted with a cohort of ten first year pre-service teachers enrolled in 'Professional Practice'. This cohort constituted the first year case.

The third year 'Professional Practice' subject was developed to extend the third year field experience by integrating the knowledge of curriculum planning, the ability to develop a situational analysis of a school and class, and the preparation of a teaching program across the Key Learning Areas (KLAs). During this subject the third year pre-service teachers develop a five week teaching program and implement it during field experience. This task was designed for the pre-service teachers to demonstrate increased understanding of the state and school curricula, equity perspectives, teaching and learning strategies, and assessment components. Reflection was a major pedagogical underpinning of this course as it is believed that reflection maximises the opportunity to learn the skills of teaching and gain other understandings of education during the professional experience. This inquiry was conducted with a cohort of seven third-year pre-service teachers enrolled in 'Professional Practice'. This cohort constituted the third-year case.

These cohorts were chosen as the quality and quantity of experience and knowledge of each cohort were a contributing factor to their understanding of their role as a teacher and the development of their professional identity. Thus, by sampling both the first and final year cohorts these factors were taken into consideration which thus enabled a comparative case analysis.

## **Significance of the Inquiry**

This research inquiry is significant for the following reasons:

1. It addresses a gap in the literature. There is minimal research available that explores the use of simulations in pre-service teacher education and how engagement with simulations can support the learning of pre-service teachers. A particular focus was on how a simulation can aid pre-service teachers in making connections between the theory of their pre-service teacher education and their field experience and how experience with simulations can contribute to the development of pre-service teachers' emerging professional identity. Therefore, this inquiry contributes to the body of literature in the field of educational technology, theory to practice connections and teacher professional identity.
2. The findings of this inquiry can potentially contribute to current pre-service teacher education models through the incorporation of an innovative way to aid pre-service teachers in making connections between theory and practice.
3. The findings from this inquiry contribute to the knowledge base of andragogy and virtual learning environments and are intended to be used as a foundation from which more sophisticated models can be produced as new interpretations emerge.

## **Limitations of the Inquiry**

The limitations of this inquiry are as follows:

1. This inquiry is limited to adult learners from one university enrolled in an undergraduate degree that engaged with the virtual learning environment provided by ClassSim as part of their subject requirements. Thus, while the research strategy employed may be applicable in other contexts and some of the findings may be transferable to other contexts, specific findings may be unique to the environment studied.



2. This research inquiry constitutes an interpretation. It is a reconstruction of what occurred in an undergraduate subject based on the researcher's selected data-collection procedures and the participants' responses to these. The outcome of the study was to provide further understanding to inform pedagogical innovation, not to control or predict.
3. The data-collection procedures utilised during this inquiry have a number of limitations. These limitations are summarised in Table 1.1. Literature has been drawn upon to explain these limitations further with regard to this inquiry.

<b>Data Collection Procedure</b>	<b>Limitations</b>
Observations	<ul style="list-style-type: none"> <li>- Researcher as instrument of data collection. Concern for possible bias of what is recorded during observations (observation may reflect researcher's beliefs rather than an accurate depiction of setting) (Bogdan &amp; Biklen, 1998; Mertens, 1998).</li> <li>- A setting can never be completely captured during observations (Bogdan &amp; Biklen, 1998; Flick, 1998).</li> </ul>
Artefacts	<ul style="list-style-type: none"> <li>- 'Thinking Space' entries and field experience reflections may be incomplete.</li> </ul>
Interviews	<ul style="list-style-type: none"> <li>- Semi-structured interviews may be difficult to compare as there is no set line of questioning (Burns, 2000).</li> <li>- Use of a tape recorder may inhibit participant responses (May, 2001).</li> </ul>

Table 1.1: Limitations of Data-Collection Procedures

## **Definition of Terms**

### **Virtual Learning Environment**

In the educational community the term ‘virtual learning environment’ is generally used in relation to web-based learning resources. These environments typically consist of pages of text and 2D graphics (that may represent 2D or 3D environments) and are supplemented by communication tools. Wilson (1997:1057) defines a virtual environment as “an environment other than the one in which the participant is actually present”, and then suggests that a more useful definition is that “it is a computer-generated model, where the participant can interact intuitively in real time with the environment or objects within it, and to some extent has a feeling of actually ‘being there’, or a feeling of presence” (Wilson, 1997:1057-1058). Wilson, Foreman, and Tlauka (1997:526) note that there are two principal features of a virtual environment: the user’s ability to interact with objects within the environment; and the user’s ability to have some control on the viewpoint taken within the environment. As the focus of the study is of a web-based learning environment, in which the user can take some control in their experimentation with decision-making opportunities, it seems appropriate to use the term ‘virtual learning environment’ to describe the overall learning environment.

### **Simulations**

Typically a simulation is defined as an interactive, representational environment that can provide effective learning experiences that require learners to construct their knowledge actively (Aldrich, 2004). Furthermore Doyle (2002:1) describes simulations as an “artificial representation of a complex real-world process with sufficient fidelity to achieve a particular objective, usually for the purposes of training or performance testing”. Simulations can be presented in a number of ways including role-plays (or scenarios), games and computer programs and have the potential to encourage the users to become active participants in their learning and think more deeply about decisions made (Conrick, Dunne & Skinner, 1997). Overall, simulations provide a realistic

context in which a learner is able to explore and experiment within the environment, and allow the user to see the consequences of their experimentation.

## **Cognitive Tools**

Kozma (1987:21) stated that, “cognitive tools are devices that allow and encourage learners to manipulate their thinking and ideas”. According to this definition cognitive tools include, but are not limited to, calculators, semantic networks, computer conferencing, and tool-based software (such as spreadsheets, databases, and multimedia software). Jonassen (2000:9) defined ‘mindtools’ as computer-based tools that have been “adapted or developed to function as intellectual partners with the learner in order to engage and facilitate critical thinking and higher-order learning”. A number of theoretical reasons for the use of ‘mindtools’ include: they foster meaningful learning; assist in knowledge construction; facilitate reflective thinking; provide cognitive partnerships; and they scaffold thinking (Jonassen, 2000:11-13). Although distinctions between ‘mindtools’ and cognitive tools appears to be unclear, Kommers, Jonassen and Mayes (1992) suggest that a ‘mindtool’ is a computer tool intended to engage and facilitate the cognitive processes, whereas cognitive tools are both mental and computational devices that support, guide, and extend the thinking processes of their users (Derry, 1990). Jonassen (1996) explained that cognitive tools that function as mindtools are those that engage the learner in higher order thinking skills such as critical, creative and complex thinking. Thus, cognitive tools are defined as “generalisable tools that can facilitate cognitive processing” (Jonassen, 1992a:2). Although cognitive tools may facilitate the learners in processing information, their main goal is to “make effective use of the mental efforts of the learner” (Jonassen, 1996:10). As the focus of this inquiry is not simply on the embedded thinking tools within the virtual learning environment of the ClassSim, but rather on how the pre-service teachers use these tools (such as the ‘Thinking Space’ and ‘Student Updates’) to support, guide and extend their pre-service teacher training, the term cognitive tools will be used, as opposed to ‘mindtools’.

## **Professional Identity**

What constitutes a professional identity in teaching is difficult to define. Sachs (1999) explained that teachers may inhabit multiple professional identities. Primary school teachers may take on the general identity of a primary teacher; however “this can be broken down into further identities by year level, such as a junior, middle or upper school teacher; a subject or discipline specific teacher such as special education teacher, music teacher, physical education teacher and so on. These people may see themselves as belonging to the generic category of a primary teacher but also identify with their area of specialisation and year level” (Sachs, 1999:5). Professional identity thus provides a shared set of characteristics and values that allow for differentiation from one group to another. Overall, one’s professional identity can be explained by Epstein (1978) when he stated, “It represents the process by which the person seeks to integrate his various statuses and roles, as well as his diverse experiences, into a coherent image of self” (Epstein, 1978:101). Beijaard, Meijer and Verloop (2004) suggest that professional identity development is an ongoing process that involves the interpretation and reinterpretation of experiences. Similarly Flores and Day (2006:220) defined the development of a teacher’s professional development as “an ongoing and dynamic process which entails the making sense and (re)interpretation of one’s own values and experiences”. Therefore, teacher identity formation is a dynamic and active process guided by the pre-service teacher’s prior life experiences, pre-service teacher education, and context. In regards to this inquiry, the term professional identity will be used to describe the pre-service teachers’ emerging knowledge about content, learning, teaching and understanding of the role as a professional.

## **Structure of the Remainder of the Thesis**

### **Chapter Two – Literature Review**

Chapter two presents an overview of the literature significant to this inquiry. The review consists of three sections. The first section examines the pre-service teacher education and its relationship with beginning-teacher transition and adjustment. The second section discusses the relationship between pre-service teacher education and the development of a professional identity. The final section of the review presents the argument that more research is needed in the use of simulations to enhance teacher education programs.

### **Chapter Three – Methodology and Research Design**

Chapter three presents the methodology and research design of this inquiry. It begins with a discussion of the theoretical background of the design and methods selected for this study. Specific aspects of the research method that are discussed include the use of the method in the literature, data collection procedures such as semi-structured interviewing, observations and artefact collection, and the data-analytical framework for the inquiry. These topics are discussed in considerable detail to be consistent with the assumptions of qualitative research. Furthermore, the research process is outlined encompassing the phases of data collection, data analysis and quality data checks.

### **Chapter Four – The Process of Preparing Data for Cross-Case Analysis: Andragogy as the Theoretical Frame**

Chapter four outlines how the collected data were transformed into two case studies (first and final year pre-service teachers) and compared under the assumptions of andragogy. The chapter illustrates how the five assumptions of andragogy work together to explain the learning of the pre-service teachers and how this learning relates to their

engagement with the virtual learning environment provided by ClassSim, their university coursework, field experiences, previous experiences, and other factors identified by the participants that may influence their learning. Two examples of analysed data were presented for each of the five assumptions, to outline how the researcher identified and interpreted the data in relation to the assumptions of andragogy.

### **Chapter Five – First-Year Pre-service Teacher Case**

Chapter five communicates the findings of the first-year participant pre-service teacher case. The chapter is divided into three sections. The first section provides the contextual background of the first-year case. The second section discusses the findings that emerged, organised under the principles of andragogy. The third section details a summary of the first-year pre-service teachers as a case.

### **Chapter Six – Third-Year Pre-service Teacher Case**

Chapter six presents the findings of the third-year participant pre-service teacher case. This chapter is divided into three sections. The first section provides the contextual background of the third-year case. The second section discusses the findings that emerged, organised under the principles of andragogy. The third section details a summary of the third-year pre-service teachers as a case.

### **Chapter Seven – Comparison of Cases**

Comparative analyses of both the first and third-year pre-service teachers are presented in this chapter. An interpretative summary runs through chapter seven as the cases are compared.

## **Chapter Eight – Discussion and Conclusion**

Chapter eight responds to the research questions that framed the inquiry. Implications of the findings are also presented, drawing upon supporting literature.

# Chapter Two

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### Introduction

This chapter presents an overview of literature significant to this inquiry. The review consists of two sections. The first section, focused on pre-service teacher education, builds upon discussion of reviews presented in chapter one and contains three major areas for discussion:

- The impact of pre-service teacher education on beginning-teacher transition into school settings
- The impact of pre-service teacher education on the development of a professional identity
- Some alternative pre-service teacher programs designed to facilitate beginning-teacher transition into schools and the development of professional identity.

The second section of the review, focuses on simulations, describes various applications of simulation technology in a range of settings and presents an argument for more research into the use of simulations in teacher education programs to enhance the process of transition into school settings and the development of a professional identity. Figure 2.1 presents a model of the literature review indicating how each section informed the other.

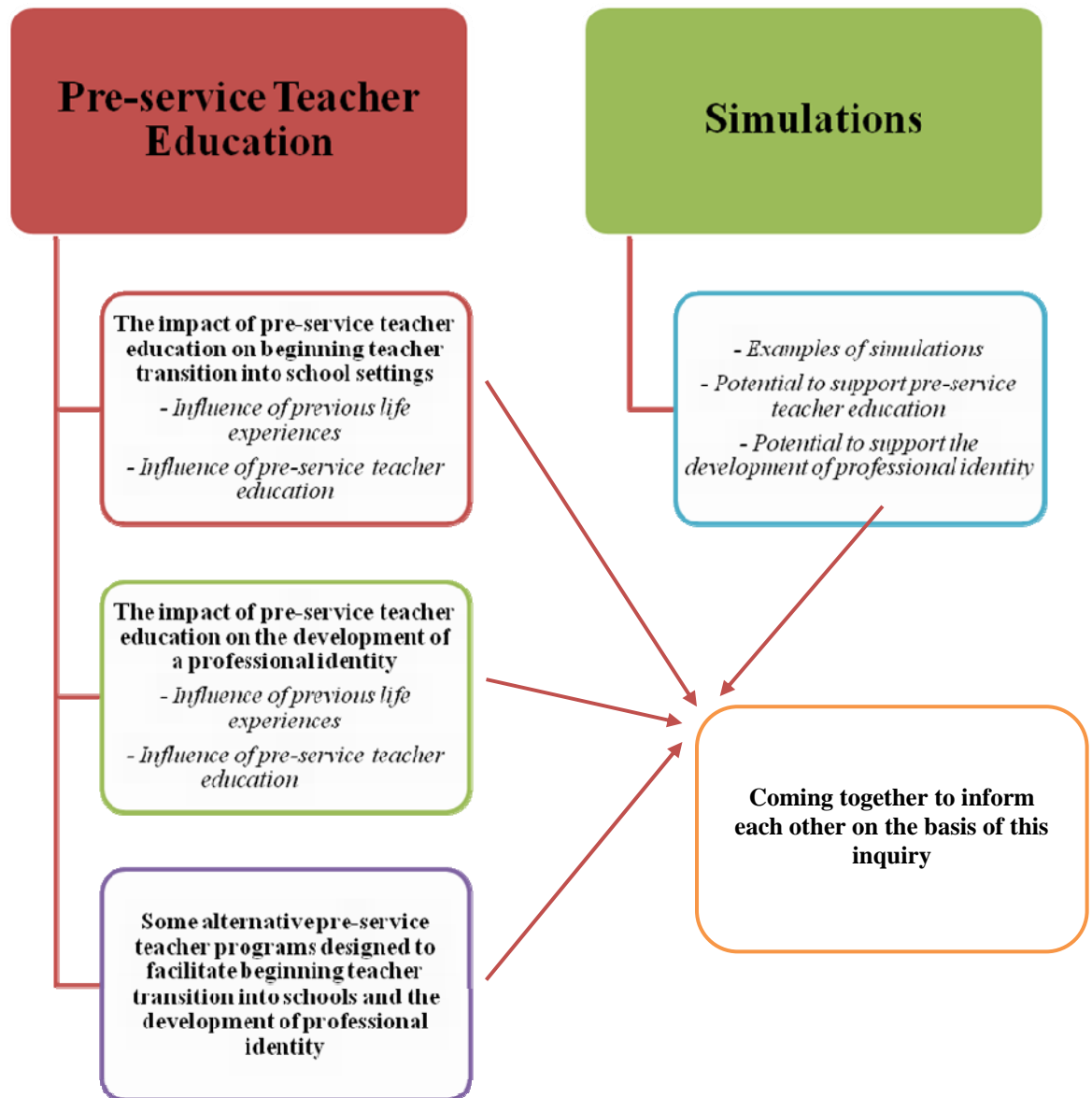


Figure 2.1: Model of Literature Review

There have been a large number of reviews on pre-service teacher education in recent times. The reviews have ranged from the more common short, small-scale studies, to the larger and longer-time-frame studies. Issues identified within these reviews have been described in chapter one. Cochran-Smith and Zeichner (2005) suggest that the lack of any meaningful follow-up that has resulted from these reviews may be an indicator of the low priority given to teacher education research by funding agencies. During this study, the researcher was mindful of these criticisms and made every effort to select

literature that was relevant to the focus of this inquiry. Relevant conceptual work, official papers, and guidelines were included, but studies that were not empirically-based were excluded.

## **Pre-service Teacher Education as a form of Adult Education**

In Australia, pre-service teachers are enrolled in a tertiary bachelor degree at a university. In 2006, the Department of Education, Science and Training conducted a survey of final-year teacher education students and found that the ages ranged between 20 and 60 years, with more than half of the total respondents aged between 20 and 24 (DEST, 2006:3). The participants of this inquiry had a similar age range.

University students are considered adults by Australian law (over 18 years of age). As adult learners they are more likely to be self-motivated (evident in their enrolment in further education) and usually they enter an educational setting with more extensive life experience than children (Knowles, 1975 & 1984); and therefore require different methods of teaching/facilitating when in a learning situation (Knowles, 1984; O'Neil & McMahon, 2005). The distinction Knowles (1970) made between how adults and children learn was an important landmark in teaching and learning practices in vocational education and training, and in higher education. Knowles, Holton and Swanson (1998) suggested that andragogy is a way in which educators can professionally guide adult learners with the ultimate aim being to facilitate change in an adult person (Knowles, Holton & Swanson, 1998:60). In this inquiry, andragogy provided a framework in which the learning of the pre-service teacher participants was reviewed and assumptions about their learning drawn. Andragogy is based on five principles of the adult learner, including 'Self-Concept', 'Experience', 'Readiness', 'Orientation' and 'Motivation'. This framework (andragogy) is discussed in more detail in chapter four of this thesis.

## **Pre-service Teacher Education**

During the last decade there has been an increased interest internationally in the assessment and accreditation of teacher education programs. The Organisation for Economic Cooperation and Development (OECD, 2005) recently conducted a review of teacher education over twenty-five countries (including Australia) entitled, '*Teachers matter: attracting, developing and retaining effective teachers*'. The review revealed that not only was teacher education high on the agenda for many of the countries, it suggested that accreditation procedures are a means by which policy makers can encourage improvement in teacher education.

### **Pre-service Teacher Education in Australia**

A number of reviews of teacher education have been conducted over the past decade in response to concerns over declining teacher standards. In 2006, Teaching Australia commissioned a study of the current procedures for the assessment and accreditation of teacher education courses (Ingvarson, Elliott, Kleinhenz & McKenzie, 2006). The study revealed that the procedures did not provide quality assurance as the pre-service teacher education courses were more likely to have a focus on the inputs of the course, rather than the outcomes. As such, teacher education courses typically focus on the content of the course rather than how effectively the course prepared pre-service teachers for their future career as a teacher. The findings also suggest that none of the pre-service teacher education courses utilises a common measure of quality in regards to the competencies of graduates. The most recent review, conducted by the House of Representatives Standing Committee on Education and Vocational Training (2007:xv), called for a more systematic method for gathering data about the outcomes of teacher education courses. The review found that there are over two hundred teacher education courses in Australia, yet there are very few published studies of the relative effectiveness of these courses in the preparation of teachers in relation to their first placement in a school setting. The report highlighted the need for a comparable, standard-based measure of outcomes of these pre-service teacher education courses.

Recent reviews have recognised the need to reliably measure teacher competencies. Further, the majority of reviews consistently identify the quality of practicum experiences and the transferability of university coursework and the lack of connection between the theory of pre-service training and practical experiences as areas that need to be improved (Commonwealth Department of Education, Science and Training, 2002; Education and Training Committee (Victoria), 2005; Ministerial Advisory Council on the Quality of Teaching, 1998; NSW/ACT Independent Education Union, 2000; & Ramsey, 2000). Blackwell, Futrell, and Imig (2003:360) outlined the findings of these review as follows:

- “Graduates leaving training with an inadequate or weak knowledge base and the inability to aggress on a professional knowledge base;
- Research that is related to academic discipline issues, rather than focusing on schooling, teaching and learning generally;
- Failure to engage in the reform of teacher education in significant ways;
- Faulty structural designs, including courses separated from school experience and insufficient time to learn about student learning; and
- Courses that lack relevance to the real work of teachers.”

### **Recent Responses to the Reviews in Australia**

These reviews, and discussions by state and federal ministers regarding teacher shortages, led the federal government to nominate teacher education as an area of national priority. However, this did not lead to increased investment in teacher education; rather, the federal government imposed a cap on student fees, to attract more candidates into teacher education (Brennan & Willis, 2008:299). In addition, the May 2007 budget did designate an increase of \$450 per student for teacher education – to be organised through the schools division of the central government department, rather than through higher education allocation. This increase was to be used for more practicum placement days, and to literacy and numeracy testing of student teachers to meet (as yet unspecified) standards (ACDE, 2007). Another area of federal intervention in Australian teacher education was in designing a national approach to accreditation of

teacher education programs. Until very recently, teachers who qualified in different states or territories in Australia did not have a mutually-recognised qualification; rather, there was only a policy of mutual acknowledgment of teacher registration. However, with increasing demographic mobility, national accreditation of teacher education certifications is seen as advantageous and is currently in development.

The Australian Council of Deans of Education (ACDE) have criticised the federal government's initiative, as the proposed increase of funding for teacher education students was decreased to only \$394 per student in 2008 and was proposed to be as low as \$300 per student in 2009 (ACDE, 2009). Further they recommend that the Commonwealth government "commission an examination of the cost of providing practicum and increase the amount of the loading for practicum to fully reflect its costs" (ACDE, 2009:1).

This literature review will now examine the impact of pre-service teacher education on the transition of beginning teachers into full-time and part-time work.

### **The Problem of Linking Theory to Practice**

The Educational Training Committee (2005) findings suggested that achieving the right balance between the theoretical and practical components of teacher education is one of the most important challenges currently facing those involved in the design and delivery of pre-service teacher education. This was also reflected in the findings of the review completed by the Ministerial Advisory Council on the Quality of Teaching (1998), which suggested that initial teacher education should have stronger links between field experience and on-campus learning and these links be made more explicit in pre-service teacher education. Furthermore, pre-service teachers often report experiencing problems understanding the relationship between 'theory' and 'practice' in teacher education (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). Korthagen and Kessels (1999:5) have suggested that there are three major causes for this lack of

connection between the theory of teacher education and teaching practice. These include;

1. Pre-service teacher prior experience;
2. A 'feed-forward problem'; and
3. The nature of relevant knowledge.

Korthagen and Kessels (1999:4) explain that a pre-service teacher may have preconceptions about learning and teaching and these notions often do not agree with the theories taught in teacher education. This view is similar to the view held by Lortie (1975) who explained this phenomenon as an 'apprenticeship of observation' (Lortie, 1975:61), where pre-service teachers have been a student for a long period of time (the 12 to 15 years they spend as pupils), and as a result they develop preconceptions of teaching from observing teaching throughout their own schooling. Another fundamental cause of the transfer problem has been described as a 'feed-forward problem'. Korthagen and Kessels (1999:4) explain that;

In order to learn anything during teacher education, student teachers must have personal concerns about teaching or they must have encountered concrete problems. Otherwise the fruitfulness of the theory is not clear to them and they are not motivated to study it.

The third and final cause for the lack of connection between theory and practice, as suggested by Korthagen and Kessels (1999) is the nature of relevant knowledge. This involves the belief that teachers require concrete answers to situations in which they have little time to think and plan. Further they explain that "this type of action-guiding knowledge is rather different from the more abstract, systematized and general expert-knowledge that teacher educators often present to student teachers" (Korthagen & Kessels, 1999:4).

### **The Impact of Pre-service Teacher Education on Beginning-Teacher Transition into the School Setting**

For many years studies and reviews have reported that the first year of teaching is a time of considerable change and challenge for new graduates as they move from the role of

pre-service teacher to that of teacher (Corcoran, 1981). Veenman (1984), in his study of perceived problems of beginning teachers, identified eight common issues beginning teachers faced, including classroom discipline, motivating students, dealing with individual differences, assessing students' work, relationships with parents, organisation of class work, insufficient and/or inadequate teaching materials and supplies, and dealing with problems of individual students. Although Veenman's study was conducted in 1984, the literature suggests that little has changed 25 years later (see for example O'Brien & Goddard, 2006). Further, Veenman (1984:11) suggested that many new teachers undergo what he refers to as a 'reality shock', which is "the collapse of missionary ideals formed during teacher training by the harsh and rude realities of everyday classroom life". This view is supported by Gold's (1996) review on teacher induction that suggested that pre-service teachers often begin their careers with a lack of ability to cope with the everyday pressures of teaching, resulting in feelings of disillusionment. Wideen, Mayer-Smith and Moon's (1998) analysis of seven longitudinal studies of first-year teachers concurred with these findings, stating that the first year of teaching is often a culture shock for beginning teachers. In addition a study undertaken by Sellars, McNally and Rowe (1998) commissioned by the Queensland Board of Teacher Registration had similar findings. The purpose of their study was to evaluate and report on beginning teacher induction among other things. They reported that the transition from pre-service teaching to life as a beginning teacher is frequently a challenging and very difficult time often due to a lack of support and resources and issues dealing with classroom management. The Education and Training Committee (2005) concurred with such comments stating that the first year of employment for beginning teachers is often a time of considerable stress and burnout as a result of insufficient resources, substantial teaching loads and little support.

As a result of a number of issues dealing with beginning teacher transition many new teachers leave the profession early in their careers (Berry, 2004; Ewing, 2001; Johnson, 2004; Legislative Council, Standing Committee on Social Issues, 2005; Ramsey, 2000; Vinson, 2002). Bullough, Knowles and Crow (1992) discuss similar findings in their book *'Emerging as a teacher'*. Bullough, Knowles and Crow's study charts the case histories of six beginning teachers during their first year of teaching. Through a combination of interviews and extensive observation, they identified and described



factors in the experiences of pre-service teachers that could make their growth into the role of a fully-fledged teacher easier or more difficult. Their findings revealed that the dropout rate for teachers in the first year is over 30% and that the most able are those most likely to leave teaching. Although this study was conducted almost twenty years ago, these figures are similar to the current teacher education climate (see for example, *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*, OECD, 2005:175 onwards). Further, Bullough, Knowles and Crow identified the more personal dimension of the problem:

This is not only a horrendous waste of time and energy expended to educate short-term teachers, it is in many respects a sad tale of lost opportunities, of insensitivity to suffering, and of intellectual blindness and institutional rigidity (Bullough, Knowles & Crow, 1992:209).

The figures show that 14% of teachers in the United States of America leave the profession before they complete their first year of teaching and 46% leave the system within five years of beginning their teaching careers (National Commission on Teaching and America's Future, 2003:10). In the United Kingdom the figure is 40% within the first five years (Adams, 2002) and in Australia 25% (CDEST, 2002), while researchers such as Gold (1996), and Hunt and Carroll (2003) suggest that 25% of beginning teachers in western democracies do not teach more than two years and that nearly 40% leave in their first five years of teaching. The NSW state government reported that 7.25% of beginning government school teachers left the profession during their first year and 21.14% left teaching in the first five years of teaching (Senate Employment and Training References Committee, 1998:240). These attrition rates in other Australian states and territories, as well as in other parts of the world (Macdonald, 1999) appear to reveal a similar trend (OECD, 2005:171; Ramsey, 2000).

However, beginning teacher transition into the school setting can be supported through school-based experiences, mentoring, and an understanding of the links between the theory of teacher education and its practice. Some alternative models of pre-service teacher education that may support beginning teacher transition will be discussed later in this chapter.

## **Influence of Previous Life Experiences on Beginning Teacher Transition**

There are a number of reasons postulated by researchers for this ‘transition shock’ and subsequent attrition rate. Some researchers argue that they are due to a lack of transference from pre-service teacher education to practice; in particular some view pre-service teacher education as a weak intervention compared with the pre-service teachers’ previous life experiences (Bullough, Knowles & Crow, 1989; Flores, 2001; Lortie, 1975; Mayer, 1999b Rust, 1994). In their study of teacher self-concept and student culture in the first year of teaching, Bullough, Knowles and Crow (1989) identified the key influences on the teaching of three first-year teachers as being their image of themselves and the children they were teaching, as opposed to the pre-service teacher education course they completed. Recent studies and reviews show similar findings (see for example Legislative Council, Standing Committee on Social Issues, 2005; Flores, 2001; Mayer, 1999b). In one longitudinal study of two pre-service teachers, Rust (1994) followed the growth of the pre-service teachers’ views of teaching. Rust (1994) found that their beliefs during their initial pre-service teacher education course was focused on having a child-centred focus, which coincided with their pre-service teacher subject matter, however, once faced with the practicalities of their first teaching position there was a distinct reversal back to their prior beliefs about teaching to a more control-orientated style of teaching. Furthermore, a Portuguese study of fourteen beginning teachers (Flores, 2001) corroborates these findings, stating that pre-service teacher education courses can have a relatively small impact on pre-service teachers when compared to their previous beliefs and experience. Therefore it appears that pre-service teachers often come to teacher education with diverse backgrounds and experiences that direct their expectations about teaching and being a teacher. These issues interact with and filter the knowledge gained throughout their pre-service teacher education but may not be sufficient enough to offset their previous life experiences.

It can be argued one’s beliefs about teaching and learning are well established by the time a pre-service teacher begins formal teacher preparation, and thus they can be resistant to change (Bullough, Knowles & Crow, 1989; Flores, 2001; Hatton, 1998; Lortie, 1975; Mayer, 1999a; Pajares, 1992; Rust, 1994). However, there have been a

number of teacher education models that claim to have successfully addressed this issue and these will be discussed later (see for example Cambourne, Kiggins & Ferry, 2003; Ferfolja, 2008). Lortie (1975), in his study of the power of observation in shaping teachers' practices, claims that teachers teach as they were taught. He suggests that this may be due to the lack of influence of teacher education programs on teachers' beliefs and practices. Lortie (1975:62) also notes that a pre-service teacher's experiences and knowledge about teaching comes from a very limited and "specific vantage point". As an audience of teaching, their involvement in the process of teaching is more likely to be "imaginary rather than real". While students are influenced by some teachers more than others, this is unlikely to be in an analytical way and so what they learn about teaching is likely to be "intuitive and imitative rather than explicit and analytical" (Lortie, 1975:62).

Almost 25 years later, in 1998, Hatton conducted a similar study focusing on the social and cultural influences on teaching. Hatton (1998:7) contended that "one of the most formative experiences on pre-service teachers is anticipatory socialisation for teaching during the 12 to 15 years they spend as pupils in classrooms". She continued by explaining that the reason for the strength of this prior socialization arises because these early experiences are undertaken without relating practice to theory and so their "early unsophisticated learnings about teaching remain intact despite teacher education" (Hatton, 1998:7). Mayer (1999b) in her study on the development of teacher identities and the implications for pre-service teacher education explains that a pre-service teacher's core beliefs of what is teaching is built upon their previous experience. Mayer (1999b) refers to this as their 'apprenticeships of observation' (coined by Lortie, 1975:61) and 'atypical teaching episodes', where the pre-service teacher has been a student for a long period of time and as a result has developed a concept of teaching from observing teaching in their own schooling. Mayer (1999b) describes that the experiences that shape their beliefs about teaching are probably far removed from the realities of teachers' work. She continues by explaining that these experiences however, provide a basis that influences how the pre-service teachers perceive the learning to teach journey once they enter university. Therefore it appears that many of the teaching habits of pre-service teachers have been shaped by their years of schooling and what they regard as the role of a teacher is already firmly ingrained. As a result, this view of

the role of a teacher is often resistant to change during their pre-service teacher education.

If much of a pre-service teacher's beliefs and teaching habits are influenced by their prior experience as a student, these beliefs need to be examined and addressed in order for a smoother transition into beginning teaching. In their review of literature on teacher change, Richardson and Placier (2001) explain that the beliefs pre-service teachers bring to the classroom are often unexamined assumptions that need to be explored and made explicit. Further they suggest that if these beliefs are not addressed, problematic pre-conceptions may be retained throughout their pre-service teacher education, resulting in negative impacts on their beginning teacher transition.

### **Influence of Pre-service Teacher Education on Beginning Teacher Transition**

A number of reviews on Australian teacher education have drawn attention to the lack of transfer of knowledge from pre-service teacher education to teaching practice (CDEST, 2002; Education and Training Committee (Victoria), 2005; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000; OECD, 2005). Some studies suggest that this lack of transfer may contribute to transitional problems (from pre-service teacher to teacher) and high attrition rate of beginning teachers (Graber, 1996; MACQT, 1998; Sorin, 2004). The literature also suggests that pre-service teachers and/or beginning teachers draw upon their 'propositional knowledge' (theory), taught during their pre-service teacher education (Johnston, 1992). Johnston (1992) explains that educational theory taught to teachers is known as 'propositional knowledge' (theory), which is often viewed as being distinct from 'practical knowledge' (related to practice). This assumed difference in knowledge has led to the creation of a theory-practice divide commonly illustrated in teacher education research that investigates pre-service teachers' perceptions of their pre-service teacher education (Graham & Thornley, 2000; Kane, 1995; Tom, 1997) which can have an impact on beginning teacher transition.

Graber (1996:450) noted that the “faculty must recognize that if students are to acquire a non-traditional orientation, curriculum messages must be reinforced and supported in all facets of the programme.” This suggests that traditional models of teacher education in which the university provides the ‘theory’ and the field experience provides the context and practice, may not provide the pre-service teacher with a favourable learning. However, some researchers argue that pre-service teacher education programs can never bridge the preparation-to-practice divide. Northfield and Gunstone (1997), for example, argue that while pre-service teacher education aims to prepare pre-service teachers for the complexity of full-time teaching, this preparation is inevitably inadequate as the program cannot fully create or sustain an environment that mirrors the reality of being a teacher.

Feiman-Nemser (2001a) also criticises the traditional pre-service teacher education programs. She asserts that these programs often assume that learning is largely an additive process and often does not take into consideration the person and setting. In terms of making a difference, she argues that pre-service teacher education programs need to be “organized around an explicit and thoughtful mission and conceptual framework, integrate courses and fieldwork, use student and/or faculty cohorts to intensify the experience, and attend to students’ entering beliefs and their evolving professional identity and practice” (Feiman-Nemser, 2001a:1022). Feiman-Nemser’s explanation of an effective teacher education program shares a number of similarities with Darling-Hammond’s (2006) analysis of powerful teacher education models. In Darling-Hammond’s (2006) analysis of six American pre-service teacher education programs, she identified six common elements of these programs that she believes resulted in the preparation of teachers that are ready to enter the teaching profession with the knowledge and skills needed to teach and learn continuously from their practice. These elements included;

- i. Program coherence based in a common, clear vision of good teaching which is grounded in an understanding of learning that permeates all coursework and field experiences;
- ii. A strong core curriculum taught in the context of practice and grounded in knowledge of child and adolescent development and learning;
- iii. Extensive, connected practicum experiences;

- iv. An inquiry approach that connects theory and practice;
- v. School-university partnerships that develop common knowledge and shared beliefs among school and university-based faculty; and
- vi. Assessment based on professional standards that evaluates teaching through the demonstration of critical skills and abilities.

It is important to note that in Feiman-Nemser's model, there is greater emphasis on the role that the pre-service teachers' beliefs and dispositions play in learning to teach. Overall, both of these researchers criticise the "lack of connective tissue" (Feiman-Nemser, 2001a:1049) between pre-service teacher education and beginning-teacher transition. Thus the traditional pre-service teacher education model is generally designed to be content based with brief periods of field experience of microteaching and field experience (Barnett, Harwood, Keating & Saam, 2002; Fler & Robbins, 2004).

Graham and Thornley (2000) explain that as pre-service teachers identify their views of knowledge acquisition, they "invariably relate theory to the university setting and practice to the school settings" (2000:236). In their study on the use of communication technologies to build a community of practice they suggest that because of this artificial theory-practice divide, many pre-service teachers are unlikely to build connections between the two facets of their newly developed knowledge. As a result, many experience difficulty when they try to relate their field experience to theory taught at university. This view was supported by Sorin (2004) in her study of a Webfolio project designed to address these issues of integration, relevance and collaboration in pre-service teacher education. She stated that "student teachers often report a lack of connection between what is learned in university studies and in the classroom, and often report feelings of being unprepared for the 'real life' situations that face them in their first days of classroom teaching" (Sorin, 2004:102). These findings suggest that a lack of theory-to-practice connection is a reason many beginning teachers are often unable to retrieve important theoretical knowledge when they need it and this may explain why they find it difficult to adjust to classroom life (Kervin & Turbill, 2003).

The practical component of pre-service teacher education is often viewed as playing a significant role in pre-service teacher education (Guyton & McIntyre, 1990; Lim & Tan, 2001). In 2001, Lim and Tan conducted a survey-based study at the National Institute of

Education, Singapore. The purpose of this study was to examine pre-service teachers' perceptions of the importance of the acquisition of theoretical knowledge and practical skills. Their findings suggest that the pre-service teachers "rated the practice items as being more important than the theory items for 16 of the 18 pairs of comparisons" (2001:2). Their findings indicated that the participants seemed to "prefer instrumental understanding: That is, knowing what to do without knowing the reasons" (Lim & Tan, 2001:5). Lim and Tan (2001) explain that the limited time allocated to the educational psychology module to explain and clarify the importance of theories and their relationship to practice may be a reason for this finding. However, research on the practical component of pre-service teacher education indicates that seeing the coursework (theory) and field experience (context) aspects as being separate and disconnected from each other makes the transfer of learning problematic for pre-service and beginning teachers. In an Australian study, Watson and Johnson (2005) explored the impact of field experience on pre-service teachers' retention in a teacher education program. Through the use of survey data Watson and Johnson found that retention in a teacher education program can be attributed to the success of field experience. This finding reinforces the belief that field experiences play a significant role in teacher education and that pre-service teachers often attach a higher value to their field experience than to their university studies (also see, for example, Lanier & Little, 1986).

In contrast to the above findings, some studies have concluded that the field experience may not always be the most important component of pre-service teacher education. In a recent study commissioned by the Victorian Institute of Teaching (VIT), Ingvarson, Beavis and Kleinhenz (2007) examined the factors affecting the impact of teacher education programs on teacher preparedness. The purpose of this study was "to provide guidance to policy makers about the standards that might be appropriate for assessing and accrediting teacher education programmes in the future", thus ensuring that the new graduates are better prepared for the demands of teaching (Ingvarson, Beavis & Kleinhenz, 2007:354). They suggest that although there have been calls for pre-service teacher education to be designed in a more 'practical' manner, with school-based training at the forefront of teacher education, their findings suggest otherwise. They admit that while field experience is undoubtedly necessary for pre-service teachers, an emphasis on developing skills in reflective practice and pedagogy will not substitute for

a lack of understanding regarding the aspects of content knowledge. They suggest that the best way to proceed might be to find a suitable and manageable balance between the current traditional and suggested practical-based approach (Ingvarson, Beavis & Kleinhenz, 2007:377-8). Therefore it seems that in order to narrow the gap between teachers' perceptions of theory and practice, a more balanced curriculum highlighting the importance of the theory/practice relationship is required.

The literature frequently claims that pre-service teacher education is irrelevant to the 'real world' (Carpenter & Russell, 2002; Darling-Hammond, 1999; Roth, 1989; Zeichner, 1986) of teaching and fails to concentrate on the practical expectations of teaching. Such researchers argue that there is a gap between theory that is taught in the university and teaching practice that is linked to the classroom. The Ministerial Advisory Council on the Quality of Teaching (1998) highlighted these concerns in 1998 suggesting that initial teacher education should have stronger links between practicum and non-practicum learning and these links be made more explicit in pre-service teacher education. This was also reflected in the findings of the review completed by the Educational Training Committee (2005) which suggests that achieving the right balance between the theoretical and practical components of teacher education is one of the most important challenges currently facing those involved in the design, delivery and accreditation of teacher education. Overall, the Legislative Council, Standing Committee on Social Issues (2005) in New South Wales states:

There are a lot of reasons why teachers leave in the first year. One of them relates to the lack of connection that occurs in some universities between theory and practice. They can handle the theory and complete their assignments but when they go out into the classrooms and into the schools they find it difficult to transfer that theory into practice (Legislative Council, Standing Committee on Social Issues, 2005:44).

In summary, the studies mentioned in this section assert that most pre-service teacher education models are based upon a system in which it is the responsibility of the university to teach 'theory' and that of the field experience school of explaining and supervising classroom practice (Brady, Seagal, Bamford & Deer, 1998; Graham & Thornley, 2000). The impact of implementing these models has been that many beginning teachers enter the classroom with a feeling of being under-prepared for life as



a teacher. When they enter the profession, beginning teachers respond to this inadequate preparation by either reverting to teaching how they were taught and/or leaving the profession early. Some alternative pre-service teacher education programs that were designed to bridge the theory-to-practice divide will be examined later in this chapter.

### **The Development of Professional Identity**

Professional identity may be described as the fostering of “self descriptions” (Winslade, 202:35), which are confirmed by the social and cultural norms within their context (Winslade, Crocket, Monk & Drewery, 2000). “It represents the process by which the person seeks to integrate his various statuses and roles, as well as his diverse experiences, into a coherent image of self” (Epstein, 1978:101). Further, Sachs (1999) explained that teachers may inhabit multiple professional identities. Primary school teachers may take on the general identity of a primary teacher; however;

...this can be broken down into further identities by year level, such as a junior, middle or upper school teacher; a subject or discipline specific teacher such as special education teacher, music teacher, physical education teacher and so on. These people may see themselves as belonging to the generic category of a primary teacher but also identify with their area of specialisation and year level (Sachs, 1999:5).

Professional identity thus provides a shared set of characteristics and values that allow for differentiation from one group to another. This differentiation from one group to another is of particular concern when discussing the development of a pre-service teacher’s professional identity, as the context within which professional identity emerges, changes from one practical setting to another as each field experience placement can differ widely (Cattley, 2007). Cattley (2007:338) explains that a pre-service teacher’s “identity is particularly vulnerable from one practicum experience to the next, as each school placement can differ widely”. Thus a pre-service teacher must exercise “fine judgments about contextual factors” (Coldron & Smith, 1999:716). The construction of a pre-service teacher’s identity thus becomes a partnership between the social and the individual person within the domain of teaching, with an emphasis placed upon the importance of knowing who you are and what you believe as a teacher.

Beijaard, Meijer and Verloop (2004) suggest that professional identity development is an ongoing process that involves the interpretation and reinterpretation of experiences. There are a number of factors that influence the progression of a teacher's professional identity, which by nature has "messy meanings" (Zembylas, 2003:109) and is "rich and complex" (Sachs, 2001:160). These factors include the degree of general self-confidence and the strength of relationships with others. The quality of the pre-service teacher's relationship with their supervising teachers is especially important as the supervising teacher play the role of mentor and assessor (Cattley, 2007). Further, the nature of feedback given on a pre-service teacher's teaching skills also "play a part in the development of self-efficacy and hence, also of self and professional identity" (Cattley, 2007:339). Thus, the professional identity of pre-service teachers begins to form during their field experiences; hence the provision of supportive field experience contexts during their pre-service teacher education is of great importance.

### **The Impact of Pre-service Teacher Education on the Development of a Professional Identity**

During the past few decades there has been an increased interest in how teachers develop their professional identity and several studies suggest that the development of a professional identity is an important factor in becoming an effective teacher (e.g. Bullough, 1997; Connelly & Clandinin, 1999; Knowles, 1992; Mayer, 1999b; Van den Berg, 2002; Walkington, 2005). Wenger (1998:149) identifies five dimensions of identity, including:

- i. Identity as negotiated experiences where we define who we are by the ways we experience ourselves through participation, as well as the way we and others reify our selves;
- ii. Identity as community membership where we define who we are by the familiar and unfamiliar;
- iii. Identity as learning trajectory where we have been and where we are going;
- iv. Identity as nexus of multi membership where we define who we are by the ways we reconcile our various forms of identity into one identity; and

- v. Identity as a relation between the local and the global where we define who we are by negotiating local ways of belonging to broader constellations and manifesting broader styles and discourses.

The construct of identity becomes a partnership between the social and the individual person within the domain of teaching. Emphasis is placed upon the importance of knowing who you are and what you believe as a teacher. Wenger (1998:149) explains that identity is “a constant becoming” that defines who we are through “the ways we participate and reify our selves; our community membership; our learning trajectories (where we have been and where we are going); reconciling our membership in a number of communities into one identity; and negotiating local ways of belonging with broader, more global discourse communities”. Wenger’s theory suggests that learning in teacher education is evident when there is increased participation in meaningful activities, where the learner actively makes meaning and develops a sense of belonging within multiple communities of practice. Therefore, it can be surmised that becoming a teacher involves an evolving process of identity formation that is always under construction.

A number of studies have focused on teacher growth and the development of professional identity through stages in which each subsequent stage is more complex than the last (Black & Ammon, 1992; Fuller, 1969; Kagan, 1992; Van Manen, 1977). Van Manen’s (1977) study on reflectivity in teaching identified three sequential and invariant levels of reflection in terms of their intentions when considering a decision. These included technical or instrumental; practical or awareness of alternative principles; and critical or consideration of moral principles relating to social conditions. In another study, Black and Ammon (1992) developed a five-stage theory of pedagogical thinking. Their study involved a cross-section of the perceptions of pre-service, beginning, and experienced teachers. Their findings suggest that teachers begin their career with behaviourist conceptions and then move to constructivist conceptions that are initially universal (level 3), and then become more differentiated and integrated (levels 4 & 5). Another five-stage theory was proposed by Berliner (1994) which explains teachers’ cognitive processes as they moved from novice to expert. He described these stages as, novice, advanced beginner, competent, proficient, and expert. Similar to Black and Ammon’s (1992) five-stage theory of pedagogical thinking,

Berliner's (1994) five-stage theory is hierarchical in nature. However, Berliner's theory notes that teachers do not necessarily move through each stage on the basis of experience alone; rather, in order for progression to occur the teacher must have an increased sense of responsibility and a deepening emotional involvement. He also notes that some teachers can remain fixed on a particular stage. This is in contrast to Black and Ammon's (1992) five-stage theory in which learners progress through each subsequent stage as they advance their understanding of their profession and gain further experience.

One stage theory on the development of a professional identity uses 'concerns' to explain each stage of development. The notion of 'concerns' has been adopted in theories of group development (see, for example, Bradford, 1978) and in the domain of teaching and learning (Fuller, 1969). Van den Berg and Vandenberghe (1981, 1995) describe 'concerns' as the questions that arise with an emotional undertone, thus indicating uncertainty and possible resistance to new situations and/or change. In his review of literature regarding teachers' professional development, Van den Berg (2002:593) suggests that there are three distinct types of 'concerns' including:

- Self-concern (where each person confronted with a change will first be concerned about him/her self and will often react instinctively);
- Task concern (including worries, questions, and needs related to the processes and demands associated with the implementation of the task); and
- Impact concern (which involves attention to the colleagues/students with whom one must cooperate).

These concerns are representative of the reviews of pre-service teacher education (discussed earlier in this chapter). The reviews of pre-service teacher education suggest that pre-service and beginning teachers are often concerned with survival issues (self-concerns) at first, moving onto concerns about their performance as teachers (task concerns), and finally concerns about successful teaching experiences in regards to their students needs (impact concerns) (Fuller, 1969). What should be highlighted here is the progression of pre-service and beginning teachers from concerns for 'self' to concern for the students' learning needs. This progression of concerns has been identified in a number of other studies, consistent with Fuller's model (e.g. Ellis, 2001; Kagan, 1992; Nias, 1989; Pigge & Marson, 1997; Sleeter, 2001). Overall, the 'concern'-based theory

of professional development suggests that only after beginning teachers resolve their issues regarding their 'self' image as a teacher, can they move on to the next stage of development.

The majority of stage-based theories that attempt to explain the development of teachers' professional development imply that transition from one stage to another is a somewhat straightforward process. However, Bullough (1989) in his case study of a first-year beginning teacher suggests an alternative. He states that "human development defies easy categorization. It is seldom smooth, never conflict-free, and frequently characterized by backsliding" (1989:17). Furthermore in '*The International Handbook of Teachers and Teaching*', Bullough (1997) suggests that beginning teachers do not go through a clear transition of stages and that teachers vary considerably. In agreement with Bullough's claim, Richardson and Placier (2001) suggest that stage theorists often do not examine the factors that prompt transition of stages; rather they often take a cross-section of pre-service, beginning, and experienced teachers. Furthermore, little is usually noted about each of the contexts of the participant teachers, and thus cannot be generalised across all teachers' development of a professional identity. Similarly, Feiman-Nemser (2001a:1048) conceptualised 'learning to teach' as a continuum of learning rather than a set of stages. She suggests that a teacher's learning and development is a continuous process that requires coherent and connected learning opportunities that link pre-service teacher education with beginning teacher induction and continuing professional development. Therefore, teachers are continuously developing their identity through their interpretation of their experiences within their context and that this is not a linear or unidirectional process, arguing instead an ongoing, multi-directional and transactional process.

The issues identified in reviews of pre-service teacher education (discussed earlier in this chapter) suggest that current initial teacher education approaches are too theoretical and do not adequately prepare teachers for the complex range of classroom issues that they will face in the classroom. Although the reviews suggest that teacher education is often content-based with brief stints of practical experience, many graduate teachers finish their degree with an inadequate professional knowledge base. Furthermore, pre-service teacher field experiences are often presented as "fragmented" and

“decontextualised” learning experiences (Commonwealth Department of Education, Science and Training, 2002; Education and Training Committee (Victoria), 2005; Ministerial Advisory Council on the Quality of Teaching, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). The findings of these reviews are consistent with the notion of the continuous development of pre-service and beginning teachers’ professional identity. As pre-service teachers begin their teacher education they are confronted with information, terminology and experiences unfamiliar to them (basic/initial stage of learning). Once they become more familiar with this knowledge and experience they progress to a new stage of their learning. It is important to note that this may, or may not be hieratical in nature; rather, an individual learner follows an individual path. The literature suggests that the notion of ‘self’ is a central component of the development of a professional identity (Britzman, 1993; Kelchtermans & Ballet, 2002; Wenger, 1998). Thus, the development of a teacher’s professional development is an individual and unique process and has been explained as a complex and ongoing process in which a teacher combines “parts of their past, including their own experiences in school and in teacher preparation, with pieces of the present in their current school context” (Feiman-Nemser, 2001a:1029).

Although stage based and/or concern based theories are discussed in detail, this review serves as an overview of the literature regarding teacher professional identity. For the purpose of this review the idea that ‘learning to teach’ is a continuum of learning, which may or may not be defined by stages and/or concerns, is the main argument. The literature cited supports the notion that learning to teach is multi-faceted in nature and lengthy in duration. Beijaard, Meijer and Verloop (2004) suggest that professional identity development is an ongoing process that involves the interpretation and reinterpretation of experiences. Similarly, Flores and Day (2006:220) defined the development of a teacher’s professional development as “an ongoing and dynamic process which entails the making sense and (re)interpretation of one’s own values and experiences”. Therefore, teacher identity formation is a dynamic and active process guided by the pre-service teacher’s prior life experiences, pre-service teacher education, and context. This will be discussed further below.

## **Influence of Previous Life Experiences on the Development of Professional Identity**

A teacher's professional identity is a complex and ongoing process in which a teacher combines "parts of their past, including their own experiences in school and in teacher preparation, with pieces of the present in their current school context" (Feiman-Nemser, 2001a:1029). This belief can be traced back to Lortie's (1975) study of two urban schools in America, where he identified observation as a powerful influence over teachers' beliefs and practices, which he termed 'apprenticeship of observation'. This concept was first published in Lortie's seminal work, *Schoolteacher*. In this book, he suggested that a teacher's concept of teaching is formed throughout the years of prior educational experiences, and that this concept, along with the influence of significant others, including former teachers, exert a powerful influence on teachers' practices. Knowles and Holt-Reynolds (1991:88) explain that the concept 'apprenticeship of observation' is what makes the preparation of teachers so different from the preparation of other professionals, because in comparison, beginning candidates in professions such as law have not been immersed in their future occupation prior to entering their professional training. Overall, Lortie's (1975) work provided a catalyst for research on teachers' prior experiences in relation to their developing professional identity and has been extended by subsequent studies (see for example, Bullough, Knowles & Crow, 1989; Flores, 2001; Hatton, 1998; Lortie, 1975; Mayer, 1999b; Rust, 1994).

Studies have suggested that pre-service teachers' prior life experiences play an important role in their development of a professional identity. In Knowles's (1992) case study of pre-service and beginning teachers' role identity and image of teaching, he found that participants with strong role identities were less likely to experience difficulty when responding to challenging situations and contexts than those with weak role identities. He concluded that prior beliefs and overall life experiences play a major role in the way pre-service and beginning teachers approach and think about themselves as teachers. This is supported by professional identity stage/concern theories, in which the learner is in the initial stage of learning (novice) and is primarily concerned with issues of self. A more recent study, conducted by Flores (2001) utilised both semi-structured interviews and questionnaires to explore fourteen beginning teachers' school

cultures and the influence of those cultures on their learning and development. This study suggested that ‘significant others’, relatives, or former teachers play a crucial role in her participants’ decisions to enter the teaching profession; in addition these participants credited their experiences as students (their ‘apprenticeship of observation’ - Lortie, 1975) as another important factor in their decision to undertake the profession. Further, the findings suggest that their ‘apprenticeship of observation’ had a great influence on their teaching practices and how they viewed themselves as teachers. While Flores (2001:144) did acknowledge the participants’ context as having an influential effect on their identity formation, he concluded, however that “the way in which new teachers interpret their own experiences of teaching is influenced by their personal biography, beliefs and expectations.” What is clear is that a pre-service teacher’s prior experiences have a profound effect on the development of their own professional identity.

### **Influence of Pre-service Teacher Education on the Development of Professional Identity**

Within the last decade several new professional standards for beginning teachers were proposed and introduced in Australia. The use of professional teaching standards that focus on technical competencies has been debated. While there is general consensus among teacher educators regarding the need for a national standard, the same cannot be said about specific approaches suggested to achieve these standards, as there are implications for pre-service teachers and the programs that these pre-service teachers enrol in. Schön (1983:23), for example, suggested that technical competencies cohere with the traditional view of professional knowledge as being standardised and scientific, yet ignores the importance of identity in professional decision-making. Hargreaves (1998:850) had a similar argument believing the nature of teaching cannot be expressed within ‘technical competencies’ as teaching centres on human interaction and emotional understanding. Mayer (1999a) expanded on this, stating that there needs to be an explicit focus on teacher identity distinct from a teachers’ functional role. Mayer (1999a:6-7) states that “a teaching role encapsulates the things the teacher does in performing the functions required of him/her as a teacher, whereas a teaching identity is



a more personal thing and indicates how one identifies with being a teacher and how one feels as a teacher”. Mayer (1999a:8) continues by explaining that “it is possible to become an expert practitioner by actually doing the job, by performing the skills, but true professional teaching involved another dimension, an intellectual dimension”. Thus, according to this description, a teacher’s professional identity is based upon the core beliefs one has about teaching and being a teacher, which are continuously formed and reformed through experience. While Mayer (1999a) identified two different aspects of a teacher (teacher identity and functional role), it is important to note that they are not mutually exclusive; rather they are intertwined components of the developing professional. Walkington (2005:54) suggests that “the functional competencies of being a teacher are developed differently, being shaped by the individual’s evolving perspectives and philosophies of teaching”. She suggests that this view of learning to teach challenges how pre-service and beginning teachers are evaluated and the demonstration of specific technical competencies is no longer sufficient.

In 2003 the Australian College of Educators acknowledged that what teachers know, do, expect and value have significant influences on the nature, extent and rate of student learning’ (ACE National Statement, 2003). Although this national statement recognised the difference between what a teacher ‘knows’ and ‘does’ (the functional role), and what a teacher ‘expects’ and ‘values’ (teacher identity), it did not necessarily follow through to the state level (which is important as currently the state government determines the level of teacher competence required to teach in each state). For example, in 2005, the NSW Institute of Teachers overlooked the personal aspects of the teaching profession in its statement of standards. The key elements of the professional teaching standards include:

- Teachers know their subject/content and how to teach that content to their students;
- Teachers know their students and how students learn;
- Teachers plan, assess and report for effective learning;
- Teachers communicate effectively with their students;
- Teachers create and maintain safe and challenging learning environments through the use of classroom management skills;
- Teachers continually improve their professional knowledge and practice; and

- Teachers are actively engaged members of their profession and the wider community (NSW Institute of Teachers, 2005:3).

The majority of these key elements concentrate solely on the knowledge of students and the communication of strategies and subject matter. These standards were not designed to take into consideration the complex nature of a teacher's identity; rather they define measurable aspects of the teaching standards that commencing teachers are expected to achieve. Thus, it may be that the aspect of teacher identity is missing in the current state level professional standards statement for beginning teachers because it is complex, and too difficult to quantify as a standard. It is, however, important to note that the current national debate about pre-service teacher education puts forward statements to acknowledge the need to develop pre-service and teacher professional identity.

Walkington's (2005) study of developing teacher identity through reflective practice looked at how first year pre-service teachers perceived their journey towards teaching. When asked what they expected to learn as a result of their university studies the majority of the participants identified subject knowledge, how to teach the subject knowledge, how to gain the respect of their classroom students and how to 'control' their students (Walkington, 2005:58). This suggests that these pre-service teachers were more concerned with the functional role of a teacher's work, rather than the development of professional identity. However this may be simply a result of the focus of the study, and may not reflect the participants' perceptions of the development of their professional identity; rather it may be an indication of their growing understanding of a teacher's role.

Thomas and Beauchamp's (2007:232) study on developing a professional identity in teacher education aimed to make use of knowledge of 'self' to help them to establish a level of comfort and a sense of accomplishment in their new roles. Through data collection techniques such as reflection and interview, their participants identified both their field experiences and coursework equally as being important in learning about the profession of teaching and the role of a teacher. However, Thomas and Beauchamp suggest that the participants may have identified their coursework to please the interviewers (as the researchers of this study were also the teachers of the course, the student participants may have told them what they thought they wanted to hear,

therefore this finding may need to be interpreted with caution). Nevertheless, the findings suggest that the beginning teachers were able to reflect upon their pre-service training and see the importance of the theoretical information they were taught. Another finding of the Thomas and Beauchamp (2007) study suggests that there are limits to the pre-service teacher education program. A common theme to emerge from this study highlighted the fact that “it is impossible to learn all the necessary elements for effective teaching in a teacher education programme” (Thomas & Beauchamp, 2007:237).

### **Some Alternative Pre-service Teacher Programs Designed to Facilitate Beginning Teacher Transition into Schools and the Development of Professional Identity**

As previously discussed, the traditional pre-service teacher education model is often content-based. Schön (1983) described this as a linear path beginning with basic knowledge, followed by foundations of education, and finally methods and practicum. Vadeboncoeur and Torres (2003) suggest that this model of learning is ineffective as it assumes that knowledge about teaching can be taught in a decontextualised manner. By way of contrast, a situated perspective on learning suggests that some types of knowledge are better developed in an authentic context as it has the potential to better demonstrate the interplay between theory and practice (Brown, Collins & Duguid, 1989; Putnam & Borko, 2000). The Ministerial Advisory Council on the Quality of Teaching (1998), took a similar perspective when it suggested that the early integration of field experiences would be beneficial in pre-service teacher education, to better enable pre-service teachers to gain a better understanding of the theory/practice nexus (MACQT, 1998). In addition, Cartwright, Gervasoni and Nuttall (2001) in their study which aimed to assist pre-service teachers in their professional development and learning through the integration of theory and practice, suggested that “it would be advantageous if student teachers were to spend more time, albeit in a voluntary capacity, in the classroom” (2001:4). They continue to suggest that this additional field experience will enable the pre-service teachers to better understand how much of the teaching strategies implemented are underpinned by theory. Overall, the practical component of pre-service teacher education is viewed as playing a significant role in pre-service teacher training. Further it has been argued that the field experience component has the potential to better

prepare beginning teachers by situating them in an authentic context that is similar to their future role (MACQT, 1998). Presumably this approach will help to reduce the impact of ‘transition shock’ when they begin teaching.

A number of pre-service teacher programs have been designed and implemented across a range of tertiary institutions which address some of the issues identified by teacher education reviews including the reduction of ‘transition shock’ for beginning teachers. A selection of these will be examined in connection with beginning teacher transition into schools and the development of professional identity. In 1999, an alternative model of teacher education known as the Knowledge Building Community (KBC) Project was trialled by Cambourne, Kiggins and Ferry, with support from the NSW Training and Development Directorate of the Department of Education, four local primary schools and the NSW Teacher's Federation. The KBC model was underpinned by four key principles, designed to support student learning. These principles or ‘pillars of learning’ (Cambourne, Ferry & Kiggins, 2003) included, community collaboration, taking responsibility for own learning, professional problem solving using the principles of problem-based learning and reflective practice. The findings suggest that by being part of a KBC the pre-service teachers were able to develop an ownership and responsibility for their learning through the support of the community (including the KBC facilitators, school-based teachers and each other). The pre-service teachers, with the support of the community, were able to “link theory to practice as well as developing an increased understanding of the culture of schools and the way that they operate” (Cambourne, Kiggins & Ferry, 2003:15). In another study, Kiggins and Gibson (2002) examined the experiences of several of the pre-service teachers who graduated having completed their Bachelor of Teacher via the KBC model and had begun full-time teaching. Kiggins and Gibson’s focus was on how these beginning teachers made the transition between the campus and the classroom. This study found that the principles of the KBC project positively supported the teachers during this transition (Kiggins & Gibson, 2002). What this study highlights is that alternative models of teacher education, such as the KBC, may support pre-service teachers in linking ‘theory’ to practice and better understanding the role of a teacher, which may subsequently aid beginning teacher transition and reduce the rate of beginning-teacher attrition. The KBC program required the use of resources such as a specialist room, higher teaching loads and greater school

involvement. In a climate of economic restraint, the funding could not be maintained and the program ended in 2006.

Another alternative model of teacher education was reported on by Ferfolja (2008) called 'Classmates'. This initiative was developed with the aim of building teacher capital (Bourdieu, 1977) to better prepare new graduates for their professional careers. 'Classmates' is a field experience initiative whereby the pre-service teachers attended a host school three days a week on a continuous cycle spanning four months (the same as the amount of time on field experience as a mainstream cohort). During this time the participants "had the opportunity to undertake a range of professional duties, ranging from programming, planning and curriculum delivery through to the development of classroom management skills" (Ferfolja, 2008:76). The findings report that as a result of this 'Classmates' field experience, the participants gained a comprehensive knowledge of teaching and were able to participate in extra-curricular activities and liaise with the local community. As their acquisition of knowledge was beyond the classroom, they gained "first-hand experience in the full role of the teachers" (Ferfolja, 2008:76). This immersion in a school setting therefore enabled an understanding of the functional role of a teacher and aided in the development of the participants professional identity. A key finding was that pre-service teachers reported a strong sense of belonging and ownership of their own teacher identity because the participants were given regular time and planned experiences that allowed them to take on the role of a teacher and they reported a sense of belonging and ownership of a teacher's identity. Furthermore, the structure of the 'Classmates' initiative meant that the participants' field experience coincided with university coursework. "As a result, pre-service teachers' capital was not only in the development of a practical pedagogy, but in the recognition of the important relationship between theory and practice" (Ferfolja, 2008:77). Overall, the simultaneous learning of theory and practice enabled on-going discussion of pedagogical practices provided the participants with "the ability to be able to analyse their own practice and that of others while learning about theory" (Ferfolja, 2008:78). This theory-to-practice link served as an important pedagogical tool to aid the pre-service teachers in their understanding about the role of a teacher.

In 2007, Ingvarson, Beavis and Kleinhenz conducted a study to investigate the characteristics of effective initial teacher education programs, as reported by teachers after their first year of teaching. The research found that those who reported themselves to be well prepared to meet the demands of their first year of teaching believed their pre-service teacher education gave them “deep knowledge of the content they were expected to teach, and how students learned that content, as well as skills in: diagnosing students’ existing levels of understanding of the content; planning activities that would promote further development of understanding; and assessing the extent to which development had taken place” (Ingvarson, Beavis & Kleinhenz, 2007:351). This suggests that, as long as the afore-mentioned knowledge and skills are effectively integrated into the pre-service teacher education program, both traditional and alternative pre-service teacher education models may aid in the development of a professional identity and beginning-teacher transition, thus reducing the rate of beginning-teacher attrition.

Teacher educators have long looked for more effective and relevant ways of bridging the gap between theory and practice, developing pre-service teachers’ professional identity and easing beginning-teacher transition into the school setting. The KBC and ‘Classmates’ are just two alternative models of pre-service teacher education that have shown some success in achieving these goals. Another approach has been to use virtual learning environments such as simulations, as a tool to experiment with practical scenarios while providing explicit links to the theory of pre-service teacher training.

## **The Use of the Principles of Andragogy in Teacher Education**

As previously mentioned, andragogy is based on five principles of the adult learner. These include:

- Self-Concept: As a person matures, he or she moves from dependency to self-directness.
- Experience: Adults draw upon their experiences to aid their learning.

- Readiness: The learning readiness of adults is closely related to the development tasks of their social roles.
- Orientation: As a person learns new knowledge, he or she wants to apply it immediately in problem solving. Thus an adult is more problem-centered than centered in learning (Knowles, 1980:44-45).
- Motivation (Later added): As a person matures, he or she receives motivation to learn from internal factors (Knowles, 1984:9-12).

The five principles of adult learning are interrelated and work together to account for how and why an adult learner acquires new information. The principles of 'Experience' and 'Self Concept' are of particular importance in teacher education as this is where the pre-service teacher makes links between the theory of their pre-service teacher education and their field experiences, and begin conceptualising their professional identity.

Argote, McEvily and Reagans (2003) point to experience as an important factor in one's ability to create, retain and transfer knowledge. However, simply having experience is not enough. It has been suggested that a philosophy of reflective practice will help pre-service teachers articulate the theory-to-practice relationship and thus build stronger connections between the theory of their pre-service teacher education and the practicalities of a classroom (Brady, Seagal, Bamford & Deer, 1998; Grimmert, MacKinnon, Erickson & Rieken, 1990). Reflection and reflective practice is a means to learn from experience by integrating new knowledge and constructing a new understanding of knowledge. Therefore, experience and reflection on experience becomes an integral aspect of an adult learners understanding of the theory-to-practice connection. Furthermore, Shin (2006) suggests an integrative and reflective approach where student teachers are encouraged to construct their own philosophy of education integrating their experiences and personal practical knowledge with general theory. Therefore, through reflection of their learning experiences, the adult learners (pre-service teachers) are able to interpret and reinterpret experiences thus coming to a new and always evolving professional identity. Therefore any program, which is concerned with the preparation of pre-service teachers, needs to incorporate these principles in design and implementation of learning experiences. The principles of andragogy are

further expanded on in regards to pre-service teacher education and how they guide this inquiry in Chapter four.

## **Simulations**

Throughout history simulations have been used for the purpose of training and performance testing (Doyle, 2002) as they have the potential to greatly enhance any learning experience by supporting the learning of the individual within a domain (Jonassen, 2000). However, limited research has been conducted in the use of virtual learning environments in pre-service teacher education and how engagement with simulations can support the learning and development of pre-service teachers. Simulations can be presented in a number of ways including role-plays, games and computer programs and have the potential to encourage students to become active participants in their learning and think more deeply about decisions made (Conrick, Dunne & Skinner, 1997). Doyle (2002:1) defines simulations as an “artificial representation of a complex real-world process with sufficient fidelity to achieve a particular objective, usually for the purposes of training or performance testing”, whereas Aldrich (2004) defines simulations as interactive, representational environments that can provide effective learning experiences that require learners to construct their knowledge actively. Kaufman and Sauve (2004:1) reinforce such comments by explaining that simulations are “activities that include exploration and practice within models of reality but without competition, scoring, and winners/losers”.

Doyle (2002) identifies that simulations have been used throughout human history as a part of training for such activities as animal hunting and preparation for warfare. Doyle (2002:1) explains that an early type of simulation dating back to Roman times or earlier, consisted of an object mounted on a post, which “crudely but effectively simulated the behaviour of an opponent during sword fighting”. In more recent times, preparation for war has resulted in simulations becoming more technologically advanced and widely used in a number of fields such as education, training and performance assessment in military, aeronautical, business, health education and public health. Overall, Kelly



(2002) believes that this recent increase in simulation popularity is the result of modern-day technology creating a realistic learning environment, which may be motivating for learners.

## **Review of Simulations**

Simulations are usually created for use in training and performance-testing situations. Gatto (1993) in her discussion on the use of interactive computer simulations in training suggests that the reasons for this is often due to a lack of relevant resources, the cost of alternative training is too expensive and there is a potential risk to human life. Furthermore, she states that simulations are an important tool in training and performance testing as they “provide the learner with practice of the behaviour he/she will be called upon to exhibit in reality” (Gatto, 1993:144). Recently, the availability of relatively inexpensive computer technology has enabled simulations to be used in a variety of fields such as medicine, aviation, the military and business. Overall simulations are unique training tools because “when used in an instructional context are repeatable, consistent, take less time, cost less than most other instructional strategies and are always available” (Gatto, 1993:145). See appendices A to D for examples of research on simulations within the disciplines of medicine, aviation, military and business.

As a result of this review of simulations across a range of disciplines, some design principles on the creation of a simulation (in areas such as medicine, aviation, military and business) have become apparent. These include:

- Authentic situations, choices and outcomes  
Authentic activities that are relatively undefined and open to multiple interpretations, requires students to identify the tasks and subtasks needed to complete major tasks.
- Focus on key skills and knowledge (without excess complexity)  
Each scenario or challenge needs to have key focuses. Specific learning tasks and activities within a simulation help focus the learner on the development of particular skills and knowledge needed in a real-life situation.

Varying degrees of difficulty

- Feedback

Simulations that offer feedback (through facilitation or recording and playback capabilities) can help students gain important insights impossible through other learning methods. Objective feedback helps make the connection between actions and results more clear and explicit for the learner. The learner can go back into the simulation to try again, armed with the insight provided by the feedback. By a process of experimentation, application of theoretical concepts to the simulated task environment, and feedback, the learner can make quick progress in skill development.

The simulations described all aim to increase the learner's understanding of, and ability to, react efficiently to common scenarios. Because of the nature of these fields (medical, aviation, military and business), the scenarios presented within the simulations are process-defined and often only have one or two acceptable responses. Within the field of education however, the scenarios encountered in a classroom are more likely to be open to a variety of solutions. Therefore, simulation design needs to have a strong link between theory and practice (scenario) rather than procedure and practice (scenario).

### **How Simulations can Support Teaching and Learning**

There are a number of advantages when incorporating simulations in to teaching and learning situations. A major advantage of simulations is that it is a virtual environment, thus a safe environment in which a learner can feel free to explore new possibilities without the fear of harm or failure. Schank and Neaman (2001) explain that any skill is enhanced through practice and feedback, 'learning by doing'. Furthermore they suggest that a safe environment, in which the learner is free from the worry of failure, is essential to any effective learning environment. It is also believed that the virtual environment of the simulation can allow instruction to be tailored to the individual needs of the user, because the learner is the focal point of the experience, which is especially important during early training (Kneebone & ApSimon, 2001, p.911).

In addition to a safe environment, simulations have the potential to provide an authentic learning experience. Jonassen (1991) defines authentic learning experiences as tasks that have real world relevance and utility, that integrate across the curriculum, that provide appropriate levels of complexity, and that allow students to select appropriate levels of difficulty or involvement. However, it must be noted that the simulation is not the only consideration when creating an authentic learning situation. Barab, Squire and Dueber (2000:38) insist that authenticity occurs:

...not in the learner, the task, or the environment, but in the dynamic interactions among these various components... authenticity is manifest in the flow itself, and is not an objective feature of any one component in isolation.

Thus it is suggested that in order for a simulation to be effective in any teaching and learning experience, the simulation must be designed to authentically represent real world activities, provide opportunities for students to examine the task from different perspectives, using a variety of resources and reinforce the idea that there is no one correct answer, rather there are multiple options with varying outcomes (Herrington, Oliver & Reeves, 2003).

Another way in which simulations can support teaching and learning experiences is through reflective activities. As the learner engages with real world scenarios they are able to pause and reflect upon the experience. Reflecting on practice is consistently reported as a way to help learners to adapt current practice through a review of past performance (Dobson, Pengelly, Onynio & Sime, 2001; Herrington & Oliver, 1997; Kelly, 2002). Reflective practice provides an avenue for the learner to assess “outcomes after the event, often when activities have failed to lead to the desired outcome” (Dobson, Pengelly, Onynio & Sime, 2001:443). Dobson et al. (2001) claim that simulations can provide an ideal environment for learning, through situated practice, especially when support for reflection is also available.

In addition, simulated virtual environments have the potential to provide a supportive environment in which users can explore possible scenarios using the theory of their training in practical situations and construct their own understandings through the virtual experience. Researchers such as Reigeluth and Schwartz (1989) and Breuer and

Kummer (1990) argue that the virtual environment of a simulation enables learners to master cognitive processing skills by allowing them to apply the theory of their training within a realistic environment. Therefore the skills that are acquired during the use of a simulation can transfer to real life situations. Thus, the use of simulations in teaching and learning enables the user to experiment with decision making in role play situations (putting their theory into practice), as opposed to simply recalling the theory of their training, thereby making the learning process a more enlightening experience.

### **The Potential of Simulations to Support Pre-service Teacher Education**

Learning theorists such as Vygotsky believe that learners need context within which to explore, discover, communicate, practise, and create their own understandings of complex phenomena (Vygotsky, 1978). Simulated virtual environments as well as other virtual learning environments have the potential to provide a supportive environment through which a learner can explore possible scenarios using the theory of their training in practical situations and construct their own understanding of theory through virtual experience. Researchers such as Reigeluth and Schwartz (1989) and Breuer and Kummer (1990) argue that a virtual environment such as a simulation enables learners to master cognitive processing skills by allowing them to apply the theory of their training within a realistic environment. Therefore the skills that are acquired during the use of a simulation can transfer to real-life situations. Further, Gatto (1993:154) contends that:

...students who use simulations, manipulate variables and so on would be better prepared to perform in real situations than those students who rely on other instructional media, such as text, which can only provide information and hints on how to do something.

The use of simulation has the potential to enhance the connections made between theories and to show what this might look like in practical situations. Furthermore it can be argued that learners who use simulations in their training may be better equipped to

transfer the knowledge and skills they acquired during their education to a real-life scenario.

In 2002, a project began which aimed at improving pre-service teacher understanding of early literacy education and young children's literacy achievement in the United States of America using online video cases. The project was titled Case Technologies to Enhance Literacy Learning (CTELL) and was developed in partnerships with teachers, schools, teacher educators, and twenty different colleges of education around the United States of America over a period of two years. The project outlined three main objectives including:

- i. Raise pre-service teachers' understanding of best practices of early literacy education;
- ii. Increase pre-service teachers' use of best practices in the classroom when they first begin teaching; and
- iii. Significantly raise young children's reading achievement.

The CTELL cases utilised anchored instruction via high speed, streaming video over the Internet to provide pre-service teachers with examples of exceptional literacy instruction. Data were collected via online surveys, focus groups, and concept maps. The findings of this research suggested that through the integration of the CTELL cases into pre-service teacher education, there was an increase in the pre-service teachers' knowledge of effective principles of reading instruction. Thus, the CTELL cases were deemed to "positively affect conceptual change and knowledge acquisition as compared to control groups, implying their potential to improve the effectiveness of the nation's preservice literacy teacher education programs" (Kinzer, Labbo, Leu & Teale, 2002:2). Therefore, the CTELL project enhanced the connections made between the theory of pre-service teacher education in relation to early literacy teaching and what this might look like in practical situations. Furthermore, the findings of this study suggest that scenario-based learning in pre-service teacher education has great potential in aiding the transfer of knowledge and skills to real-life scenarios. In this study the video cases provided the learning material that was used online to stimulate greater understanding of literacy education.

In 2004, SimSchool was created as a result of funding from the United States Department of Education Technology Innovations Challenge Grant Program and the United States Department of Education PT3 Digital Equity Task Force. The SimSchool program was designed to provide a realistic and safe practice environment for users to develop skills in differentiating instruction, classroom management, special education and adapting teaching to multiple cognitive abilities. As with the design principles for simulations in areas other than education (outlined above), authentic situations, a focus of key skills and knowledge, and feedback were crucial in the development of SimSchool. SimSchool is “an environment for aspiring teachers to practise making decisions about planning, task design, and responding to students with complex personalities and cognitive profiles” (Zibit & Gibson, 2005:3). The pre-service teacher assumes the role of teacher, instructing students with diverse personalities and learning needs that react to the decisions made by the user.

In 2005, ClassSim was developed with the support of an Australian Research Council grant to support the existing teacher education programs by providing the pre-service teachers with access to additional classroom experience within a virtual environment (Ferry, Kervin, Cambourne, Turbill, Hedberg & Jonassen, 2005). ClassSim has many design principles similar to simulations used in fields other than teacher education. ClassSim presents the user with an authentic context, the need of the user to focus on certain key skills/knowledge, and feedback for decisions made. Engagement with ClassSim was incorporated into a first year core subject and data were collected via interviews, observations and reflective journals. The purpose of this study was to investigate how engagement with ClassSim can contribute to the connections pre-service teachers make between the theory of their pre-service teacher education and the ways teachers operate in an actual classroom environment with particular emphasis on the processes that the participants engaged with as they made decisions within the simulation. The findings of this study suggested that a number of pre-service teachers were able to make connections between what they had experienced during their use of ClassSim, their field experiences and their current pre-service teacher coursework (Carrington, Ferry & Kervin, 2006:48). This suggests that through the use of simulations such as ClassSim some pre-service teachers are able to build important links between the theory of teaching and the practicalities of classroom teaching. Thus the

findings suggest that there is potential in the incorporation of simulations into pre-service teacher education as they can enable learners to apply the theory of their education within a realistic environment, thereby facilitating a transfer of skills and knowledge to real-life situations.

ClassSim as a training tool informed the development of another simulation, designed to educate university students in Australia about harassment and discrimination, within the context of a university environment. Responsibility, Rights and Respect Online (RRR online), is a program that “draws from a range of student experiences in a variety of settings to raise awareness of students’ responsibilities and rights and the types of behaviour, which can be discriminatory or considered as harassment” (Wright, Wright, Kerr & Mutimer, 2008:1). This simulation utilised design principles similar to those in, ClassSim including a scenario-based scaffold, support material pertinent to each issue, expert discussions regarding each issue and an area for reflection, all geared to aid in the learner’s understanding of each issue. Furthermore, the design principles also reflect those of simulations in areas other than education. For example, RRR was designed to include authentic situations, a focus of key skills and knowledge, and feedback. Overall, RRR online has the potential to enable users to transfer the skills and knowledge they obtain from the simulation to real-life situations, thus better preparing them for life within a diverse university community.

### **The Potential of Simulations to Support Professional Identity**

Most pre-service teacher education models are based upon a system in which it is the responsibility of the university to teach ‘theory’ and the field experience school holds the responsibility of explaining and supervising classroom practice. Beginning teachers usually respond to this often-inadequate preparation by either reverting to teaching how they were taught and/or leaving the profession early. It has been suggested that a contributing factor may be an inadequate development of a teacher’s professional identity as the instrumental nature of models of teacher education leave little opportunity for pre-service teachers to examine and reflect on the core beliefs one has

about teaching and being a teacher (Bullough, 1997; Connelly & Clandinin, 1999; Knowles, 1992; Mayer, 1999a; Van den Berg, 2002; Walkington, 2005).

A teacher's professional identity is complex, and its development is an ongoing process which combines "parts of their [the teacher's] past, including their own experiences in school and in teacher preparation, with pieces of the present in their current school context" (Feiman-Nemser, 2001a:1029). Moreover, the literature identified the development of a professional identity as a possible key factor in becoming and being an effective teacher (Bullough, 1997; Connelly & Clandinin, 1999; Knowles, 1992; Mayer, 1999a; Van den Berg, 2002; Walkington, 2005), and thus should be a priority in pre-service teacher education.

The findings of this literature review suggest that information and communication technologies, such as simulations and video cases have the potential to enhance the teaching and learning processes and improve access and equity in a learning situation. However, from the literature examined and discussed it appears there has been limited research conducted on the use of simulations in pre-service teacher education. Research on ClassSim has revealed that it has the potential to provide an authentic, flexible and safe virtual environment in which effective learning can occur. The findings have also suggested that ClassSim provides a supportive environment in which a pre-service teacher can explore possible scenarios using the theory of their pre-service teacher education in virtual practical situations (Carrington, Ferry & Kervin, 2006).

As pre-service teacher education is a form of adult education, it is timely to contribute to the literature in this field by examining the learning potential of virtual learning environments from the theoretical framework of andragogy. Furthermore, as no inquiry has looked at the use of simulation technologies to enhance the development of pre-service teachers' professional identity this is another area of literature that this study can contribute to.



## Summary

Reviews of teacher education report that many beginning teachers lack practical teaching skills required to be an effective teacher. These reports contend that improvements need to be made to the pre-service field experiences and university coursework to better facilitate the development of connections between practical teaching skills and theoretical subject content, thus facilitating pre-service teachers emerging professional identity (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). Teacher professional identity is a complex concept that appears to develop as a result of dynamic processes, as previously discussed. As such it is recognised as an integral feature of a teacher's development. Further, some of the high attrition rate among beginning teachers has been attributed to the lack of opportunity for beginning teachers to develop their own professional identity. As a result, teacher educators have looked to more effective and relevant ways of addressing the limitations of pre-service teacher training. One approach has been to use virtual learning environments, such as simulations, as a tool to experiment with practical scenarios while providing explicit links to the theory of pre-service teacher training, thus supporting the development of pre-service teacher professional identity. Therefore the purpose of this inquiry remains to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation, ClassSim, to link knowledge from university coursework with field experiences, and in particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identity. As pre-service teacher education is essentially an adult education, andragogy (adult learning theory - discussed later in this thesis) will be the lens by which pre-service teacher learning and professional identity development will be analysed and discussed.

# Chapter Three

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## Methodology and Research Design

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### Introduction

This chapter describes the methodology used in this inquiry. It begins with a discussion of the theoretical background of the methods selected for this study. Specific aspects of the research method that are discussed include the use of the method in the literature, data collection procedures such as semi-structured interviewing, observations and artefact collection, and the data-analytical framework for the inquiry. These topics are discussed in detail to be consistent with the assumptions of qualitative research.

### Methodology Background

Each study has its own particular requirements; different approaches are suitable in different contexts. Patton (1900) suggests that there is no ‘one right’ direction to take as each approach has its perceived strengths and limitations and advocates for ‘methodological appropriateness’. The methods of data collection and data analysis for this research were selected according to the context of this inquiry and the required information.

This inquiry is qualitative in design working within the interpretativist paradigm. Within the interpretativist paradigm, this research can be explained as a comparative case analysis.

Figure 3.1 demonstrates the choice of and relationship among research methodologies chosen for this inquiry.

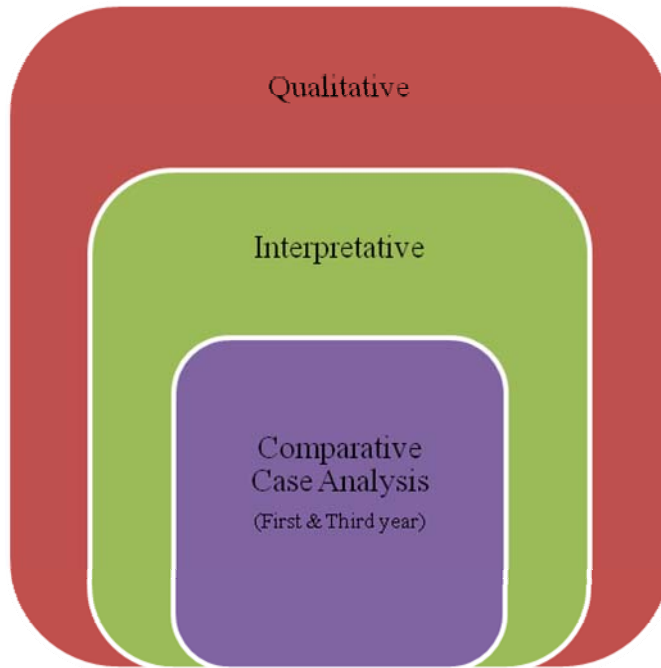


Figure 3.1: Design of Study

### **Theoretical Assumptions**

In this section, a perspective on the theoretical assumptions of this inquiry is discussed. In particular the qualitative nature of the inquiry is examined and insight is given into the researcher's theoretical assumptions (interpretativism) that guides and directs the researcher's thinking and actions. The methodological principles and consequent research practices used throughout this inquiry are justified. Finally the use of a comparative case analysis is examined as the basic design of this inquiry.

### **Qualitative Design**

Qualitative research emphasises the credibility of multiple meaning structures and holistic analysis (Burns, 2000:11). Furthermore Burns (2000:388) suggests that "the qualitative researcher is not concerned with objective truth, but rather with the truth as the informant perceives it". This is known as the social reality of the participants. Burns (2000) explains that social reality is the result of 'meaningful social interactions' as perceived from the perspectives of those involved (participants), rather than from the

perspective of the observer (researcher). Therefore this inquiry made use of participant interviews, reflective journals and observations to gain insight into the social reality and perceptions of the participants. As qualitative researchers are interested in understanding the experiences of people in context, it appears reasonable to suggest that qualitative research takes place in a natural setting, because “it is here they believe they are most likely to discover (some say uncover) what is known about the phenomena of interest” (Wallen & Fraenkel, 2001:434). Therefore, the predominant data-gathering methods of this inquiry include participant observation and interviews as qualitative methods endeavour to capture and understand individuals within their natural setting. In addition, Wallen and Fraenkel (2001:432) believe that in qualitative research there is a greater emphasis on “holistic description – that is, on describing in detail all of what goes on in a particular activity or situation”. Therefore the researcher, as a qualitative methodologist, captured what the participants said and did, via observation (supported by audio recordings), interviews and the collection of reflective journals, and as a result gained further insight into how the participant interprets reality, and understands events from their viewpoint.

### **Interpretative Paradigm**

Mertens (1998:6) explains that “a paradigm is a way of looking at the world [and] is composed of certain philosophical assumptions that guide and direct thinking and action”. According to Denzin and Lincoln (2000), the paradigm or interpretative framework is a basic set of beliefs that guides action. Such beliefs touch our daily lives in a modern world so that all research is interpretative, guided by the set of beliefs and feelings about the world. Each interpretative paradigm makes demands on the researcher, in the questions asked and the interpretation the research brings to them. This includes theories about discovering knowledge, developing understanding, and forming judgements about the credibility and authenticity of findings, which direct the particular mode or method of enquiry in a study. Lather (1992:89) identified four paradigms or methodologies of research: the positivist or empirical-analytical, the interpretativist, the critical, and the post-structural. Each of these provides a philosophical framework for addressing particular types of research

objectives/questions. Lather describes the objective of the four paradigms as: to predict (positivist), to understand (interpretative), to emancipate (critical), and to deconstruct (post-structural) (see Table 3.1).

Predict	Understand	Emancipate	Deconstruct
Positivist	Interpretative Naturalistic Constructivist Phenomenological Hermeneutic Symbolic interaction Microethnography	Critical Neo-Marxist Feminist Race-specific Praxis-oriented Freirean Participatory	Post-structural Post-modern Post-paradigmatic dia-spora

Table 3.1: Paradigms of Post Positivist Inquiry Identified in Lather (1992)

Each of these methodologies has an appropriate role to play in educational research, depending on the question, issue or problem being investigated. This inquiry draws upon the interpretative research paradigm, with the purpose to better understand how pre-service teachers make use of a virtual learning environment (ClassSim) to make connections between knowledge from university coursework with field experiences. The rationale behind this choice of paradigm is explained below.

Interpretativist research uses qualitative and naturalistic approaches to inductively understand people's experiences in their natural settings and to derive theories and propositions. Gall, Borg, and Gall (1996:29) define interpretativist research as "the study of the immediate and local meanings of social actions for the actors involved in them". Radnor (2002:29) explains that the central tenet of the interpretative research is "trying to come to an understanding of the world of the research participants and what that world means to them". In this inquiry, the researcher gained this understanding through the use of semi-structured interviews after the participants engaged with the virtual learning environment (ClassSim) and again after their compulsory field

experience. During these interviews the researcher asked a number of questions regarding the participants rationale for decisions made within ClassSim, what their perceptions were on what ClassSim could offer them in their pre-service teacher education. Robinson (1993) describes the work of interpretativist researchers as explaining action by interpreting it, by retrieving meaning embedded within the behaviour of individuals in question. Thus, the purpose of interpretative research is to clarify how interpretations and understandings are formulated, implemented and given meaning in lived situations (Radnor, 2002:4). The following sections will explain exactly how this study fits into the interpretativist paradigm in regard to ontological considerations (the nature of being in the world), epistemology (the nature of knowledge) and offers insight into the researcher's theoretical approach within interpretativism.

The ontology of the interpretative research paradigm suggests that “reality is socially constructed” (Mertens, 1998:11). Further, Weber (2004) explains that the interpretativist ontology assumes that the reality of the object is inseparable from the subject or the observer. Furthermore, Gadamer (1979) proposes that understanding has to come from open dialogue, which can be either between two people or between a reader and the text. In both cases the language is the medium of understanding. In addition Radnor (2002:14) suggests that:

...in order to understand we have to learn the language of our society. To take part in conversation or discourse helps us to make sense of our society. To be able to communicate with others means we share a form of life. We recognise what it is to be human. Language is the universal medium in which understanding occurs. Understanding occurs in interpreting.

During this inquiry the participants were given opportunities to interact with their peers whilst engaging with the virtual learning environment (ClassSim). These interactions were recorded on audio-tapes to assist the researcher to “understand the multiple social constructions of meaning and knowledge” (Mertens, 1998:11). Further, the participants' entries into the embedded cognitive tool within the simulation (‘Thinking Space’) were collected to help the researcher understand the participant perceptions of how their use

of the virtual learning environment contributes to their knowledge construction. Thus, both written and spoken language was the medium used for understanding.

One of the most basic tenets of the interpretative paradigm is that “reality is socially constructed” (Mertens, 1998:11), therefore each individual has a unique view on what reality is perceived to be. According to this view, it is the interpretative researcher’s task to make sense of the participants’ world, “to understand it, to see what meaning is imbued in that situation by the people who are part of it” (Radnor, 2002:21). Hughes (1976:25) explains, “human beings are not things to be studied in the way one studies rats, plants or rocks, but as valuing meaning-attributing beings to be understood as subjects and known subjects.” Mertens (1998:13) thus proposes that the relationships between the researcher and participants are “interlocked in an interactive process”, in order to ensure that the researcher is able to interpret the meanings the participants have attached to their experiences. Giddens (1993:169) explains this interlocked interactive relationship in more detail.

The sociological observer cannot make social life available as a ‘phenomenon’ for observation independently of drawing upon her or his knowledge of it as a resource whereby it is constituted as a ‘topic of investigation’. In this respect, the observer’s position is no different from that of any other member of society; mutual knowledge is not a series of corrigible items, but represents the interpretative schemes which both sociologists and lay actors use, and must use to ‘make sense’ of social activity - that is, to generate ‘recognizable characterisations of it’.

During the course of this inquiry the researcher and the participants formed an interactive relationship through which understanding was reached and meanings were constructed and interpreted. This interaction occurred during a number of data collection phases, including semi-structured interviews and observations.

Franz and Robey (1987) argue that data collected using an interpretativist approach provides opportunities to uncover more meaningful understanding than a method that uses a questionnaire to collect data that is limited in scope and stripped of its context. Robinson (1993:208) asserts that the researcher should get ‘inside’ the experiences of others in order to gain access to the individual’s relevant mental state. Furthermore,



interpretativist approaches give researchers the opportunity to immerse themselves in the data and to understand by inferring from the meanings that people have assigned to the data. Thus this inquiry fits within an interpretativist research approach as it aimed at examining individuals within an identified social setting. More specifically, this inquiry aimed at gaining a better understanding of a cohort of pre-service teachers in both their first and last year of undergraduate university study as they engaged with a virtual learning environment (ClassSim). Throughout the inquiry a variety of data collection methods were used that reflect that of an interpretativist research paradigm, including observations, interviews and the collection of artefacts. Mertens (1998:14) suggests that according to the interpretativist research paradigm there are multiple realities and as such “research questions cannot be definitively established before the study begins; rather, they will evolve and change as the study progresses”. Therefore, the research questions were not fixed at the outset of this inquiry; rather they evolved throughout the course of this investigation with the emerging themes within the data.

Radnor (2002:30-35) explains the way research is approached when conducted according the interpretative paradigm. The key principles include;

1. Researcher as data collecting instrument: the reflective subject;
2. Interpretative research as transactional: keep focus and interface data and developing ideas;
3. Interpretative research is ethics-in-action: dignity and respect for participants.

### **Comparative Case Analysis**

Case study research has been defined in many, often ambiguous, ways. For example, one definition sees case study as “an umbrella term for a family of research methods having in common the decision to focus an inquiry around an instance” (Adelman, Jenkins & Kemmis, 1983:2-4). Yin (1984:23) defines case study research as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. Stake (1995:xi) defines case study as “the study of the particular and complexity of a single case, coming to understand its

activity within important circumstances”. Despite this lack of clarity in such definitions, case studies have been used widely in educational research and, as Lincoln and Guba (1985:360) state, “the literature is replete with references to case studies ... there seems to be little agreement about what a case study is”. However, there seems to be agreement that case study methods in education allow an in-depth investigation of a specific person, place or thing within a specific time frame and context. Furthermore it is believed that case studies are valuable in creating deep understanding of particular people, problems or situations in comprehensive ways as “case studies help us to understand processes of events, projects, and programs and to discover context characteristics that will shed light on an issue or object” (Sanders, 1981:44). Case study methods allow researchers to understand the *how* and *why* of contemporary events, problems and situations in ways that do not require control over those events or problems (Yin, 2008). Thus, a case study approach was undertaken in this investigation as it provides for an in-depth and rich source of data concerning how the participants use the virtual learning environment (ClassSim).

A case study approach is useful when studying an individual in an in-depth, holistic fashion, thus allowing for deeper understanding (Merriam, 1998). As Merriam (1998:19) explains, “a case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. The researcher’s interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation”. Furthermore, Patton (1990:94) describes that when a researcher is utilising the case study method, the “focus is on how something happens rather than on the outcomes or results obtained”.

The researcher decided upon a case study approach because it involves “detailed, in-depth data collection involving multiple sources of information rich in context” (Creswell, 1998:61). Context is a key factor. In this inquiry it is important that the context is examined as it can have a bearing on the participants’ interaction with the simulation. Yin (2003:13) explains that “you would use the case study method because you deliberately wanted to cover contextual conditions believing that they might be highly pertinent to your phenomenon of study”. Thus, using a case study approach

allows for the possibility of gaining significant knowledge about the participants' use of the simulation and the relating contextual conditions.

This inquiry utilises the case study method to explore how pre-service teachers interacted with the classroom simulation and more importantly, how they made connections between the theory of their pre-service teacher education and their field experiences, and how their use of the software contributed to the development of pre-service teachers' emerging professional identity. In case study research the researcher typically observes the characteristics of a participant. Cohen and Manion (1980:120) state that the purpose of such observation is "to probe deeply and to analyse intensively the multifarious phenomena that constitute the life cycle of the unit with a view to establishing generalisations about the wider population to which that unit belongs". Thus a case study method enabled the researcher to obtain in-depth information from the selected participants. Data were collected through demographic surveys, observations, artefacts, and semi-structured interviews after their engagement with the virtual learning environment and both before and after their field experiences. The case study approach is an appropriate method as it enabled the researcher to report the "extremely rich, detailed, and in-depth information" (Berg, 2001:225) gathered throughout the inquiry.

When conducting case study research, there are a number of issues that need consideration including the trustworthiness, credibility and validity of the data collected. However the issue of greatest concern according to Burns (1997) is the role of human subjectivity when selecting and explaining the evidence. Furthermore, Mertens (1998:175) explains that the researcher decides what questions to ask, what to observe and what to write down. Therefore, considerable interest should be focused on "who the researcher is and what values, assumptions, beliefs, or biases he or she brings to the study". To account for these issues, the researcher explained and rationalised her theoretical assumptions in regards to this particular inquiry in considerable detail. Yin (1994) proposed three remedies to counteract potential investigator subjectivity: using multiple sources of evidence, establishing a chain of evidence, and having a draft case study report reviewed by the participants. These remedies were undertaken by the research (see Quality of Data section of this chapter).

This inquiry adopted a comparative case analysis in order to explore the relationships between two cohorts of pre-service teachers. Stake (1995:4) explains that “it may be useful to try to select cases which are typical or representative of other cases”. He continues by explaining that a collective case study is designed with a concern for representation (Stake, 1995:16). Thus two collective cases were selected to represent both first year students and final year students, enrolled in the Bachelor of Teaching (more detail in Phase Two: Participants). These participants were selected for “both their uniqueness and commonality” (Stake, 1995:1), in order to compare how each cohort of pre-service teachers made use of the virtual learning environment (ClassSim) to link the knowledge from university coursework with knowledge from field experiences. A focus was on how ClassSim may have contributed to the professional identity of these students as they made connections between theory and practice, and the interpretations made by each year group.

A comparative case study design enabled an in-depth investigation into pre-service teachers’ use of the classroom simulation. Overall, the ability to focus upon and compare two groups of pre-service teachers (first and final year students), whilst taking into consideration the contextual conditions (such as the participants’ field experiences) were the main reasons for the selection of comparative case study as the research design for this study.

## **Conceptual Framework - A Constructivist Approach to Learning**

The most prevalent theoretical perspectives in research based upon online learning are those related to constructivism. This is because technology use in an educational setting is supported by the constructivist view of learning in which the teacher is the facilitator of learning, as opposed to being the only source of knowledge (Trilling & Hood, 1999). The overarching belief of the constructivist approach is that learners interact with the world, and in the process construct their own experience and knowledge (Lyddon & McLaughlin, 1992; Novak, 1988). The focus of teaching is thus one of guiding the learner as they build on and adjust their existing knowledge. In other words there is a

focus on knowledge construction rather than knowledge transmission (McInerney & McInerney, 1994; Slavin, 1994). The three broad principles of the constructivist view of learning are as follows:

- Each person forms their own representation of knowledge, building on their individual experiences, and consequently there is no single ‘correct’ representation of knowledge (VonGlaserfeld, 1984). This principle is usually attributed to Dewey (1933).
- People learn through active exploration, and that learning occurs when the learner’s exploration uncovers an inconsistency between their current knowledge representation and their experience (McInerney & McInerney, 1994; Slavin, 1994). This principle is usually attributed to Piaget (processes of ‘assimilation’ and ‘accommodation’ (Piaget, 1962)).
- Learning occurs within a social context, and that interaction between learners, their peers, and teachers is a necessary part of the learning process (Vygotsky, 1978).

Although there is an agreement on the basic principles of constructivism, it is unclear what the consequences are for teaching and learning. This is because constructivism is concerned with the process of *how* an individual *constructs* knowledge. How an individual constructs knowledge depends upon what the individual already knows (prior experiences which differ from learner to learner). So, the meaning that each individual makes is unique, depending on the learner’s comprehension and interpretation.

Constructivism was used as the overarching framework for this inquiry. A constructivist approach was appropriate to this inquiry as the focus was on per-service teachers’ use of a virtual learning environment (ClassSim) to enhance their understanding of the role of a teacher.

### **Social Constructivism in a Virtual Learning Environment**

Social constructivism emphasises the social nature of knowledge, and the belief that knowledge is the result of social interaction and language usage, and thus is a shared, rather than an individual, experience. Vygotsky (1978) and Gergen (1995) further

emphasise that this social interaction and language usage always occurs within a specific socio-cultural context, resulting in knowledge that is culturally bound to a specific time and place. Gergen (1995:21) suggests that “knowledge does not arise within cognising individuals (endogenous) or with the ‘real world’ (exogenous), but rather that it is created in societies or discourse communities”. The epistemology of social constructivism is that cognitive development is influenced by one’s social interactions. Gergen (1995) suggests that learning is a social process with ‘dialogue’ being the most important aspect of knowledge construction. Whilst engaging with the virtual learning environment of the ClassSim, the users are encouraged to interact with their surrounding peers to facilitate knowledge construction. Bakhtin (1984:110) states that “truth is not to be found inside the head of an individual person; [rather] it is born *between people* collectively searching for truth, in the process of their dialogic interaction”. Cobb and Yackel (1996:37) explain that ‘truth’ is socially constructed resulting from “coparticipation in cultural practices” via a process of dialogic interaction. Through this dialogic interaction and engagement with the virtual learning environment (ClassSim), the pre-service teachers had the opportunity to construct knowledge based upon their prior social experience, knowledge gained from the simulation and through social interactions with their peers.

### **Virtual Learning Environments as Cognitive Tools**

Constructivist approaches to learning strive to create environments in which learners can actively participate in their environment with the purpose of knowledge construction. In this inquiry, the term ‘active’ implies that the pre-service teachers were given the opportunity to actively participate and interact with the virtual learning environment with the purpose of creating their own knowledge and beliefs. Jonassen (1992a:4) describes computer-based cognitive tools as those that can be of assistance when building an individual’s meta-cognitive strategies (strategies employed by the learner to improve their comprehension, retention and individual construction of knowledge) as such tools “amplify thinking and facilitate knowledge construction”. Further, Reeves (1998) suggests that technology, such as a virtual learning environment, has the potential to take on the role of a cognitive tool for problem solving, conceptual

development, and critical thinking thus enabling higher order thinking. As the pre-service teachers engage with the ClassSim virtual environment they have access to a number of embedded cognitive tools that have the potential to engage the user's higher order thinking. The 'Thinking Space', provided in ClassSim, is an example of a cognitive tool that provides a framework in which the user can reflect upon issues within the virtual classroom. This allows users to articulate their rationale at decision points and identify underlying influences that affect their use of the virtual learning environment (ClassSim) and their understandings of the role of a teacher. This may encourage the user to engage in higher order thinking. Other cognitive tools provided in ClassSim include 'Student Updates', 'Student Work Samples', and 'Summaries'. Opportunities are provided for knowledge construction as users engage with ClassSim and with the cognitive tools provided.

### **Reflection and Reflective Practice in Virtual Learning Environments**

Reflection and reflective practice is a means to learn from experience by integrating new knowledge and constructing a new understanding of knowledge. The notion of learning through reflection is implicit in the constructivist approach to learning. The concept of reflective practice has been attributed to Dewey who in 1933 stated that, "reflective thinking is closely related to critical thinking; it is the turning over of a subject in the mind and giving it serious and consecutive consideration" (Dewey, 1933:3). Schön (1987) further developed this notion stating that professional knowledge can only be developed through practice within an appropriate context. Schön (1987) describes that there are three different types of reflection including:

1. *Reflection-in-action*, in which one reflects on an activity as the activity unfolds, thereby guiding the future direction of the activity. This is also referred to as, "thinking on your feet" (Schön, 1987:26).
2. *Reflection-on-action*, in which one reflects on the actions that have been taken, perhaps suggesting a more appropriate action to be taken next time a similar circumstance arises.

3. *Reflection on the reflection-in-action*, in which one reflects on what they were thinking at the time the activity was carried out. Schön (1987) believes that this type of reflection leads to effective learning.

The ‘Thinking Space’ (an embedded cognitive tool of ClassSim) was consistently available throughout the running time of the virtual learning environment (and was re-accessible at any time after the user has engaged with the environment) and as such gave the user the opportunity to *reflect-in-action*, *reflect-on-action* and *reflect on the reflection-in-action*, as described by Schön (1987). The user was able to *Reflect-in-action*, by reflecting upon activities/decisions as they engaged with ClassSim, thus guiding future directions; *Reflect-on-action*, by reflecting upon activities/decisions that have occurred and suggesting alternative scenarios; and *Reflect on the reflection-in-action*, by re-examining their reflections after engaging with ClassSim.

## Research Design

This inquiry investigated how pre-service teachers made use of a virtual learning environment provided by an online simulation to link knowledge from university coursework with field experience. This inquiry also examined if/how experience with the online simulation contributed to the development of pre-service teachers’ professional identity. This inquiry focused on two cohorts of pre-service teachers enrolled in a Bachelor of Teaching (both first and third-year) at the University of Wollongong. These cohorts were chosen, as the quality and quantity of experience and knowledge of each cohort were a contributing factor to their understanding of their role as a teacher and the development of their professional identity. Thus, by sampling both the first and final year cohorts these factors were taken into consideration, which thus enabled a comparative case analysis.

Further, this inquiry was a qualitative investigation located within the Interpretivist Paradigm. There were two types of data, secondary and primary. These data informed the researcher’s understanding of andragogy (see figure 3.2).



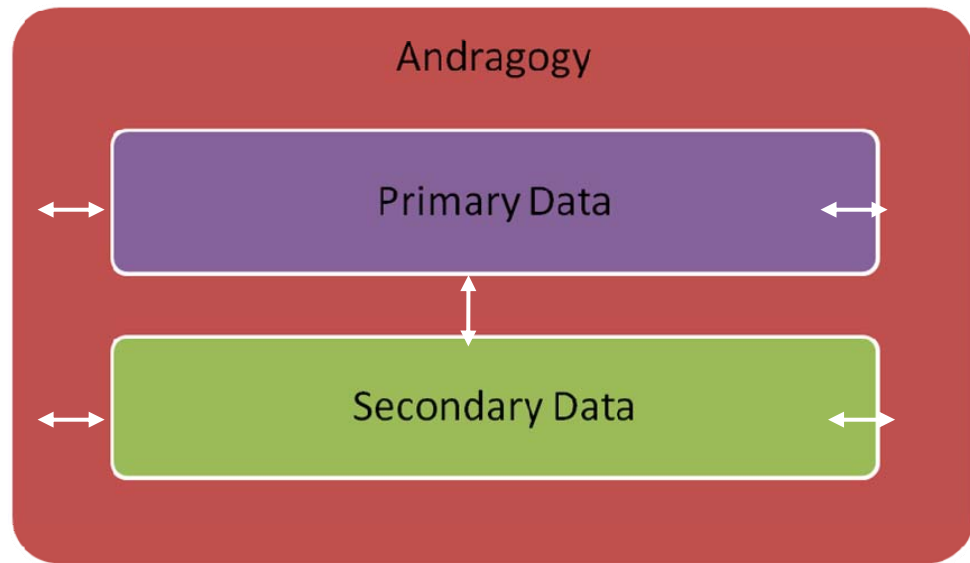


Figure 3.2: Data Type to Inform Andragogy

In explanation, the secondary data provided the context of the study. This included information regarding the participants (via survey data and interview data), the degree in which the participants are enrolled, Bachelor of Teaching (via document analysis and the researcher's knowledge of the degree), and the ClassSim (via the researcher's knowledge of the virtual learning environment). The secondary data were used to inform the primary data collection. The primary data provided information about the participants' engagement with ClassSim (via the collection of 'Thinking Space' artefacts), interviews, observations, and each participant's history trail) and field experience (via field experience reflection artefacts, and interviews). These data were used to inform the researcher's understanding of andragogy. Figure 3.3 illustrates each data collection technique in connection to how it was used to inform the researcher throughout this inquiry.

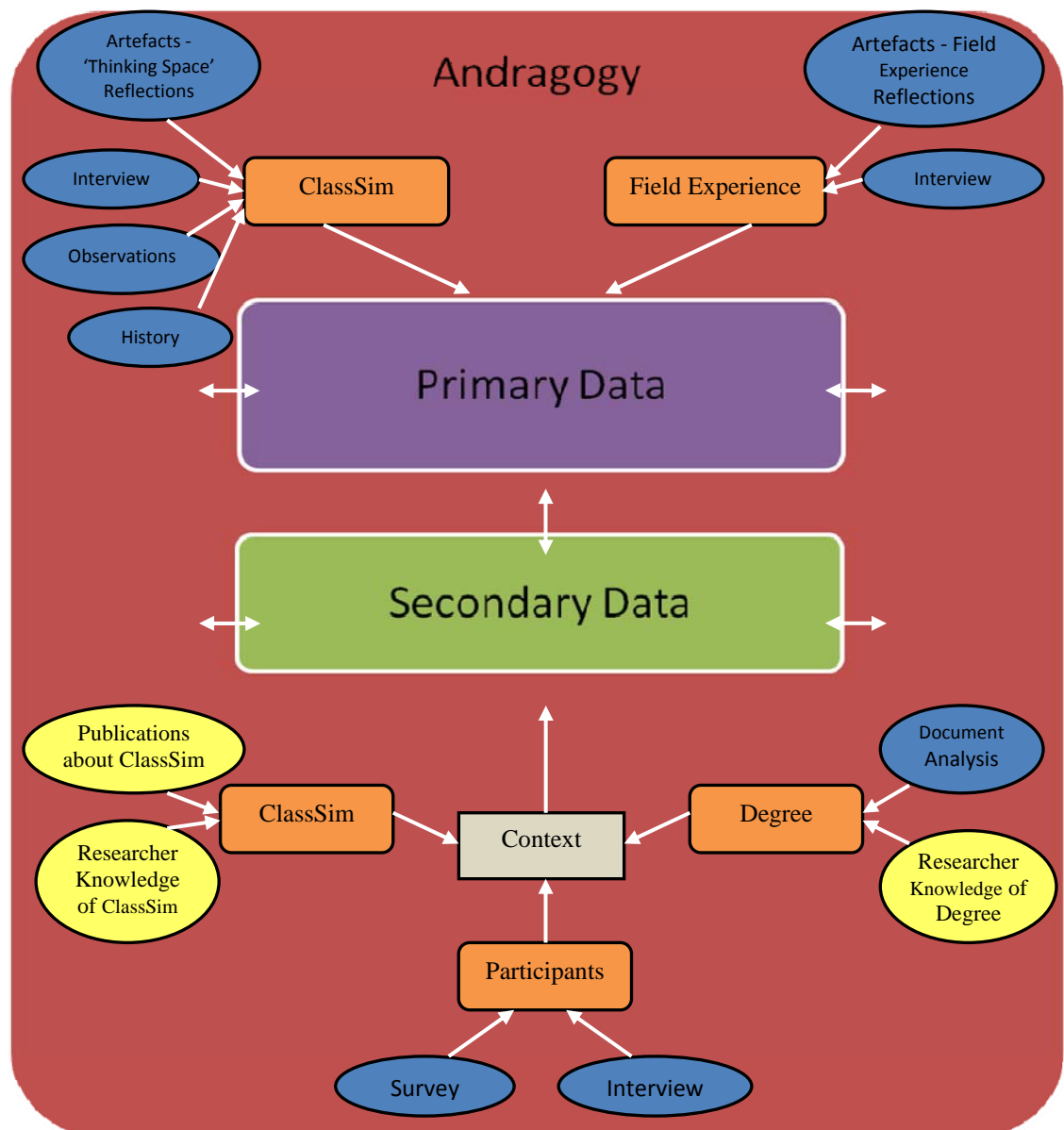


Figure 3.3: Data Type in Connection with Data Collection Procedures to Inform Andragogy

### **Data Collection in Relation to Principles of Andragogy and Research Questions**

As previously discussed, the secondary data were used to inform the context of the research, whereas the primary data were used to inform the researcher's understanding of andragogy in relation to this inquiry. There are five principles of andragogy (Knowles, 1984). These include 'Readiness', 'Orientation', 'Motivation', 'Experience', and 'Self Concept'. Interview data were the core data used, and were drawn upon during the analysis of each of the principles of andragogy. Artefact data (such as field experience reflections and 'Thinking Space' reflections) were used as support data when examining 'Self Concept', 'Orientation', and 'Motivation'. Observation data were used as support data when examining 'Self concept'. Table 3.2 illustrates which principles of andragogy were drawn upon when discussing each of the research questions of this inquiry.

Main Research Question	Sub Research Questions	Principle of Andragogy	Aspect of Principle
How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?	What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?	'Readiness'	Value to Learning
		'Orientation'	Relevant Scenarios
		'Motivation'	Value
		'Experience'	Previous Knowledge and Experience
			Reflecting on Experience
		'Self Concept'	Professional Identity
	In what ways can the virtual environment of ClassSim support the principles of adult learning?	'Readiness'	Purpose of Engagement
			Changing Role from Student to Teacher
		'Motivation'	Success
			Value
			Volition
			Enjoyment
		'Self Concept'	Structure and Support of Learning Experiences
			Professional Identity
	In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?	'Readiness'	Purpose of Engagement
			Timing of Engagement
		'Orientation'	Need for new knowledge
		'Experience'	Reflecting on Experience
		'Self Concept'	Professional Identity

Table 3.2: Research Questions in Connection with Principles of Andragogy

Tables 3.3, 3.4, 3.5, 3.6 and 3.7 explain the relationship between the data collection methods and the andragogy theoretical framework.

<b>‘Readiness’</b>		
<b>Data collection procedure used</b>	<b>Aspects of ‘Readiness’</b>	<b>How data were collected about each aspect</b>
Interview	Purpose of Engagement	The researcher asked the participants if they found their engagement with ClassSim useful and what they felt was the purpose of ClassSim was.
	Value to Learning	The researcher asked about the connections the participants were able to make between their engagement with ClassSim and university coursework.
	Changing role from Student to Teacher	During interviews comments were made by the participants stating that their engagement with ClassSim facilitated their change in role from student to teacher via the scenarios and the decision-making opportunities they were presented with.
	Timing of Engagement	Comments were made during interviews, which suggested that the participants were either induced to learn about a certain topic/area in teacher education via engagement with ClassSim, or the scenarios presented in ClassSim coincided with their developmental stage of learning.

Table 3.3: Data Collection in Connection with ‘Readiness’

<b>‘Orientation’</b>		
<b>Data collection procedure used</b>	<b>Aspects of ‘Orientation’</b>	<b>How data were collected about each aspect</b>
Interview	Relevant scenarios	The participants were asked during interviews if there were any similarities between what they had experienced in a ‘real’ classroom and what they had experienced while engaging with ClassSim.
	Need for new knowledge	During interviews participants commented on areas in their knowledge and/or skill base that required further development.
Artefact	Relevant scenarios	Participants made comment within their ‘Thinking Space’ regarding similarities they noticed between what they were experiencing in ClassSim and had previously experienced during field experience.
	Need for new knowledge	Participants made comment in their ‘Thinking Space’ and in the field experience reflections about decisions they considered they did not know enough about in order to make a decision successfully.

Table 3.4: Data Collection in Connection with ‘Orientation’

<b>‘Motivation’</b>		
<b>Data collection procedure used</b>	<b>Aspects of ‘Motivation’</b>	<b>How data were collected about each aspect</b>
Interview	Success	Participants made note of the success they felt as they engaged with ClassSim. This success came in the form of obtaining new valuable knowledge and receiving feedback via the ‘Student Updates’.
	Volition	Participants commented on their ability to make decisions in their virtual classroom as opposed to the limited number of decision-making opportunities while on field experience. Other participants commented on the restrictiveness of the decision-making opportunities within ClassSim; often suggested they needed more options.
	Value	The participants explained during interviews that they received valuable knowledge during their engagement with ClassSim and were able to make connections to their field experience and their university coursework. Participants also made comment on how their engagement with ClassSim could be altered to bring more value to their learning.
	Enjoyment	During interviews participants often likened ClassSim to a game to play and commented on their experience with ClassSim as being either a pleasurable experience or not.
Artefact	Success	Participants made comment in their ‘Thinking Space’ why they believed a lesson was a success. They also used their ‘Thinking Spaces’ to note the reaction of the targeted students to their decisions.
	Volition	Participants used their ‘Thinking Space’ to suggest alternative options to the decision-making opportunities, often making comment on the restrictive nature of these decisions.
	Value	In their field experience reflections participants made comment about strategies they implemented during field experience obtained via their engagement with ClassSim.

Table 3.5: Data Collection in Connection with ‘Motivation’

<b>‘Experience’</b>		
<b>Data collection procedure used</b>	<b>Aspects of ‘Experience’</b>	<b>How data were collected about each aspect</b>
Interview	Previous knowledge and experience	During interviews the participants identified when and where they drew their knowledge and experience from when faced with a teacher/classroom related task/problem.
	Reflection	Participants were able to identify their assumptions about teaching and often assessed these assumptions during interviews with the researcher. During interviews some participants also explained their use of their ‘Thinking Space’. They suggested that they gain a better understanding of their learning by returning to their reflections and re-reflecting.
Artefact	Previous knowledge and experience	In their ‘Thinking Spaces’ participants commented on strategies they have seen during their previous field experiences. Participants also rationalised their decisions by drawing upon their previous field experiences.
	Reflection	The participants used their ‘Thinking Spaces’ to articulate their thought processes and track their professional learning.

Table 3.6: Data Collection in Connection with ‘Experience’



<b>‘Self Concept’</b>		
<b>Data collection procedure used</b>	<b>Aspects of ‘Self Concept’</b>	<b>How data were collected about each aspect</b>
Interview	Structure and support of learning experiences	Participants were able to indentify when they utilised the structure (non-linear design) and support (summary material) of the ClassSim to further their knowledge and direct their learning.
	Professional identity	During interviews participants remarked on their transition of self concept from student to teacher. They also explained their emergent beliefs about their developing teaching philosophy.
Observation	Structure and support of learning experiences	Observations were made by the researcher regarding when the participants utilised the structure (non-linear design) and support (summary material) of the ClassSim to further their knowledge and direct their learning. These observations supported the interview data.
Artefact	Professional identity	The participants made notes in their ‘Thinking Space’ and field experience reflections about their emergent beliefs about their developing teaching philosophy with reference to what they were observing in ClassSim and during their field experience.

Table 3.7: Data Collection in Connection with ‘Self Concept’

## How ClassSim Relates to Pre-service Teacher Current Subjects

Figures 3.4 and 3.5 provide a conceptual diagram of when ClassSim was integrated into the ‘Professional Practice’ subjects for the 1<sup>st</sup> and 3<sup>rd</sup> year pre-service teachers. The aim of the figure is to visually represent and highlight when the pre-service teacher participants encountered certain concepts during their pre-service teacher education (theory) and when they had practical experience (ClassSim and field experience). The top level of each diagram provides the subject name (‘Professional Practice’), the middle level provides an outline of the theories and concepts taught/learnt within the subject (in chronological order), and the bottom level depicts when the pre-service teachers engaged with ClassSim and had their field experience.

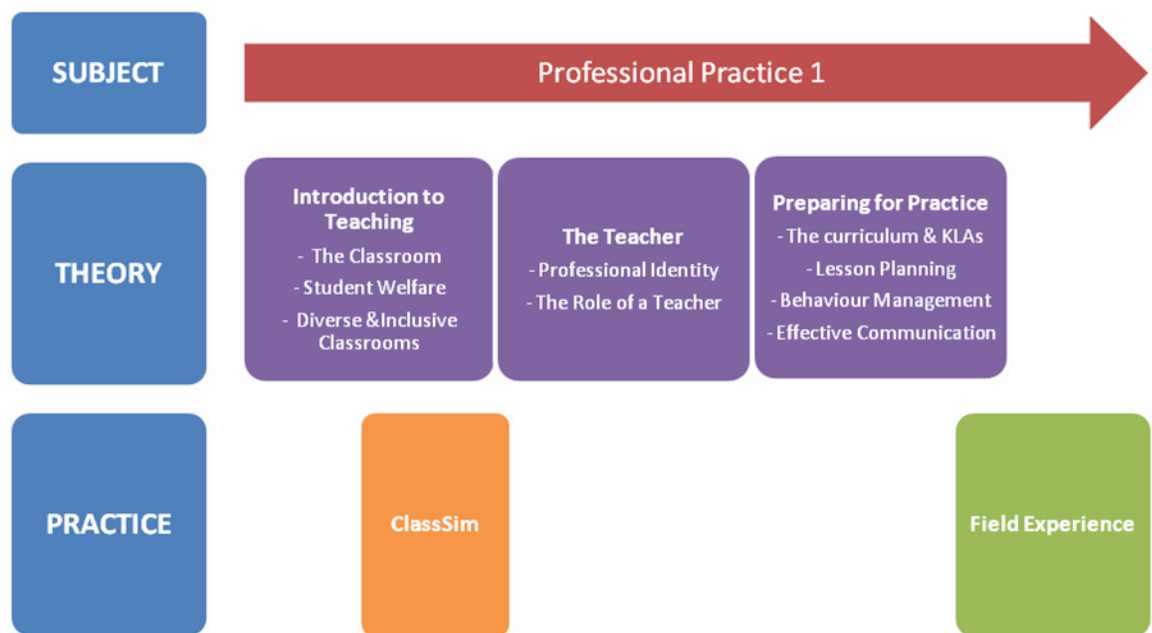


Figure 3.4: When and how ClassSim was integrated into the 1<sup>st</sup> year ‘Professional Practice’ subject

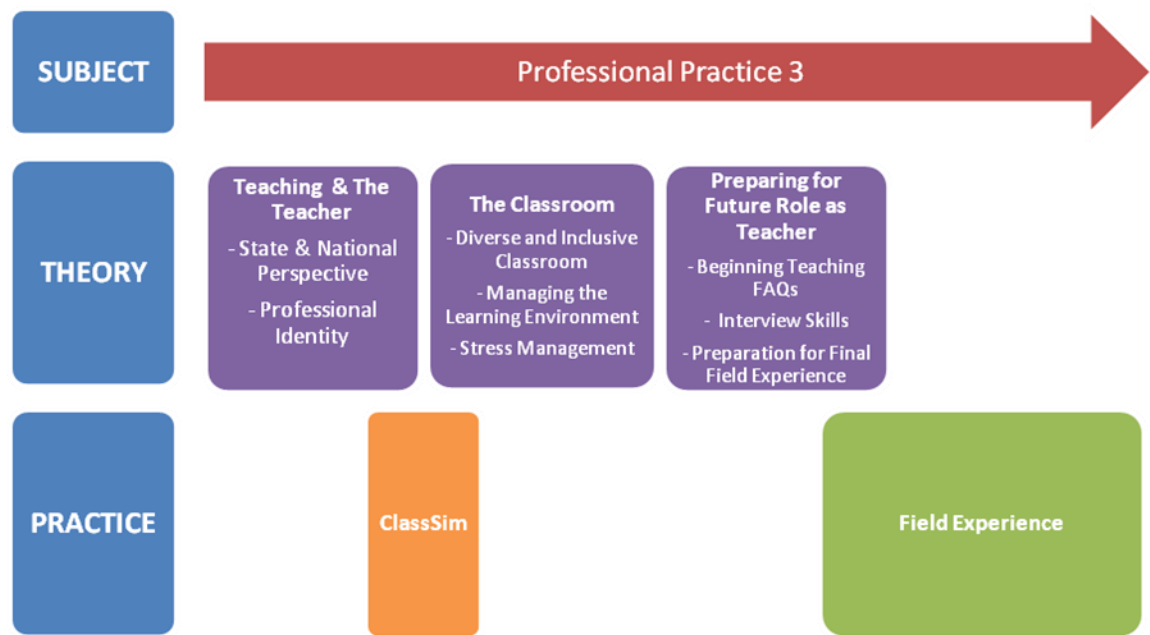


Figure 3.5: When and how ClassSim was integrated into the 3<sup>rd</sup> year ‘Professional Practice’ subject

### Data Collection Procedures

Each methodological procedure was selected in considered response to the research questions and will be briefly discussed below with links to the context of this inquiry.

#### Semi-Structured Interviews

Bogdan and Biklen (1998:93) describe an interview as a purposeful conversation between two or more people that is directed by one person in order to get information from the other. Further, they suggest that interviews are “used to gather descriptive data in the subjects’ own words so that the researcher can develop insights on how subjects interpret some piece of the world” (Bogdan & Biklen, 1998:94). During this inquiry the researcher met with the participants from both cohorts for two interviews (after they used ClassSim and again after their field experience). The purpose of the first interview was to gain understanding of the participants’ background and gain further insight into

their initial use of the virtual learning environment. The purpose of the second interview was to identify if/how the pre-service teachers were making connections between their university coursework and field experience. Gall, Borg and Gall (1996) suggest that there are three basic approaches to the structure of qualitative research interviews including, structured interviews, semi-structured interviews and unstructured interviews. In regard to this study a semi-structured approach was used. Semi-structured interviews lie somewhere between structured and unstructured interviews, and contain elements of both. Sarantakos (1998:247) believes that the extent to which interviews are structured or unstructured “depends on the research topic and purpose, resources, methodological standards and preferences, and the type of information sought, which of course is determined by the research objective”. Semi-structured interviewing was a primary source of data for both cohorts of participants in this inquiry because they are in-depth, allowing time for the pre-service teachers to explore and make explicit their thought, feelings, beliefs and perspectives, and to identify connections between these.

Patton (1990:283) explains the main distinguishable characteristic of a semi-structured interview is that the interviewer uses an ‘interview guide’ which “provides topics or subject areas with which the interviewer is free to explore, probe, and ask questions that will elucidate and illuminate that particular subject”. Yin (2003) refers to this type of interview as a ‘guided conversation’ utilising an interview guide. The interview guide is comprised of a set of questions that assist the interviewer in guiding the discussion but is flexible enough in that it provides the opportunity for the interviewer to ask further questions about topics that may arise throughout the course of the interview (del Barrio, Gutierrez, Hoyos, Barrios, & van der Meulen, 1999). In this inquiry, an interview guide (see appendices K to M) was utilised during all semi-structured interviews in order to guide the researchers’ questioning but was flexible enough to allow the researcher to probe for further information about issues and topics that arose. Burns (2000:424) suggests the use of an interview guide as a way to provide “direction to the interview so that the content focuses on the crucial issues of the study”. Furthermore, Burns (2000:424) believes that the use of an interview script “permits greater flexibility than the close-ended type and permits a more valid response from the informant’s perception of reality”. The researcher designed individual interview guides unique to each participant but was based upon a general scaffold. These questions centred upon both

the research questions and previous data collected from the participant and were flexible enough to allow the researcher to probe for further details to gain a better understanding of the responses given.

An important aspect of semi-structured interviewing is the use of probing questions. Clandinin and Connelly (1999:168) suggest that the researcher's responses during an interview "may constitute a probe into experience that takes the representation of experience far beyond what is possible in an interview". They also suggest that probing is most successful when it occurs in "situations of mutual trust, listening and caring for the experience described by the other" (Connelly & Clandinin, 1999:168). Bogdan and Biklen (1982:97) further highlight the notion of trust during an interview when they suggest "good interviews are those in which the subjects are at ease and talk freely about their points of view". In other words, a successful interview requires the development of trust, collegiality and friendship between interviewer and respondent. Therefore an important aspect of the initial interview with the participants from both cohorts was to develop a rapport. This was done through the use of a number of techniques, including a smile (demonstrating friendliness, warmth and approachability), eye contact, use of appropriate non-verbal cues (demonstrating openness to the participants' ideas), enthusiasm for topics that concerned the participant (e.g. their background and experiences), and respect for the participants' right to an opinion.

### **Observations**

Eichelberger (1989) believes that whenever a researcher participates in and studies a situation, observation occurs. Adler and Adler (1994) state that qualitative observation occurs in naturalistic settings without using pre-determined categories of measurement or response. Patton (1990:31) agrees with this assessment, stating that observations should be unadulterated description and quotations free from judgement or interpretation, as the overall purpose of observation is to "take the reader into the setting". During this inquiry the researcher noted observations of the participant pre-service teachers from both cohorts. The initial observations noted the settings in great

detail and comprehensive descriptions were made of the participants' engagement in the virtual learning environment.

During qualitative observations the researcher is the instrument of data collection and as such the researcher decides "what to observe and what to write down" (Mertens, 1998:175). Guba and Lincoln (1981:113) comment on the skill, competence, and rigor of the researcher as the instrument of data collection.

[The] inquirer is himself [*sic*] the instrument, changes resulting from fatigue, shifts in knowledge, and cooptation, as well as variations resulting from differences in training, skill, and experience among different 'instruments,' easily occur. But this loss in rigor is more than offset by the flexibility, insight, and ability to build on tacit knowledge that is the peculiar province of the human instrument.

Burns (2000) also notes that the major problems associated with qualitative observation are concerned with the use of the researcher as the instrument as there is a potential for bias. "The investigator may become too closely involved and lose detachment, or assume advocacy roles detrimental to unprejudiced reporting" (Burns, 2000:467). To aid the researcher in obtaining unbiased observations, audio tape recorders were placed near the participant as they used ClassSim. This enabled a full account of what was said while the participants interacted with the virtual learning environment. In addition, Bogdan and Biklen (1992:108) explain that field notes contain both descriptive and reflective information, both important to the research process. Descriptive field notes are concerned with capturing "a word-picture of the setting, people, actions, and conversations as observed", whereas reflective notes look to capture "more of the observer's frame of mind, ideas, and concerns". In this inquiry both types of field notes were taken. Descriptive observations allowed the researcher to capture the setting, participant behaviours, participant use of ClassSim, and conversations held whilst engaging with the virtual environment, whereas reflective notes enabled the researcher to make links to research questions, identify emerging themes, and reflect upon issues of concern.

It is suggested by Connelly and Clandinin (1988:56) that the researcher should "keep notes on as many activities, events, exchanges, materials, conversations, instructions,

bodily movements, facial expressions, and uses of time, space, materials as possible”. However, Burns (2000:430) suggests that during the first days of a study the researcher will often take note of everything, but as the study becomes more refined and focused the researcher will become more selective when writing field notes. Overall, Patton (1990:10) suggests that when making observations in qualitative research, the researcher should collect “detailed descriptions of people’s activities, behaviors, actions, and the full range of interpersonal interactions and organizational processes”. In response to this limitation, the researcher utilised audio-tape recordings of the participants’ engagement with the ClassSim and interaction with each other. Bogdan and Biklen (1998) support the use of such a recording device to support the data collection process, suggesting that they have great potential to aid qualitative researchers in data collection if it is “used in an uncomplicated and unobtrusive manner” (Bogdan & Biklen, 1998:102).

### **Monitoring Student Engagement**

As the participants engaged with ClassSim individual engagement history trails were recorded on ClassSim’s server and were downloaded a week after the participant’s allocated day of engagement (in class). This information outlined each user’s episode choice and decision-making opportunities; however they do not indicate time spent on each page or the user’s access to support materials and ‘Thinking Space’. Rather, these history trails were used to gain a better understanding of each participant’s use of ClassSim, how they dealt with classroom interruptions and behaviour management issues that arose, and how they structured their literacy block at this point of their university studies. This information helped to build an understanding of how each participant and in turn, how the different year group, might approach situations.

## **Artefacts**

The artefacts collected throughout this inquiry can be defined as personal documents, as they are first-person narratives that describe an individual's actions, experiences, and beliefs (Plummer, 1983). It is suggested that the criterion for calling written material personal documents is that it is self-revealing of a person's view of experiences (Allport, 1942). Mertens (1998:324) suggests that qualitative researchers collect artefacts such as personal documents to gather the "necessary background of the situation and insights into the dynamics of everyday functioning". Furthermore, Gottschalk, Kluckhohn, and Angell (1945:178) suggest that the overall aim of collecting such materials is to "obtain detailed evidence as to how social situations appear to actors in them and what meanings various factors have for participants".

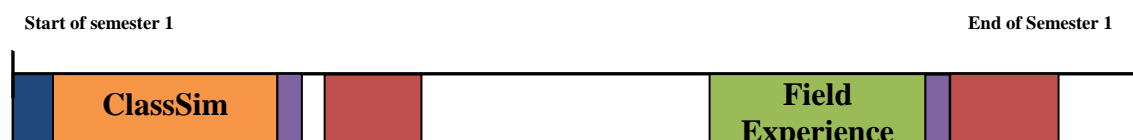
The personal documents collected consist of reflective journals ('Thinking Space' entries and field experience reflections) which allow the pre-service teachers to "determine their own focus and what they want to understand, and to have their ideas seriously valued as knowledge being personally constructed" (Francis, 1995:230). Therefore collection of such artefacts allowed the researcher to gain insight into both cohorts of pre-service teachers' "personal construct which is continuously established in the individual through a series of diverse events [such as practical experience, reading, listening, observing other people's practice] which are mixed together or integrated with the changing perspective provided by the individual's values and ideals" (Handal & Lauvas, 1987:8). Overall, it is believed that data gathered from written sources, such as reflective journals have the potential to contribute different perspectives from data gathered through conversational interviews (Bogdan & Biklen, 1992). Thus, reflective journals ('Thinking Space' entries and field experience reflections) were collected from both cohorts of participants in order to gain insight into the participants' personal understanding of their knowledge and their perception of how this knowledge was constructed.



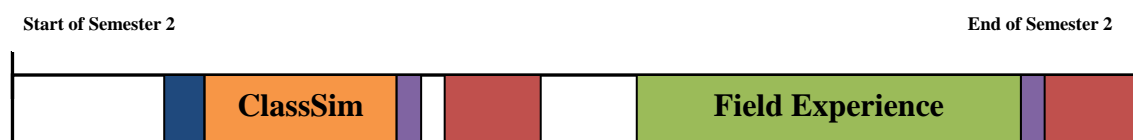
## Phases of Data Collection

There were two cohorts of participants (first-year students and third-year students, enrolled in the Bachelor of Teaching). Data collection began with the use of a demographic survey to aid in the purposive selection of the participants. Observations of the pre-service teacher participants, whilst they engaged with the classroom simulation and interacted with their peers, were recorded as handwritten field notes supported by audio-tape recordings. This was followed by the collection of artefacts ('Thinking Space' entries) and a semi-structured interview. The participants then continued with their usual university coursework and field experiences. At the conclusion of their field experience the researcher collected the participant field experience reflections (artefacts) and held a final semi-structured interview. The structure of data collection for this inquiry is outlined in Figure 3.6 as a timeline. The data collection and data analysis procedures were an on-going, continuous process throughout the course of the study.

### First Year Students (2007 - Semester 1)



### Third Year Students (2007 - Semester 2)



Key:



Figure 3.6: Data Collection Timeline

Figure 3.7 details the data collection procedures used during the course of this inquiry. There were three distinct stages dealing with 3 separate cohorts (pilot participants, 1<sup>st</sup> year participants, and 3<sup>rd</sup> year participants). Within Stages Two and Three, Phases One to Six were followed. These phases will be described in detail later in this chapter.

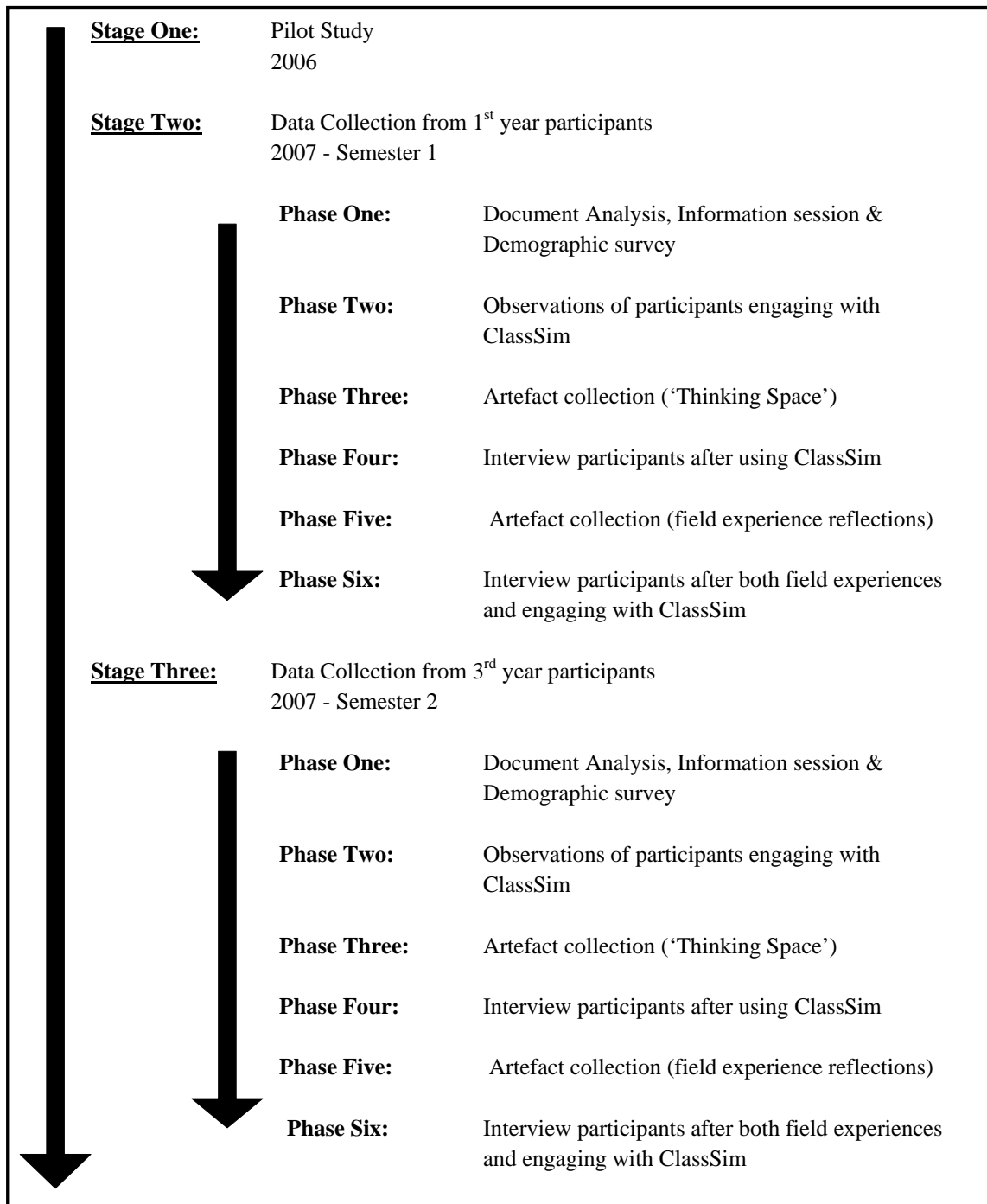


Figure 3.7: Phases of Data Collection

An audit trail of the data collection procedures can be found in appendix R.

## **Pilot Study**

### **Purpose and Setting**

In 2006, a pilot study was conducted. The purpose of this pilot study was to trial the prepared demographic surveys, semi-structured interview questions, observation guide, and information and consent forms for ambiguity. The literature suggests that this should be done with individuals similar to the intended participants (Wiersma, 1995; Mertens, 1998); therefore the first-year cohort of pre-service teachers enrolled in the Bachelor of Teaching degree was selected.

### **Information Session and Demographic Survey (Participant Recruitment)**

An information session (see appendix E) was held for the potential pilot study participants. During this time a demographic survey (see appendix F) was distributed with the purpose of obtaining general demographic information of the overall cohort of pre-service teachers enrolled in their first year of the Bachelor of Teaching, and to recruit participants for the pilot study. Those who agreed to participate were given an information sheet (see appendix P) to read and keep and asked to sign a consent form (see appendix Q). From the data collected in the demographical surveys three participants were selected to represent the range of demographic data reported by the students.

### **Observations of Participants Engaging with ClassSim**

The first-year pre-service teacher pilot study participants used ClassSim for a one-hour period, as part of their usual class schedule. During this time the researcher recorded

observations of their interaction with their peers and engagement with the simulation (see appendix J for the observation guide). As a result of this pilot study the developed observation guide did not change, however the researcher decided to make audio-recordings of the peer interactions to better support the observations made.

### **Artefact Collection ('Thinking Space')**

During the use of the classroom simulation the pre-service teachers were required to use the electronic journal embedded within the software ('Thinking Space') to reflect upon the teaching decisions made throughout the simulation and begin to articulate and rationalise these choices. At the conclusion of their engagement with ClassSim the pilot study participants copied their 'Thinking Space' entries into a Microsoft Word document and emailed the document to the researcher. As a precaution, the researcher took note of the participants' user name at login, so if there was a problem with the participant/researcher's email account or the document, the participants' 'Thinking Space' could be downloaded directly from the server (where ClassSim is housed). This method of artefact collection was effective and was not altered for the main inquiry.

### **Interview Participants after using ClassSim**

After their engagement with the virtual learning environment (ClassSim) the researcher contacted the three pilot study participants and organised an interview with each. The interviews were conducted at mutually agreeable times for approximately half an hour. An interview protocol for the pilot interview can be found in appendix K. The data collected from the interviews were transcribed, summarised and analysed for emerging themes. As a result the researcher was able to identify areas, which needed to be refined, thus the protocol was altered slightly to include a question about the participants' perceptions on how ClassSim contributed to their knowledge about the theory of teaching (directly linking to the main research question). The altered interview protocol for the main inquiry can be found in appendix L. As part of this interview, the pilot participants were also encouraged to note any ambiguities with the demographic survey, information sheet and consent form. No ambiguities were reported.

### **Interview Participants after both Engaging with ClassSim and Field Experiences**

After the pilot study participants finished their first field experience the researcher contacted them again and arranged a final interview to discuss their experiences, their first semester of university and their use of ClassSim. These interviews were held for approximately half an hour. The interview protocol can be found in appendix M. An important outcome of this process was that the participants appeared unable to effectively articulate links between their university studies, use of ClassSim, and their field experiences. They were able to describe each experience in isolation but were unable to make connections among them. At this point the collection of field experience reflections was identified as an important step in helping the pre-service teachers begin to create connections between their knowledge and experiences before the interview. Boyd and Fales (1983:100) define reflection as “the process of creating and clarifying the meaning of experience (present or past) in terms of self (self in relation to self and self in relation to the world)”. Further they explain that the outcome of the reflection process is a changed conceptual perspective. They also state that the, “process of reflection is the core difference between whether a person repeats the same experience several times, becoming highly proficient at one behaviour or learns from the experience in such a way that he or she is cognitively or affectively changed” (Boyd & Fales, 1983:100). That is, by using the reflective process, learners have a greater chance of being able to generalise their knowledge so that it can be applied to new situations and experiences. Furthermore they are able to reflect-in-action (during field experiences), reflect-on-action (after field experiences making links between their university coursework and field experiences) and reflect on the reflection-in-action (Schön, 1987). Therefore the collection of field experience reflections (artefacts) was included as a phase in the collection of data in the subsequent inquiry.

### **Phase One: Document Analysis, Information Session and Demographic Survey (Participant Recruitment)**

## **Document Analysis**

The subject, 'Professional Practice' is a core subject the pre-service teachers must complete each year (i.e. 'Professional Practice', 'Professional Practice 2', and 'Professional Practice 3'). The coordinators of 'Professional Practice' 1 and 3 were contacted and the researcher requested a copy of the subject outlines. This information was used to provide the researcher the necessary background information about the subjects and thus provide some insight into the pre-service teacher participants' focus of study throughout the inquiry.

## **Purpose and Setting of Information Session**

The participants within this research were pre-service teachers enrolled in a Bachelor of Education (Primary) degree. Seventeen pre-service teachers comprise the overall cohort of participants for this study recruited from both the first and last years of their study (ten participants comprised the first year cohort and ten participants comprised the third year cohort – three of whom withdrew from the study). The researcher initially approached both cohorts of the potential participants during a mass lecture of a core subject ('Professional Practice') at the beginning of the semester. The first year cohort was addressed in the beginning of first semester and the third year cohort was addressed in the third week of the second semester. During these initial information sessions the researcher detailed her background, provided a brief overview of ClassSim, and outlined what participation in the research would entail. An outline of the initial information session can be found in appendix E. Demographic surveys were distributed (more detail in the following section) and those chosen to participate were given an information sheet (see appendix P) to read and keep and asked to provide informed consent (see appendix Q).

## **Demographic Survey**

Surveys are commonly the most used method for gathering data at a particular time. According to Cohen and Manion (1994:83) surveys “describe the nature of existing

conditions, or identifying standards against which existence conditions ... can be compared or determining the relationship that exist between specific events”. A survey was distributed to all who attended the mass lectures (‘Professional Practice’ first and third years) in order to gain data on the overall demography of students enrolled in the Bachelor of Teaching (both from their first year of study and from their third year of study). Wiersma (1995:176) believes that background or demographic information about the participant is “important in that it identifies the individual in terms of classifying variables for the analysis”. The survey also served as a participant recruitment form for those interested in participating in the research. Those wanting to participate were able to provide their contact information on the survey before returning it to the researcher. Both cohorts were given similar surveys; however some questions were modified as the different year groups of individuals bring different experiences (a copy of the demographic survey used for the first year students can be found in appendix F. A copy of the demographic survey used for third year students can be found in appendix G).

### **Purposive Sampling**

From those who agreed to participate, a purposive sample was used to ensure the collection of data from the widest range of personal experiences and backgrounds. Kerlinger (1986) explains that purposive sampling is characterised by the use of judgment and a deliberate effort to obtain representative samples by including typical areas or groups in the sample. Merriam (1998:61) describes purposive sampling as criterion-based selection of information-rich cases from which a researcher can discover, understand and gain more insight into issues central to the inquiry. Furthermore LeCompte and Preissle (1993:69) consider criterion-based selection as the starting point for all research.

The purposive sampling ensured that the participants selected were representative of the pre-service teachers enrolled in the Bachelor of Teaching (first and third years). Purposive sampling was done through the use of a selection matrix constructed on the basis of age, gender, field experiences and average mark obtained throughout their study

(see appendices H & I). Ary, Jacobs and Razavieh (2002:428) believe that purposive samples provide the researcher with “maximum insight and understanding of what they are studying”. Wallen and Fraenkel (2001:433) suggest that purposive sampling increases the likelihood that the variability so common in social phenomena will thereby be represented in the sample. While the collection of evidence-rich data was a major consideration when selecting participants for this inquiry, it was also desirable to reduce repetitious reporting of evidence from participants with similar knowledge and experience.

Forty-six first year pre-service teachers filled out the demographic surveys and returned them. Ten (three male and seven female) were selected to be participants to represent the first year cohort. Twenty-nine third year pre-service teachers filled out and returned the demographic survey. Of the twenty-nine, ten (three male and seven female) were selected to participate; however three of these participants withdrew their participation (before data collection) due to family and work commitments. Thus seven (two male and five female) participants represented the third year cohort of pre-service teachers. The seventeen participants were each observed whilst engaging with the classroom simulation and interacting with their peers, were involved in two semi-structured interviews, and gave the researcher access to their ‘Thinking Space’ entries and field experience reflections. Figure 3.8 represents the purposive selection of participants for this study.



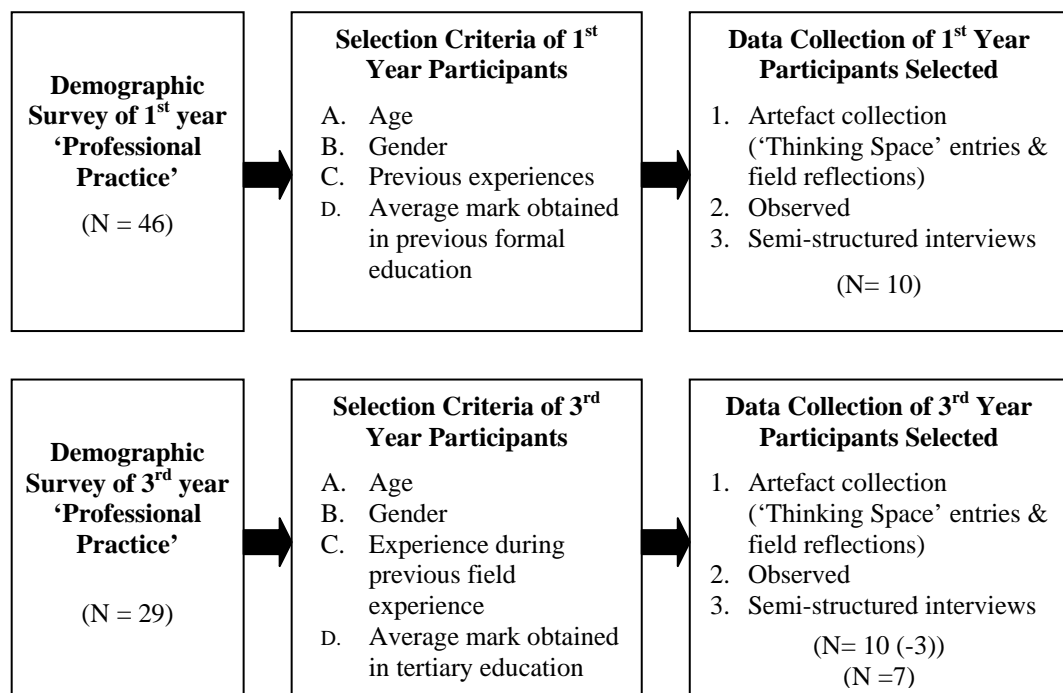


Figure 3.8: Purposive Selection of Participants

### The Participants

Seventeen seemed an appropriate number of participants for several reasons. First, it enabled diversity in terms of age, academic and employment background, prior experiences with children and general life experiences. This diversity yielded a broad range of perspectives and helped to illuminate connections and patterns (Morse, 1994; Patton, 1990). Second, it provided a rich array of data, while enabling the amount of data collected to remain manageable within the constraints of the researcher's personal and professional commitments. Third, it allowed for the possibility of a small number of pre-service teachers to withdraw from the inquiry without affecting the investigation's viability. A brief overview of the first and third-year participants involved in the study can be found in the following tables (Table 3.8 & 3.9).

<b>Name (pseudonym)</b>	<b>Age</b>	<b>Educational history</b>	<b>Average mark obtained in previous studies</b>	<b>Prior experiences with children</b>
Kim	17 - 19	High school	50 - 64%	Siblings
Leonie	17 - 19	High school	85% +	Siblings
Rachael	17 - 19	Other - college	75 - 84%	Tutor (primary maths)
Sarah	20 - 22	High school	85% +	Helper in parent's classroom
Serena	23 - 25	TAFE	75 - 84%	Church group leader
Kellie	26 +	High school	50 - 64%	Own children & helper in child's classroom
Jasmine	26 +	TAFE	85% +	Swimming teacher
Daniel	17 - 19	High school	65 - 74%	No experience
Michael	17 - 19	High school	75 - 84%	Karate instructor
Bruce	26 +	TAFE	65 - 74%	Sibling & children of own

Table 3.8: Overview of First-Year Participants

<b>Name (pseudonym)</b>	<b>Age</b>	<b>Educational history</b>	<b>Average mark obtained in tertiary studies</b>	<b>Self-reported rating of past field experiences</b>
Mia	20 - 22	High school	85% +	Fair (2)
Lauren	20 - 22	High school	85% +	Good (4)
Zoe	20 - 22	High school	65 - 74%	Good (4)
Isabella	23 - 25	Bachelor of Arts	85% +	Excellent (5)
Marie	26 +	TAFE	65 - 74%	Excellent (5)
Mark	20 - 22	High school	75 - 84%	Average (3)
Ross	26 +	High school	75 - 84%	Good (4)

Table 3.9: Overview of Third-Year Participants

## **Phase Two: Observations of Participants Engaging with ClassSim**

### **Purpose and Setting**

During the second phase of data collection the participants used ClassSim as part of their usual class schedule. This occurred in the Multimedia Computer Laboratory at the University for a one-hour period. The first year participants used ClassSim near the beginning of their first semester of study (week 2 of semester 1, 2007) prior to their first field experience, in order to enhance their understanding of the complexities of the classroom environment, prior to field experience. The third year participants engaged with ClassSim during their final semester of study (week 3 of semester 2, 2007) prior to their final field experience. The purpose of their engagement was to utilise ClassSim as a reflective tool to help identify areas for future professional growth as they reflected upon all that they know about classrooms. The differing dates were scheduled in order to coincide with each cohort's corresponding field experience. During this one-hour session the researcher took hand-written notes on the participants' engagement with ClassSim, recorded their interaction between participants and detailed the setting and investigator's impressions. The field notes also included the "investigator's reflections on the conversation and setting", as suggested by Burns (2000:430). To aid in the observations, the researcher referred to an observation guide (appendix J), based upon the research sub-questions with the purpose of focusing the observations made during each session.

### **Capturing Observations**

Bogdan and Biklen (1998:121) identify that researcher field notes are central to participant observation as they "represent the researcher's best effort to objectively record the details of what has occurred in the field". However, as the researcher is the instrument of data collection, they are fallible. It is suggested that the setting can never be completely captured during observations and the descriptions recorded represent the researcher's choices and judgements to some degree; therefore a qualitative researcher

should endeavour to accurately depict the setting under these limitations (Bogdan & Biklen, 1998:121). To overcome this limitation and to ensure that the setting was more completely captured through researcher observation, audio recordings supported all hand-written anecdotal field notes. This ensured that a more balanced description of both the first and third-year cohorts' use of ClassSim was obtained. Those who were not participating in the study were not observed or audio-taped during these periods.

### **Role of Researcher**

The researcher observed the participants as they engaged with ClassSim and interacted with their surrounding peers. In addition, the researcher interacted with the participants and as a result, established an insider's perspective, without participating in the activity (Adler & Adler, 1994), thus taking on a peripheral-member-researcher role. While observing the participants (both cohorts) the researcher gave assistance to a number of the pre-service teachers when requested. Such assistance typically focused on troubleshooting any technological difficulties that were encountered with the use of the software. On a number of occasions the researcher also engaged in conversations with the participants in order to gain further insight into their use of ClassSim. These were recorded and later analysed.

### **Phase Three: Artefact Collection ('Thinking Space')**

#### **Purpose and Setting**

While interview data are widely recognised as useful in providing evidence of reflection, data gathered from written sources (such as reflective journals) have the potential to contribute different perspectives from data gathered through conversational interviews and participant observation (Bogdan & Biklen, 1992). Artefacts are often readily accessible and can be used to confirm information from other sources and they retain the context of the setting (Guba & Lincoln; 1981; Patton, 1990). The literature suggests that the collection of artefacts is recommended during qualitative research as

they have the potential to provide the necessary background of the situation and insights into the dynamics of everyday functioning (Gottschalk, Kluckhohn & Angell, 1945; Bogdan & Biklen, 1998; Mertens, 1998). For this reason all participant (both cohorts) 'Thinking Space' entries were collected after they used ClassSim. ClassSim's embedded cognitive tool, the 'Thinking Space', gave the users the opportunity to reflect upon their experience with ClassSim, to rationalise the decisions made, consider the consequences of these decisions, suggest alternative choices, and comment on their overall thoughts and feelings about their use of ClassSim in regard to their university studies, previous experiences, and the role of a teacher.

Both cohorts of participants' downloaded their 'Thinking Space' entries and copied these into a Microsoft Word document. These were sent via email to the researcher. As a precaution, the researcher kept a record of each participant's user name at login, so in the event of a problem (such as, with the participant/researcher's email account or the document), the participant's 'Thinking Space' could be downloaded directly from ClassSim's server. Analysis of these entries assisted the researcher in formulating questions for the next phase of the research.

#### **Phase Four: Interview Participants after Engaging with ClassSim**

##### **Purpose and Setting**

The literature suggests that interviews can be used to gain insight into the participants' thoughts, feelings and background experiences (Leydens, Moskal & Pavelich, 2004; Mertens, 1998). During the fourth phase of data collection interviews were used to develop a better understanding of the participants' beliefs and experiences and to gain a deeper understanding of the participants' experiences whilst engaging with ClassSim. The researcher used an interview guide (Yin, 2003) to assist in the interview process and the participants' own 'Thinking Space' entries to direct the discussion.

The researcher made contact with the participants and arranged the first round of one-on-one interviews at mutually convenient times. The first and third year participant

interviews were conducted in a small interview room available to staff within the Faculty of Education, equipped with a table and a number of comfortable chairs. This room provided privacy.

The literature explains that when a researcher conducts interviews the first goal should be to develop a rapport and trust relationship with the participant (Ary, Jacobs & Razavieh, 2002; Bogdan & Biklen, 1998; Eichelberger, 1989; Whyte, 1984), with the overall goal of having a “conversation between two trusting parties” (Bogdan & Biklen, 1992:47). Therefore, using this suggestion, the purpose of the initial interview was to build a rapport with the participants, establish the basis of a trust relationship, better understand the background experiences they identified in the demographic survey, and gain a deeper understanding of the participants’ experiences whilst engaging with ClassSim.

Each participant signed a consent form before any data were collected. The consent form and information sheet (see appendices P & Q) outlined the means in which interviews were to be recorded, via audio-tape. Although the consent form detailed the use of an audio-tape to record the interview proceedings, the researcher ensured that each participant was comfortable with this, before conducting the interview. The use of audio-tape recordings allowed for an accurate and complete depiction of the interview and ensured that the participant’s own words of explanation and expression were used rather than those of the researcher (Yin, 2003).

### **Semi-Structured Interview Design**

When preparing for this study the researcher designed an interview guide (see appendix L), however during each interview the researcher often probed for further details in order to gain additional information depending on the responses given. For example, when asked about the participants’ use of the cognitive tools (such as the ‘Thinking Space’, ‘Student Profiles’, ‘Student Updates’, and ‘Summaries’) some probing questions were asked about when, how, and why they decided to access them depending on what

they revealed after the initial question. This probing led to a deeper understanding of the participants' use of ClassSim.

In addition, the researcher used each of the participant's own 'Thinking Space' entries to generate follow up questions. For example, one of the third-year participants wrote copious notes about the role of a teacher in the virtual learning environment (ClassSim). This participant was then asked why this was an important issue and how ClassSim helped to better understand this role.

The semi-structured interviews were also tailored for each individual participant depending on which episodes each chose whilst engaged with the ClassSim. Data collected from the ClassSim server formed a history trail, which outlined each user's episode choice and decision-making opportunities (see appendix O for a sample history trail). These history trails were used to gain a better understanding of each participant's use of ClassSim, how they dealt with classroom interruptions and behaviour management issues that arose, and how they structured their literacy block at this point of their university studies. This information helped to build an understanding of how each participant and in turn, how the different year group, might approach situations.

## **Phase Five: Artefact Collection (Field Experience Reflections)**

### **Purpose and Setting**

The first and third-year participants were asked to make a number of structured reflections during their scheduled field experiences. The purpose of these reflections was to give the participant the opportunity to build connections between their knowledge and experiences before the final semi-structured interview and to allow the researcher to gain a better understanding of if/how these connections were formed. The researcher designed a number of guiding questions to aid the first and third-year participants whilst making these reflections (see appendix N). The participants reflected upon issues that arose whilst on field experience and articulated any connections they

made between their experiences with ClassSim, their university coursework, their current field experiences, and any previous experiences.

The participants' were given the choice of submitting hand-written notes (which were later transcribed by the researcher) or emailing the researcher their reflections in a Microsoft Word document. Analysis of these reflections assisted the researcher in formulating questions for the next phase of the research.

## **Phase Six: Interview Participants After Both Field Experiences and Engaging with ClassSim**

### **Purpose and Setting**

During the sixth phase of data collection semi-structured interviews were used to explore if/how each participant made connections among the classroom simulation (ClassSim), their university coursework, and their field experiences.

The researcher made contact with each of the participants in order to schedule the second semi-structured interview. These were conducted at convenient times in the Faculty meeting room (as previously discussed). The interview data were recorded via audio-tape, which enabled a more accurate and complete depiction of the interview and facilitated a conversational feeling.

### **Semi-Structured Interview Design**

The researcher prepared for each interview by planning an individual interview guide. This guide was unique to each participant as it not only centred on the research sub-questions, but also upon all data collected from the participant (including 'Thinking Space' reflections, field experience reflections, and the initial semi-structured interview). Throughout the course of each interview, the researcher often probed for further details to gain a better understanding of the responses given. For example, a



first-year participant stated that ClassSim prepared them for their first field experience. The researcher then utilised probing questions to further understand what aspects of ClassSim prepared them for their first field experience. It is important to note that over the course of the data collection phases a rapport developed through regular interaction, which facilitated a trusting relationship in which the participants appeared to feel comfortable enough to share their experiences and beliefs.

## **Data Analysis**

Data analysis for qualitative research is an iterative process, rather than a linear process. Figure 3.9 illustrates this process in more detail. During the data analysis process the researcher systematically organised and searched the data in order to increase understanding and to present discoveries to others (Ary, Jacobs & Razavieh, 2002). The data collection and analysis was an on-going process throughout the course of the study. The researcher worked with the data to “organise it, break it into manageable units, synthesise it, search for patterns, discover what is important and what is to be learned” (Bogdan & Biklen, 1982:145). Wallen and Fraenkel (2001:434) suggest that data analysis is commenced when the researcher has “accumulated a subset of the data, permitting him or her to look for patterns, themes, overarching ideas, and the like”.

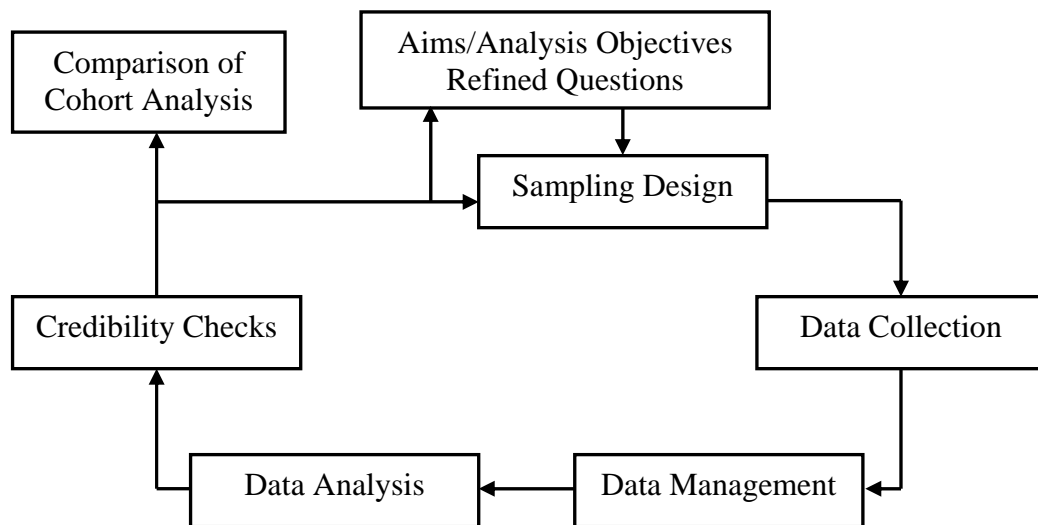


Figure 3.9: The Iterative Qualitative Process

### Data Preparation

Semi-structured interviews were audio-taped and transcribed by the researcher to provide a complete record of what has been said (Glesne, 1999) and to provide opportunity for the participants to verify the accuracy of the researcher's portrayal of the participants' position via member checking (Ary, Jacobs & Razavieh, 2002).

The participants' reflective journal entries ('Thinking Space' and field experience reflections) were downloaded and transferred into a Microsoft Word document and reformatted to support coding processes.

Data from participant observations were collected in the form of hand-written field notes. The field notes were transferred into a Microsoft Word document along with the time of each observation. Audio recording of the participants' interactions with their peers supported the observations.

All documents were labelled according to the method of collection, date collected, and participant (including name and cohort).

### **Computer-Assisted Qualitative Data Analysis**

The literature describes that before a researcher decides to utilise a computer-assisted qualitative data analysis package, he/she should consider if this analysis is best supported through the use of a computer program (Rice & Ezzy, 1999:202). Thus a number of considerations were contemplated, including program requirements, the researcher's skills, and the resources available. In particular:

- User friendliness – The researcher wanted a program that was easy to learn and once familiar with it was able to use advanced features.
- Hardware and costs – The researcher uses a Windows laptop so the program needed to be compatible. The researcher also considered what was available to researchers at the University.
- Database management – The researcher required a program that enabled ease of data entry and manipulation.
- Coding – The researcher required the software to allow for multiple readings and coding of the data, thus flexibility and ease of coding were important.
- Search and Retrieval – The researcher intended to do some exploratory research to inductively identify categories.
- Data display – The researcher wanted to be able to see the context of a coded chunk of text (see coding scheme on screen with the data).
- Memoing – The researcher needed the ability to store comments and memos and both data and codes.
- Data linking - The researcher wanted the option to use hypertext-type links between data independent of codes.
- Matrix building – The researcher needed the ability to develop analyses of the relationships between the data.
- Conceptual models – The researcher wanted the ability to map pictorially the relationships between the codes.

- Theory building – The researcher needed to be able to explore the relationships between codes to facilitate theory building.

After scrutinising the available programs the researcher decided to use NVivo7 as its coding, conceptualisation and data management features best suited the needs of the researcher (mentioned above).

### **Data Analysis Using NVivo7**

As all data were stored in Microsoft Word documents, they were imported to NVivo7 and named according to the method of collection, date collected, and participant (including name and cohort). Further information was entered in a data management aspect of NVivo7 ‘Sets’ and ‘Cases’. This advanced feature of NVivo7 allowed the researcher to organise the data into collective cases (first and third-year pre-service participants) to allow for later comparison of cases. All data were coded according to the emerging themes within data. The software tools were used to determine similarities and differences through constant comparison and contrasting procedures, and multi-layer analysis. All data gathered were analysed using processes of data reduction, data display and conclusion drawing and verification. This process is further explained below.

### **Coding**

Coding is defined by Strauss and Corbin (1990:57) as the “operation by which data is broken down, conceptualised, and put back together in new ways”. Thus, it describes a process, which researchers undergo in order to establish and build upon ideas, and eventually construct theories. Strauss and Corbin (1990) outline four key outcomes for using coding procedures: to build theory not just test it, to provide rigor in developing theory as “good” science, to help the researcher break through the bias and assumptions that are implicit in the research, and to provide the grounding, density, sensitivity and integration required to explain a theory that closely represents reality. In order to achieve these outcomes two corresponding approaches, open and axial coding, were

used in this inquiry. Open coding refers to identifying concepts in terms of their properties and dimensions, whereas axial coding explores connections between open coding categories.

Open coding was used to identify broad concepts such as: purpose, reflection, professional identity, theory-to-practice connections, and design. This was followed by axial coding to explore patterns and converging trends in the data leading to possible themes. Common and convergent emerged. These included self concept, experience, readiness, orientation, and motivation (the principles of andragogy). A process of validation of themes was then undertaken. This was done via a number of credibility checks, which are, explained further below.

## **Quality of Data**

Social settings can provide uncertainty and data collected from such a setting is subject to interpretation and meaning that is dependent on many factors (Neuman, 1997:72). In order to overcome these factors a number of techniques were used to increase the credibility, transferability, dependability and confirmability of the data. Creswell (1998:201) presents eight procedures for assessing the quality of data. These include prolonged engagement and persistent observation; triangulation; peer debriefing; negative case analysis; clarifying researcher bias; member checks; rich, thick description; and external audits. Creswell (1998:203) recommends that at least two of these should be engaged during any given study. These procedures will be explained below with reference to how the researcher implemented each throughout her inquiry.

## **Credibility**

Erlandson, Harris, Skipper and Allen (1993:30) explain, “credibility needs to be established with the individuals and groups who have supplied data for the inquiry. It is assessed by determining whether the description developed through inquiry in a particular setting ‘rings true’ for those persons who are members of that setting.”

Because each individual represents a different constructed reality, a credible inquiry is one that effectively represents both the areas in which these realities converge and when the realities diverge. In order to check the credibility of the data and the inquiry the researcher conducted a number validity checks including prolonged engagement and persistent observation, triangulation, peer debriefing, negative case analysis and member checks.

### **Prolonged Engagement and Persistent Observation**

Lincoln and Guba (1985:301) define prolonged engagement as “the investment of sufficient time to ... learning the ‘culture,’ testing for misinformation ... and building trust”. The way in which the researcher demonstrated prolonged engagement was through regular periodic interaction with both cohorts of pre-service teachers throughout the whole semester. This periodic interaction enabled the researcher to follow the experiences of the pre-service teachers over a period of time (one university semester), thus providing some scope to the findings.

The purpose of persistent observation is to identify those characteristics ... most relevant to the problem or issue being pursued and focusing on them in detail. If prolonged engagement provides scope, persistent observation provides depth (Lincoln & Guba, 1985:304).

Persistent observation was demonstrated through the researcher’s recording of all face-to-face data collection procedures (observation and the two semi-structured interviews), thereby enabling a more in-depth look at the participants’ actions and responses as they applied to the inquiry.

### **Triangulation**

Triangulation is the process of exploring or looking at something from different viewpoints to gauge the accuracy of a particular position (Neuman, 1997:151). The literature suggests the use of triangulation to enable the researcher look for and explain

any discrepant or contradictory data and thus avoid the appearance of bias and to access multiple perspectives through a cross section of data methods and sources (for example, refer Ary, Jacobs & Razavieh, 2002; Mertens, 1998; Yin, 1994). The method of triangulation was therefore employed during the data analysis stage of this inquiry to check information that was collected from different sources and methods for consistency of evidence. Data from observations, artefacts and interviews were triangulated to check for consistency of evidence across data collection methods (as shown in figure 3.10). The next step was to check for consistency across sources. This was done by comparing and contrasting the participant data in order to create a case representative of each cohort (see figure 3.11).

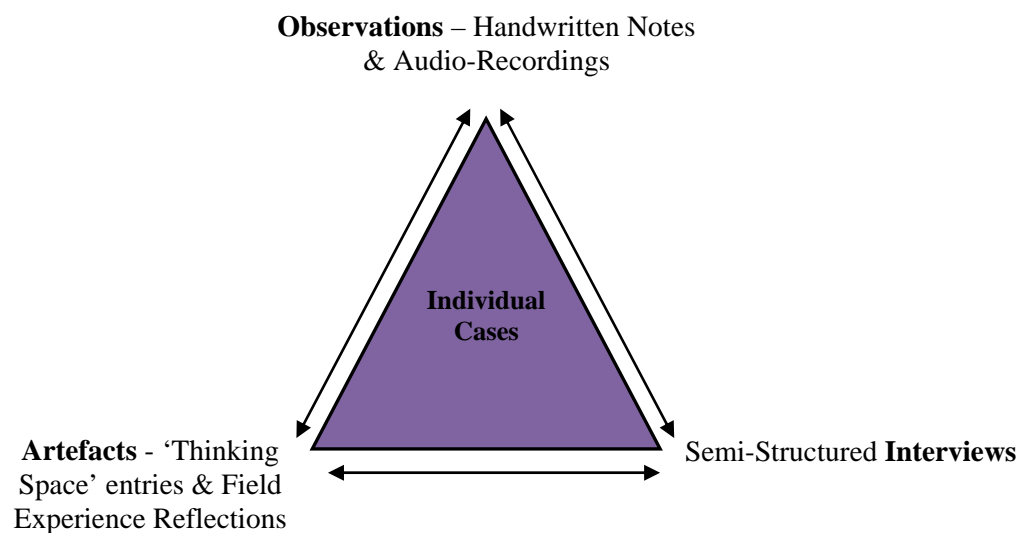


Figure 3.10: Triangulation of Data (methods)

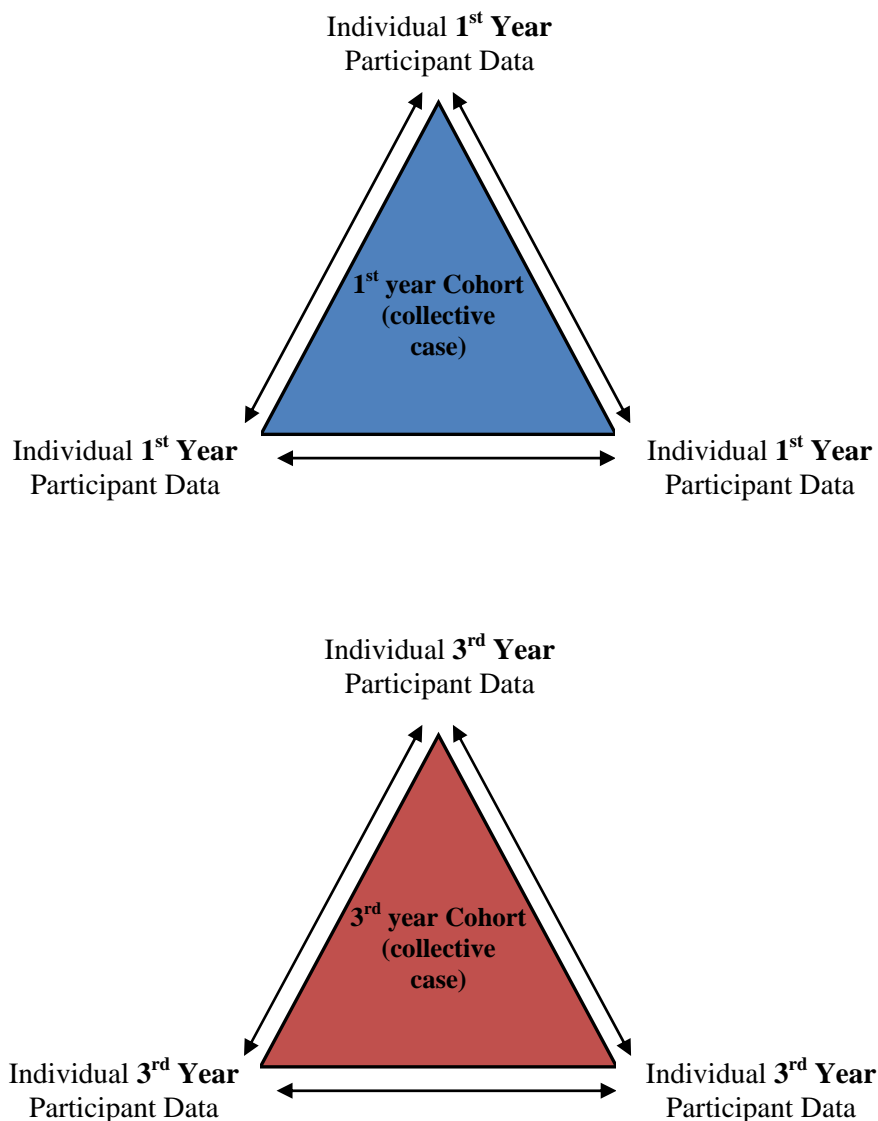


Figure 3.11: Triangulation of Data (sources)

### Peer Debriefing

Mertens (1998) recommends the use of peer debriefing when conducting qualitative research to explore possible bias in the interpretation of data. During this time the reviewers may identify problems in the interpretation and stress the need for additional data (Ary, Jacobs & Razavieh, 2002:452). Peer debriefing sessions were conducted after



each phase of the data collection process. This entailed regular meetings with supervisors to discuss both the raw data and the researcher's interpretations of the data.

Peer debriefing sessions were also held during the coding phase of data analysis. During this meeting the researcher and a colleague discussed the emerging themes of the data and jointly coded an interview. Both the researcher and her colleague then set about coding the same piece of data (another interview) independently. These codes and interpretations were then discussed and a consensus was formed regarding the way in which interpretations were made from the data collected. Further, a tightening of coding categories in connection with the theoretical frame resulted.

Other, less formal, peer debriefing sessions were conducted with colleagues and/or peers. These colleagues and peers were people unattached to the inquiry, but with backgrounds in technology in education. Both types of peer debriefing sessions assisted the researcher in making accurate, unbiased interpretations when analysing the data collected.

### **Negative Case Analysis**

Lincoln and Guba (1985:301) define negative case analysis as an “activity aimed at refining working hypotheses as more and more information becomes available”, thus increasing the credibility of the findings. Creswell (1998:202) further explains this process as the researcher refining a “working hypotheses as the inquiry advances ... in light of negative or disconfirming evidence. The researcher revises initial hypotheses until all cases fit, completing this process later in data analysis”. In regard to this inquiry, the researcher sought and discussed elements of the data that did not support and in fact appeared to contradict the explanations that were emerging from data analysis. An example of a negative case can be seen in the data pertaining to the third-year pre-service teachers. It appears that for some of the third-year pre-service teachers, engagement with ClassSim was not a valuable experience as they had the perception that they did not require additional practical examples of a classroom as their knowledge and skills were adequate enough to begin their teaching careers. Therefore,

the researcher remodelled her definition and understanding of the theoretical frame of andragogy to include the seemingly disconfirming evidence.

### **Member Checks**

Mertens (1998:182) explains that member checks are the most important criteria in establishing data credibility. In member checks the researcher “solicits feedback from the participants themselves about the study’s findings” (Ary, Jacobs & Razavieh, 2002:436) to reduce research bias and ensure the authenticity of participant responses. The researcher made contact via email with the participants after each interview. This usually occurred two to three weeks after the interview as the researcher needed to transcribe the interview and perform a preliminary analysis of the data. Once a preliminary analysis was complete the researcher emailed the participants a copy of their interview transcripts and researcher interpretations, in order to verify the accuracy of the interview’s portrayal of the participants’ positions. The participants were given time to examine these data and make comment on the validity of the findings. No concerns were raised over the accuracy and the data collected or findings surmised.

### **Researcher Bias**

Mertens (1998:182) suggests that the researcher “should monitor his or her own developing constructions and document the process of change from the beginning of the study until it ends”. This can be accomplished in a number of ways. It is contended that any researcher bias was identified and acknowledged in chapter one. To further this, peer debriefing sessions were held and member checks were completed to ensure any researcher bias did not affect the emerging findings.

### **Thick Description**

Lincoln and Guba (1985:125) suggest, “description must specify everything that a reader may need to know in order to understand the findings”. Thus ‘thick description’

is a way in which a researcher might shed light on their inquiry thereby enabling “observers of other contexts to make tentative judgements about applicability of certain observations for their context and to form ‘working hypotheses’ to guide empirical inquiry in those contexts” (Erlandson, Harris, Skipper & Allen, 1993:32-33). However it is important to note that the findings are not part of the thick description, although they must be interpreted in the terms of the factors thickly described. It is contended that appropriate context-rich ‘thick description’ about the two cases is presented in chapter five and chapter six.

### **Dependability and Confirmability**

“Consistency is conceived in terms of ‘dependability,’ a concept that embraces both the stability implied by ‘reliability’ and the trackability required by explainable chances (Guba, 1981:81). Therefore it is the characteristics of the data, which come into question, as opposed to the researcher’s characteristics. Guba and Lincoln (1989:243) explain that “the naturalistic researcher does not attempt to ensure that observations are free from contamination by the researcher but rather to trust in the ‘confirmability’ of the data themselves. ‘This means that data (constructions, assertions, facts and so on) can be tracked to their sources, and that the logic used to assemble the interpretations into structurally-coherent and corroborating wholes is both explicit and implicit’”. Therefore both dependability and confirmability are communicated through an audit.

### **Audit Trail**

Erlandson, Harris, Skipper and Allen (1993:148) explain audit trails lead to “dependability and confirmability by allowing an auditor to determine the trustworthiness of the study”. “The audit trail ... also enables an external reviewer to make judgements about the products of the study. An adequate trail should be left to enable the auditor to determine if the conclusions, interpretations, and recommendations can be traced to their sources and if they are supported by the inquiry” (Erlandson, Harris, Skipper & Allen, 1993:35). In regards to this inquiry the researcher kept a

thorough audit trail of the different methods of data collection, the different sources and when each piece of data were collected (see appendix R).

## **Ethical Issues**

The University's Human Research Ethics Committee granted ethical approval for this project on the 22<sup>nd</sup> June 2006 (HE06/137). Specific ethical considerations addressed in the application are discussed below.

### **Anonymity, Confidentiality, and Access to Information**

Persons other than the researcher did not have to access data material. As the data were collected, all identifying features (names etc.) were removed from the raw data. The researcher coded the names of the participants, which was kept confidential. All data were stored in a locked filing cabinet and all electronic data ('Thinking Space', field experience reflections, transcribed interviews and peer discussions) were kept on a Faculty of Education computer under password protection. In the publication of data all participants were given pseudonyms to ensure data cannot be linked to the participants.

### **Participant Recruitment and Informed Consent**

Potential participants were approached during mass lectures ('Professional Practice') and asked to fill out a demographic survey. The researcher informed both cohorts of pre-service teachers that their filling out of the survey was voluntary. The purpose of the demographic survey was to obtain general information on the cohort of students enrolled in these subjects and to ask if the students were interested in volunteering to participate in research. Those interested in the research were asked to provide contact information on the survey and were issued with an information sheet informing them about the overall project and the aims and objectives of the research. The project was discussed with these potential participants, and they were given the opportunity to ask questions and raise concerns. From those who agreed to participate, the researcher chose

a purposive sample of seventeen students (ten for their first year of study and seven from their third year of study). As part of their subject requirements all pre-service teachers were required to explore the ClassSim software. Therefore the volunteer participants had planned class time to engage with ClassSim. All student volunteers were advised that there may be a slight increase in workload if they agree to participate (which was clearly stated on consent and participant information forms – see appendices P & Q) and they were informed that their participation in the project or withdrawal from the project would not affect their performance in the subject or their relationship with the researcher, faculty, or university.

## **Summary**

This inquiry was employed under the umbrella of qualitative research. An interpretative paradigm supported the basic theoretical assumptions, the reviewed literature, and the researcher's research orientation.

The purpose of this inquiry was to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experiences. In particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identities. A comparative case analysis was adopted, as this design was most appropriate as it allowed for an in-depth comparison of the two cohorts of pre-service teachers.

# Chapter Four

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# **The Process of Preparing Data for Cross-Case Analysis: Employing Andragogy as the Theoretical Frame**

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## **Introduction**

The inquiry was guided by one broad research question, followed by three sub-questions. The overarching central question was:

How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?

The sub-questions, which further frame the inquiry, were:

- *What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?*
- *In what ways can the virtual environment of ClassSim support the principles of adult learning?*
- *In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?*

This chapter outlines how the collected data were transformed into two case studies (first and final-year pre-service teachers) and compared under the theoretical frame of andragogy. Data were collected through observations, artefacts, and semi-structured interviews after their use of ClassSim both before and after their field experiences. As the aim of the case study approach was to collect and present “extremely rich, detailed, and in-depth information” (Berg, 2001:225), these methods were appropriate. The findings of this inquiry were then organised under the assumptions of andragogy.

Andragogy has been defined as the “art and science of helping adults learn” (Knowles, 1980:54). It is “a way of thinking about working with adult learners” (Merriam & Brockett, 1997:135) where emphasis is placed on the guidance of adult learners to facilitate change in an adult person (Knowles, Holton & Swanson, 1998:60). For the past 40 years, andragogy has become a dominant adult education framework and has “exercised a significant influence on the practice of adult education” (Pratt, 1988:160). Further, it is claimed to be the “best-known theory of adult learning” (Merriam & Caffarella, 1991:249), and is considered “synonymous with the education of adults” (Pratt, 1988:160). It has been described as “the preeminent and persistent practice-based, instructional method” (Rachal, 2002:211), a “guiding principle on how best to educate adults” (Beder & Carrea, 1998:75), and, a “set of guidelines for effective instruction of adults” (Feuer & Gerber, 1988:35).

The purpose of this inquiry was to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experience. Andragogy provided a framework in which the learning of the pre-service teacher participants can be reviewed and propositions about how and why they learnt this new information while using ClassSim explored.

Andragogy is based on five principles of adult learning.

- Self-Concept: As a person matures, he or she moves from dependency to self-directness.
- Experience: Adults draw upon their experiences to aid their learning.
- Readiness: The learning readiness of adults is closely related to the development tasks of their social roles.
- Orientation: As a person learns new knowledge, he or she wants to apply it immediately in problem solving. Thus an adult is more problem-centered than centered in learning (Knowles, 1980:44-45).
- Motivation (Later added): As a person matures, he or she receives motivation to learn from internal factors (Knowles, 1984:9-12).



The five principles of adult learning are interrelated and work together to account for how and why an adult learner acquires new information. Figure 4.1 shows how these principles are interconnected and each contribute to the learning of an adult. All five principles influence each other, as depicted by the double-headed arrows, and all contribute to the learning of adults. An adult learner enters a learning experience with unique combinations of these principles and these influence what they learn from a particular experience.

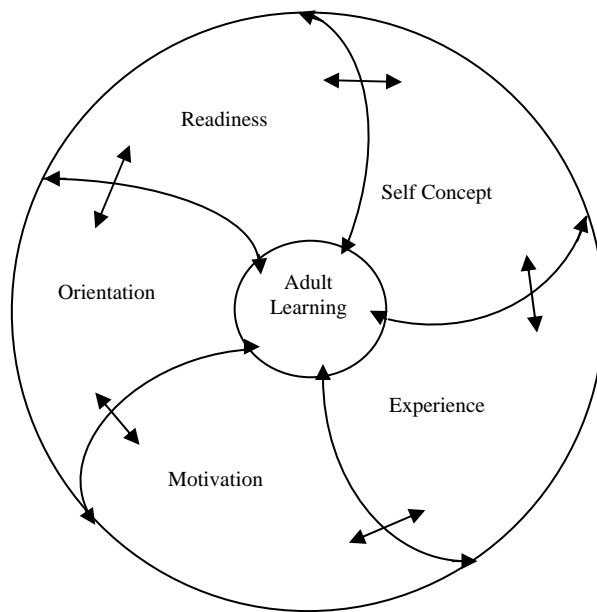


Figure 4.1: Assumptions of Andragogy

In relation to this inquiry, the five assumptions of andragogy work together to explain the learning of pre-service teachers and how this learning relates to their engagement with the virtual learning environment provided by ClassSim, their university coursework, field experiences, previous experiences, and other factors that may influence their learning (see Figure 4.2).

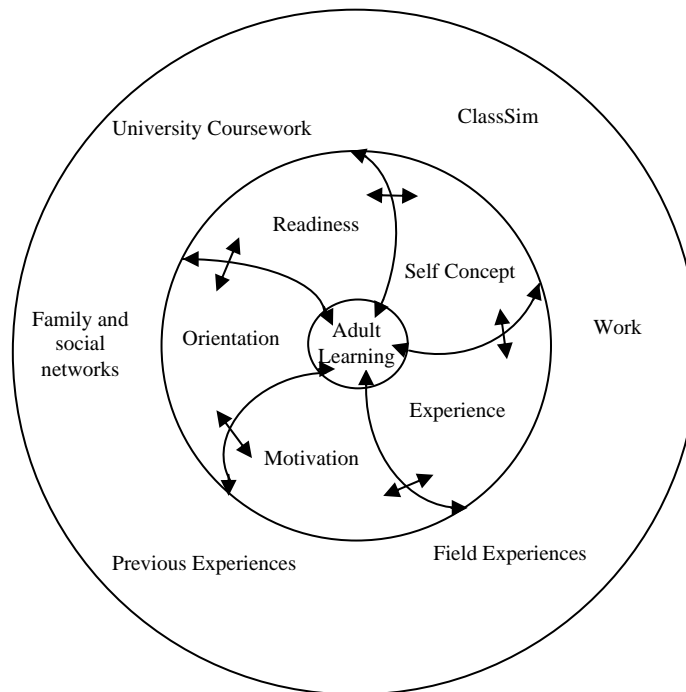


Figure 4.2: Pre-service Teacher Learning in Relation to Andragogy

These assumptions are described further below and discussed as to why each assumption is important in better understanding the learning of each case.

### Readiness

“Adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations” (Knowles, Holton & Swanson, 1998:67). A critical implication of this assumption is the importance of timing. Knowles, Holton and Swanson (1998) state that the timing of learning experiences needs to coincide with developmental tasks. Merriam and Caffarella (1999:330) state that an adult’s readiness to learn “is both inherent in and an outcome of the process” of learning. Thus, readiness to learn is seen as a developmental process that depends on the individual’s exposure to real-life situations that require them to act and learn. Rogers (1961:115) explains this phenomenon as “significant learning”, in which the individual is open to “new people, new situations, [and] new problems”. However, it is important to note that it is not necessary to sit idly by, waiting for readiness to develop on its own.

Knowles, Holton, and Swanson (1998:67) assert that there are a number of ways in which one can induce readiness through such things as “exposure to models of superior performance, career counselling, simulation exercises, and other techniques”.

‘Readiness’ was identified in the data from both cases in a number of ways. These include the first-year participants making statements about ClassSim preparing them for their first field experiences; the first-year pre-service teachers also explained that ClassSim helped them to understand their change in roles from student to teacher; both cohorts of participants made comment about making connections between the ClassSim content and their current university coursework; and the majority of the participants found the scenarios presented in ClassSim to be based upon real-world examples. Thus engagement with the virtual learning environment was seen as a valuable and worthwhile experience. Table 4.1 and 4.2 are examples of how ‘readiness’ was identified in the data and interpretations about the participants’ learning drawn (the coding system was - [R] = ‘Readiness’, [O] = ‘Orientation’, [M] = ‘Motivation’, and [SC] = ‘Self Concept’).

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> - When you used ClassSim the first time, what was your purpose?</p> <p><b>Daniel</b> - In terms of having the sim as <u>preparation for prac</u>, I think it was <u>very effective</u>. Being a first year student coming straight from high school and <u>not having very much experience with children</u> I thought it was <u>really useful</u>, providing just a <u>little insight before being thrown into the classroom</u>. It provided room to <u>experiment without having to worry</u> about negatively affecting children, as you were always <u>able to click ‘back’</u> (I_Daniel_23/07).</p>	<p>Preparation for field experience[R][O][M] Valuable experience [R][O][M]</p> <p>Anxious about entering a classroom in the role of a student teacher [R] Better understand the role of a teacher[R][O][M] Preparation for field experience[R][O][M] Non threatening experience [R][M]</p>

Table 4.1: Example of ‘Readiness’ in Data (purpose of engagement)

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> – What advantages did engaging with ClassSim offer you?</p> <p><b>Lauren</b> - I guess I knew how to plan and all that. But <u>it made me think, when I am in a classroom, ‘what am I going to do next?’</u> I felt like I <u>wasn’t even prepared</u> for the fill-in bits. I didn’t know what I should do to get from this <u>part of the day to this part</u>. Oh, and if this <u>kid finished early</u> and you haven’t got anything planned, what are you going to do with them? Really what am I going to do? I find from the learning side I’m very prepared for how should I assist the learners, cater for different learning needs all that kind of thing, <u>but that other fill-in stuff I feel unprepared</u> (I_Lauren_22/08).</p>	<p>Preparation for field experience[R][O][M]</p> <p>Unprepared for transitions [R][O][M][SC]</p> <p>Unprepared for extension activities [R][O][M][SC]</p> <p>Preparation for field experience[R][O][M]</p>

Table 4.2: Example of ‘Readiness’ in Data (timing of engagement)

## Orientation

The concept of ‘orientation’ assumes that adult learners are task or problem-orientated in their learning. According to andragogy, adult learning tends to be life-centred (or task/problem-centred) as opposed to how it is for their youth counterparts, for whom the majority of their learning in school is subject orientated. Thus, as an adult learns new knowledge, he or she wants to apply it immediately in problem solving. Jarvis (2004:251) explained, “the learner’s time perspective assumes an immediacy, so that learning is problem- and performance- rather than subject-centred”. As a result, adult learners learn best when new information is presented in real-life contexts.

‘Orientation’ was identified in the data of both cases. It was identified when the participants discussed the scenarios in ClassSim as real-life problems they expected to encounter in their future careers as teachers. Other specific examples include, when participants identified aspects of their learning that needed further development, acknowledging current deficiencies in their skills/knowledge base that they needed for their future career. Tables 4.3 and 4.2 show how ‘orientation’ was identified in the data and interpretations about the participants’ learning were drawn (the coding system was - [R] = ‘Readiness’, [O] = ‘Orientation’, [M] = ‘Motivation’, and [SC] = ‘Self concept’).

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> - When you used the ClassSim for the first time what was your purpose? What did you learn?</p> <p><b>Rachael</b> - Basically I just learnt some of the <u>jargon</u>, say the Literacy block I had <u>never heard of that before</u>. With the episode like the modelled reading and all the different types of <u>terminology</u> that you could use, I had never heard of that before. Also just <u>thinking about the little decisions that you had to make</u>, so like I had never really thought about, okay when I get to the classroom I have to think, how am I going to sit the kids? How am I going to introduce them to the classroom? What are going to be the rules in the classroom? Sort of like <u>behaviour management</u> kind of things (I_Rachael_25/07).</p>	<p>Terminology (Link to real-life context) [R][O][M] Preparation for field experience[R][O][M]</p> <p>Better understand the role of a teacher[R][O] Preparation for field experience[R][O][M] Real world problems – decisions (behaviour / classroom management) [R][O]</p>

Table 4.3: Example of ‘Orientation’ in Data (relevant scenarios)



‘Motivation’ was identified in the data from both cases. There were four areas that were the main indicators of ‘Motivation’. These included when the participants felt empowered to make decisions whilst engaging with the virtual learning environment; when the participants acknowledged a feeling of success in regard to a decision made within ClassSim; when the pre-service teachers made comment about the value of their experience with ClassSim; and when the participants remarked on their enjoyment working with the virtual learning environment. Each of these areas helped the researcher to identify how the participants were motivated to engage and continue engaging with ClassSim. Tables 4.5 and 4.6 give examples of how the aspect ‘Motivation’ was identified in the data (the coding system was - [R] = ‘Readiness’, [O] = ‘Orientation’, [M] = ‘Motivation’, and [SC] = ‘Self Concept’).

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> - How did you structure your virtual literacy block?</p> <p><b>Sarah</b> – <u>I didn’t really think about it</u>. No not really. I just sort of went <u>through the list</u>. I’d <u>quickly read some of the information</u> and I’d click on either decision to see what it had to say then <u>click ‘back’</u> and try the other one. It was like I wanted to <u>play the game</u> first, then learn it later (I_Sarah_27/03).</p>	<p>Non-threatening experience [R][M]</p> <p>Play the game (enjoyment) [M]</p>

Table 4.5: Example of ‘Motivation’ in Data (enjoyment)

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> – What are your concluding thoughts on your engagement with ClassSim?</p> <p><b>Marc</b> - Yeah I think it was a <u>valuable tool</u>; I get <u>frustrated because it locks me</u> in, so yeah, I guess that’s the big frustration because it <u>makes me make a choice that I might not have necessarily made</u>. It’s like, ‘give me <u>another option</u> I don’t like either of those’ (I_Marc_13/11).</p>	<p>Valuable [R][O][M] Design – not enough choices [M]</p> <p>Design – not enough choices [M]</p>

Table 4.6: Example of ‘Motivation’ in Data (volition)

## Experience

Argote, McEvily and Reagans (2003) point to experience as an important factor in one’s ability to create, retain and transfer knowledge. Knowles (1980) suggests that adults possess a reservoir of experiences that affect how they perceive the world. Thus, adult learners enter an educational setting with both a different quality and greater volume of life experiences than children. Knowles, Holton and Swanson (1998:66) explain “any group of adults will be more heterogeneous in terms of background, learning style, motivation, needs, interests and goals than is true of a group of youths”. Therefore, adult learners have an additional base of knowledge that can and should be used in the classroom or in a technology-based learning experience as adults want to use what they know and want to be recognised for having that knowledge.

However, it is important to note that, “while all learning begins with experience, this is not experience for which the learners already have a solution or response” (Jarvis, 1992:15). Knowles, Holton and Swanson (1998) also note that even though adult learners bring with them greater experience, these experiences can have potentially



negative effects. They explain that adult learners “tend to develop mental habits, biases, and presuppositions that tend to cause us to close our minds to new ideas, fresh perceptions, and alternative ways of thinking” (Knowles, Holton & Swanson, 1998:66). Therefore, an adult educator needs to accommodate these learning needs by taking steps to help adult learners examine their own habits, bias and assumptions.

‘Experience’ was identified in the data from both the first and final-year pre-service teachers. Examples of when ‘Experience’ was found in the data includes when the participants explained that their decisions were based upon their previous experience or knowledge and when the participant was able to reflect upon their experience in regard to their learning and their habits, bias, and assumptions. Both of these were the primary areas that indicated how ‘Experience’ influenced the adult learner. Tables 4.7 and 4.8 demonstrate how ‘Experience’ was identified in the data (the coding system was - [R] = ‘Readiness’, [O] = ‘Orientation’, [M] = ‘Motivation’, and [SC] = ‘Self Concept’).

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> – Can you identify any similarities between your actual field experience class and ClassSim?</p> <p><b>Leonie</b> - Yeah, the <u>interruptions</u> and stuff for sure. As far as the <u>classroom management</u> side goes, certain kids had issues like home issues, like they'd <u>bring their family issues to class</u>. One boy in particular, he had issues at home in regards to his family and his role in his family, due to a few different circumstances and you would see that effecting him in class. So you know what I mean, in terms of the ClassSim it's sort of gives you an <u>idea of what issues the kids might bring</u>. You see, initially when you sign up to go to uni and become a teacher you sort of <u>think every kid gets taught the same and then you realise it's not like that at all</u>, because how'd you teach him is not the same as another kid who has no big issues. That's what's happening to the kids in ClassSim they've all got their own issues, some are excelling, and some are having trouble with English. I didn't really have language as an issue in my classroom, but yeah I definitely saw how other issues can become distracting. Also things like, <u>whether to go out in the playground in the morning to talk to parents and children, or to stay in and plan ... at first I thought it would be helpful to stay in the classroom, but as I got to know the students more and met some of the parents I found myself getting to school earlier to prepare for class and then when the students started to arrive, going out and talking to them and their parents about uni and their child's progress</u> (I_Leonie_23/07).</p>	<p>Similar scenario – interruptions &amp; classroom management [O][M][E]</p> <p>Gain understanding of student needs (background) [R][O][M]</p> <p>Assessment/reassessment of assumption (students taught the same) [E]</p> <p>Similar scenario - morning routine – inside Vs outside [O][M][E]</p> <p>Assessment/reassessment of assumption (more important to plan and be organised – plan early and keep in contact with the children and their parents) [E]</p>

Table 4.7: Example of 'Experience' in Data (previous knowledge and experience)

Extract from Data	Preliminary Analysis
<b>Marie</b> - The teacher should <u>finish what she was doing inside</u> if she needed to clean up <u>dangerous objects</u> like scissors etc., as this could be potentially harmful if these things are left lying around when the students come inside. <u>But I think it's important see the children before the morning lessons</u> (TS_Marie_30/08).	Rationalise decision - safety of students [E]  Rationalise decision - should go outside [E] Teaching belief [SC]

Table 4.8: Example of 'Experience' in Data (reflecting on experience)

## Self Concept

Knowles, Holton and Swanson (1998:65) state, "adults have a self-concept of being responsible for their own decisions, for their own lives". It is believed that "adults want to be the origin of their own learning and will resist learning activities they believe are an attack on their competence" (Speck, 1996:36). Thus, an adult learner needs to have some control over the 'who, what, where, why, when, and how' of their learning. Knowles, Holton and Swanson (1998:65) suggest that adult learning situations should take steps to "create learning experiences in which adults are helped to make the transition from dependant to self-directed learners", thereby enhancing their professional identity.

The main indicator of 'Self Concept' in the data was how the pre-service teachers used ClassSim. The pre-service teachers' actions and/or accounts of their learning identified how the pre-service teachers utilised the structure (branching and skipping) and support features (such as the summaries) built into ClassSim to direct their own learning. In addition, the pre-service teachers' identification and articulation of their own professional identity was an indicator of their 'Self Concept' as a teacher. Tables 4.9 and 4.10 illustrate how 'Self Concept' was identified in the data and interpretations

drawn about the participants' learning (the coding system was - [R] = 'Readiness', [O] = 'Orientation', [M] = 'Motivation', and [SC] = 'Self concept').

Extract from Data	Preliminary Analysis
<p><b>Michael</b> - I didn't really know any of the <u>technical words</u> or things like that, like I knew a 'literacy block', really what's <u>involved</u> in it, <u>but not how they look</u>. I <u>didn't know that they are broken down</u>; originally I thought that lessons were just thrown together and not thought out into just tiny separate episodes. I sort of get it now; I kind of <u>see how it all connects to like what they are teaching us in class</u> (I_Michael_24/07).</p>	<p>Use of support features – summaries [SC]</p> <p>Build upon previous knowledge [E][SC]</p> <p>Links to university coursework [E]</p>
<p><b>1:58pm</b>  <b>Michael</b> - Decides upon 'same ability grouping' during 'cut and paste activity'. Reads '<u>same ability grouping</u>' summary.</p> <p><b>2:03pm</b>  <b>Michael</b> - Goes <u>back</u> and changes to 'table grouping'. Reads summary '<u>table grouping</u>'.</p> <p><b>2:06pm</b>  <b>Michael</b> - Enters 'Thinking Space' and writes about grouping of students (O_Michael_08/03).</p>	<p>Use of support features – summaries [SC]</p> <p>Use of support features – summaries [SC]</p> <p>Reflection on new knowledge [R][O][M][E][SC]</p>

Table 4.9: Example of 'Self Concept' in Data (structure and support of learning experience)

Extract from Data	Preliminary Analysis
<p><b>Interviewer</b> - Did you make use of the support material available throughout ClassSim?</p> <p><b>Mia</b> - I think <u>by this stage I wouldn't need definitions of those words. I knew exactly what they're meaning and they're just common language.</u> I think if I was doing first year, I would probably need the explanations, but now <u>it's expected that you know them.</u> Whereas when you're just starting out it's good to introduce people to the terms that they will use. So yeah, I knew exactly what was going on with that type of language that was being used <u>and I felt comfortable to understand what was being explained within the program</u> (I_Mia_21/08).</p>	<p>Understanding of professional terminology [SC]</p> <p>Expected knowledge by 3<sup>rd</sup> year - teaching language [SC]</p> <p>Understanding of professional terminology [SC]</p>

Table 4.10: Example of 'Self Concept' in Data (professional identity)

## Summary

Overall, the five principles of andragogy were used to assist the researcher to pose explanations about the learning of the pre-service teachers (both first and final-year), in particular, their engagement with the virtual learning environment provided by ClassSim, as well as their university coursework, field experiences, previous experiences, and other factors that may influence their learning about their role as a classroom teacher. This framework of andragogy provided scaffold that the researcher used to compare the two individual cases.

Chapters five and six discuss the findings of the first and third-year pre-service teacher cases respectively, according to the five principles of andragogy as discussed in this chapter.

# Chapter Five

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## **First-Year Pre-service Teacher Case**

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The findings from the first-year pre-service teachers are presented in this chapter. The first section provides the contextual background of the case. The second section discusses the findings that emerged. The third section summarises the first-year pre-service teachers as a case.

### **Context**

In the year of the inquiry, the first-year participants were full-time students enrolled in a three-year Bachelor of Teaching (Primary) degree. A total of sixty days of field experience teaching was required during their degree, and each year, a 'Professional Practice' subject supported this practice teaching. This subject was designed to assist students to develop their understanding of the processes and procedures associated with classroom teaching, and to help students take full advantage of their field experience. The subject outline for the first year subject claimed "it integrates the learning on campus with field based (on site) experiences in mentoring schools and information on line. Students' education, knowledge and beliefs are assessed to promote their professional development throughout the course" (DA\_26/02).

During their first-year subject, pre-service teachers were introduced to essential curriculum concepts, classroom management strategies and student welfare issues. The use of ClassSim was scheduled as a component of this first-year subject and took place during the second week of the thirteen-week semester. The school-based experiences component of this subject included observations of a range of demonstration lessons at local primary schools that were followed up with scheduled microteaching lessons with small groups of students from the class that they observed at the demonstration schools. Near the end of their first semester pre-service teachers completed ten days of practice teaching at an assigned school.



## The First-Year Participants

Ten first-year participants were purposively selected. The characteristics of age, educational history, average mark obtained in previous studies and prior experience with children were used to ensure the data obtained from the participants represented the widest possible range of these characteristics. The first-year pre-service teachers (seven female and three male) comprised the cohort of first-year participants for this study. They were selected to represent the first-year students enrolled in this degree. Table 5.1 provides an overview of these participants.

<b>Name (pseudonym)</b>	<b>Age</b>	<b>Educational history</b>	<b>Average mark obtained in previous studies</b>	<b>Prior experiences with children</b>
Kim	17 - 19	High school	50 - 64%	Siblings
Leonie	17 - 19	High school	85% +	Siblings
Rachael	17 - 19	Other - college	75 - 84%	Tutor (primary maths)
Sarah	20 - 22	High school	85% +	Helper in parent's classroom
Serena	23 - 25	TAFE	75 - 84%	Church group leader
Kellie	26 +	High school	50 - 64%	Own children & Helper in child's classroom
Jasmine	26 +	TAFE	85% +	Swimming teacher
Daniel	17 - 19	High school	65 - 74%	No experience
Michael	17 - 19	High school	75 - 84%	Karate instructor
Bruce	26 +	TAFE	65 - 74%	Sibling & Children of own

Table 5.1: Overview of First-Year Participants

Each participant is described in more detail below.

### **Kim**

Kim was an 18-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. Kim finished her final year of high school receiving an average of 50-64% in her studies (S\_Kim\_05/03). Prior to her entry into university she had little experience working with children. She has two older brothers (I\_Kim\_19/03).

### **Leonie**

Leonie was a 17-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. Leonie finished her Higher School Certificate (HSC) receiving an average mark of 85%+ (S\_Leonie\_05/03) and progressed straight into university. Prior to her entry into university Leonie had little experience working with children but had a younger sister, whom she often took care of (I\_Leonie\_20/03).

### **Rachael**

Rachael was a 19-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. After finishing Higher School Certificate (HSC), Rachael completed a Diploma of Beauty Therapy at a private college. Rachael received an average mark of 75-84% in this course (S\_Rachael\_05/03). After receiving her diploma Rachael decided to apply to study education at university. Prior to her entry into university Rachael had had some experience working with children. She had been tutoring two primary-aged children in mathematics for three years in a one-on-one situation. During an interview Rachael said that it was this tutoring experience that motivated her to change her career focus (I\_Rachael\_29/03).

### **Sarah**

Sarah was a 21-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. After finishing her Higher School Certificate (HSC) from which she

obtained an average mark of 85%+ (S\_Sarah\_05/03), she deferred her offer of enrolment to university and spent a year in the United Kingdom to work and travel. She worked in a London high school as a teacher's aide. During the morning period she worked with a number of special needs children (with Dyslexia, Asperger's Syndrome, and ADHD) in literacy and mathematics and coached various sports in the afternoon (I\_Sarah\_27/03). When she returned to Australia she spent some time working in her mother's year-two classroom as a helper, often taking small groups for reading and language activities (I\_Sarah\_27/03).

### **Serena**

Serena was a 23-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. Upon completion of her Higher School Certificate (HSC) Serena completed a Retail Traineeship Course at a Technical and Further Education College (TAFE). Serena's experience with children included being a Youth Group Leader for her church. She has been in this role since she was eighteen years old. As part of this role Serena worked with children from the age of seven to eighteen in activities such as reading, sporting activities, drama and other various group activities once a week (I\_Serena\_23/03).

### **Kellie**

Kellie was a 32-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. Kellie left high school after completing her School Certificate and had a family. Kellie reported that whilst she was at high school her average mark was 50-64%. To gain entry into the university Kellie completed a University Access Program (UAP). Prior to her entry into University she had experience working with children. Kellie was a mother of three children, two of whom were primary-school-aged children. Kellie regularly worked as a parent-helper at her daughter's school (I\_Kellie\_20/03).

### **Jasmine**

Jasmine was a 29-year-old female, enrolled in her first year of a Bachelor of Teaching (Primary) degree. Upon completion of her Higher School Certificate (HSC) Jasmine completed courses in Responsible Service of Alcohol (RSA) and Responsible Gambling Services (RGS) at TAFE and entered the work force in the hospitality industry. In the year prior to the study Jasmine completed an AUSTSWIM Teacher of Swimming and Water Safety qualification and began working as a swimming instructor at a local swim school, teaching children from the age of four to twelve (I\_Jasmine\_23/03).

### **Daniel**

Daniel was an 18-year-old male, enrolled in his first year of a Bachelor of Teaching (Primary) degree. Daniel finished his final year of high school, receiving an average mark of 65-74% (S\_Daniel\_05/03). Prior to his entry into university he reported no experience working with children and had no siblings (I\_Daniel\_20/03).

### **Michael**

Michael was a 19-year-old male, enrolled in his first year of a Bachelor of Teaching (Primary) degree. Michael finished his Higher School Certificate (HSC) receiving an average mark of 75-84% (S\_Michael\_05/03). Prior to his entry into university he had some experiences working with children. He completed his high school work experience in a local primary school and had been employed as a karate instructor for a little over two years teaching children in group situations from the ages of four to twelve (I\_Michael\_22/03).

### **Bruce**

Bruce was a 36-year-old male, enrolled in his first year of a Bachelor of Teaching (Primary) degree. After finishing his Higher School certificate (HSC) Bruce completed

a TAFE Financial Services Diploma. He then worked in a Bank as a Customer Service Officer and Lending Officer for fifteen years. Bruce had two children, one pre-school age and the other primary-school age (I\_Bruce\_22/03).

Overall, each participant had varied education and employment history, experience working with children, and academic achievement.

## **Findings of First-Year Pre-service Teachers**

The findings of this inquiry have been organised under the principles of andragogy (as described in chapter 4).

### **Readiness**

Readiness is a multifaceted concept that has a number of components. The components identified from the data were purpose of engagement, value to learning, changing role from student to teacher, and timing of engagement. These components are now discussed in more detail.

### **Purpose of Engagement**

Speck (1996:36) believes that “adults will commit to learning when the goals and objectives are considered realistic and important to them.” Therefore, the first-year pre-service teachers needed to feel that engaging with ClassSim fulfilled a worthwhile purpose. The findings indicate that the majority of first-year pre-service teachers found the virtual learning environment provided by ClassSim helped to prepare them for their first field experience. Six of the ten first year pre-service teacher participants made comments of this nature.

During an interview Daniel claimed that he used his experience with ClassSim as a preparation tool for his first field experience. Having no experience working with

children, Daniel was anxious about entering a classroom in the role of a student teacher and as such found his engagement with the virtual learning environment to be a valuable, non-threatening experience.

In terms of having the sim as preparation for prac, I think it was very effective. Being a first-year student coming straight from high school and not having very much experience with children I thought it was really useful, providing just a little insight before being thrown into the classroom. It provided room to experiment without having to worry about negatively affecting children, as you were always able to click 'back' (I\_Daniel\_23/07).

Michael also stated that he found his engagement with the virtual learning environment to be a valuable and worthwhile experience.

I think it has been really helpful, definitely, before we go out into schools. Particularly with people like me who hadn't been dealing with the kids as much as other people might have in classrooms (I\_Michael\_24/07).

Although Michael initially stated that he had experience working with children (as a karate instructor), he indicated that this experience was insufficient in preparing him for the role of a teacher in a classroom. Therefore, the interviews suggest that, while both Daniel and Michael felt underprepared to deal with the individual needs and behaviours of the classroom students while on field experience, through their engagement with ClassSim they gained a better understanding of the practicalities of a classroom. As a result, they claimed to have felt better prepared for their first field experience.

Rachael also made comments on how the virtual learning environment supported her preparation for her first field experience and the probable decisions she would need to make in the classroom. For Rachael, ClassSim was a valuable tool as it helped prepare her for an important learning experience (field experience) and the role she undertook whilst on her field experience.

It helps you prepare for it [field experience]. It [ClassSim] just gives you a little bit of insight before you go into a school, because if I'd gone to the prac before I'd worked on the ClassSim I would have been a little bit more unsure about what to do. I definitely wouldn't of thought I'd be making any class decisions. Even if a child needed to go to the toilet, whether you let them go or not, I would

have been a lot more hesitant. I would of relied a lot more on my supervising teacher (I\_Rachael\_25/07).

It appears that the experience with ClassSim exposed Rachel to a number of situations that were similar to what she observed during field experience. The virtual learning environment gave her opportunities to experiment with decision making, enhancing her confidence in making similar decisions in a 'real' classroom without the need to rely heavily upon her supervising teacher for guidance. Thus engagement with ClassSim prepared Rachael for the practicalities of classroom teaching, and it may have further developed her understanding of other aspects of her future role as a teacher.

Confidence was a common theme that arose in the findings from the first-year pre-service teachers. Many participants stated that through their engagement with the scenarios in ClassSim they became more confident to enter their field experience classroom and assume the role of a teacher. Leonie explained that she was nervous about her imminent field experience and used her engagement with ClassSim to immerse herself in the role of a teacher and therefore gain some confidence in her skills and knowledge needed for her field experience.

Apart from helping you out it was it was just purely anything to get more confidence going into the classroom. Because I don't want to be thrown straight into a class and be expected to do lessons. So I guess it was quite useful for me, just understanding how the classroom runs and feeling like I know what I'm doing when I'm out there (I\_Leonie\_23/07).

During her second interview, Kim also indicated that confidence was a major outcome of engaging with ClassSim.

Confidence was a big thing. Confidence with classroom management particularly. Just knowing that you've got a bit more of an idea about how things are going to run ... When I was on prac, it was intimidating but I kind of had more confidence cause I was like okay, I know if someone knocks on the door I know what to do and I sort of had a better idea how I should react to someone mucking around (I\_Kim\_25/07).

Overall, the findings indicate that both Leonie and Kim developed a stronger sense of confidence through their engagement with the virtual learning environment. Therefore,

it can be assumed that Leonie and Kim found their engagement with ClassSim to be a worthwhile and valuable experience as it helped them to feel better prepared for the decisions they may face during their first field experience.

Another reoccurring theme from the data was the first-year pre-service teachers' concerns about behaviour management. When asked about the perceived advantages from engaging with ClassSim, many of the participants made comments about their ability to trial behaviour management techniques in virtual situations. The virtual behaviour management experience appeared to give users the time to think through the consequences of strategies and to consider alternatives. As a result they expressed confidence in implementing these strategies during their field experience. Michael explained that the scenarios presented within ClassSim enabled him to think about the consequences of making a behaviour management decision.

On prac, I was thinking, how to control the class with the rewards and punishments like on the sim. How the class would react to it. How they can be used, like what ones you should use or could use, and what ones were helpful (I\_Michael\_24/07).

This suggests that Michael used his engagement with ClassSim to gain a better understanding of a range of different behaviour management strategies and the possible outcomes of these strategies. Furthermore it can be interpreted that Michael's engagement with ClassSim better prepared him for the behaviour management issues he faced while on field experience.

Another pre-service teacher suggested his engagement with ClassSim helped him to better understand the varying ways in which children may respond to behaviour management decisions. "ClassSim has opened my eyes up to different classroom scenarios. It shows you the way different things affect different students" (I\_Daniel\_14/06). It appears that Daniel's engagement with ClassSim gave him insight into the differing needs of individual students, and that each decision made will affect each student in a different way. Overall, the findings suggest that Daniel's engagement with ClassSim aided in his preparation for dealing with individual student needs during field experience.



Leonie stated that the most effective feature of the virtual learning environment for her was being presented with behavioural management problems and working out what to do in certain situations.

There was a lot of bullying in my prac classroom between the girls so the bullying aspect of the sim gave me ideas on how to deal with situations like bullying (I\_Leonie\_23/07).

Leonie was able to use her knowledge gained from her engagement with the virtual learning environment about bullying to better understand and deal with similar issues during her field experience, and thus was more prepared for her field experience.

Before entering university and beginning her teaching degree, Kellie had three children and volunteered as a helper at her daughter's school. As a result she believed she had a great deal of experience working with children. However, after engaging with the virtual learning environment Kellie stated that she was unaware that the role of a teacher was so multifaceted, that a teacher is not only concerned with the education of their students but also their wellbeing.

I gained knowledge of how little I knew and it just made me aware of the facets of teaching so not just education but what you've got in the back of your mind when you come in, like the well being of the students whether they're ok that day, their background. So more than anything, it was just sort of a real shock at the time about how holistic you're teaching has to be rather than just education based (I\_Kellie\_23/07).

The interview transcript indicates that through her interaction with ClassSim Kellie gained insight into the range of issues a teacher may face in regards to the personal needs of the students, as opposed to their formal educational needs. Therefore, it appears that the virtual learning experience augmented Kellie's 'readiness' to learn more about the role of a teacher, enhancing her preparation for her first field experience and future career.

Overall, it appears that the majority of first year pre-service teachers found the virtual learning environment to be an important tool in preparing them for their first field experience.

### **Value to Learning**

The design of ClassSim makes use of virtual learning experiences to create learning opportunities that are relevant and are considered valuable to the future learning of the user. To help achieve this goal, the content of ClassSim is closely linked to the first year compulsory subject 'Professional Practice' and subject-related readings.

During an interview, Daniel explained that the most challenging task he faced whilst engaging with ClassSim was creating a two-hour 'literacy block' and ensuring that the structure had 'flow'. When asked during his second interview, whether or not he felt confident in designing a two-hour literacy block for a kindergarten class after using ClassSim he replied:

I wouldn't know how to do it at the moment but with the ClassSim and the tutorials and the lectures that we're doing at the moment I will develop the skills to do so (I\_Daniel\_20/03).

This suggests that Daniel was able to see the relevance in learning the knowledge and skills presented in ClassSim, as he was able to link it to his current university coursework.

Michael was another first-year pre-service teacher who was able to link the knowledge and skills presented in the virtual learning environment with his current university coursework. Michael made this link through his use of the support material offered in ClassSim. After his first semester of his teacher education degree Michael re-entered the ClassSim (prior to his second interview) and had another look at the support material available, and as a result was able to make connections to his learning throughout the semester.

The first time I used it [ClassSim] I didn't go looking through the books suggested or anything. I just read the stuff on there. But now I have them and I look back on them I remember reading that and now I see how this makes sense with what I have learned. So I kind of see how it all connects to like what they are teaching us into what this is, in the information provided (I\_Michael\_24/07).

Therefore, on re-use of the ClassSim (after a semester of pre-service teacher education), it appears that Michael made stronger connections between his university coursework and the information provided in the virtual learning environment, and thus gained an increased appreciation of the relevance of the information presented in ClassSim.

Two pre-service teacher participants could articulate connections between the ClassSim content and their university coursework. However, eight of the first-year participants were unable to articulate connections made. ClassSim may have been presented too early in their first semester of study for them to be able to make connections.

### **Changing Role from Student to Teacher**

The first-year pre-service teachers were in the initial stages of progressing from the role of student to teacher. This is an important aspect of 'readiness' for the first-year participants as it enables the pre-service teacher to begin to develop a professional identity as a teacher rather than a student. Four of the ten pre-service teacher participants explained that through their engagement with ClassSim, they were able to experience the role of a teacher for the first time, and thus better understand their future role.

Daniel commented on his transition from a high school student to his role as a pre-service teacher. Although he had completed a week of practical experience in a primary school while he was at high school, he found his field experience as a pre-service teacher quite different as he now had a mindset that he was a beginning teacher and no longer a student. He also explained that it was his engagement with ClassSim that helped him to realise this change in roles and view the classroom from the point-of-view of a teacher.

I thought it [ClassSim] was really good to have before my first prac. When I first came to uni we kind of did all the theory, we didn't know anything really about a classroom. I'd been in a high school for so many years and yeah I did go do my year ten prac in a primary school but you look at it differently when you're actually starting to become a teacher. So looking at the ClassSim you're able to be reminded about all the different decisions you need to think about (I\_Daniel\_23/07).

This suggests that his engagement with ClassSim enabled him to explore the role of a teacher and gain a better understanding about his future role. Overall, it appears that ClassSim was a contributing factor in the facilitation of Daniel's 'readiness' to move from the role of a student to that of a teacher.

Kim also drew upon her experience as a high school student when she engaged with ClassSim and participated in her field experience. However, Kim decided against using her knowledge of behaviour management strategies that she remembered from high school as she realised they were inappropriate in a primary school setting. Kim suggested that through her engagement with the virtual learning environment she gained a better understanding of how a primary school teacher may react to behaviour management issues that may arise, as opposed to how a high school teacher might manage a similar situation.

It [ClassSim] gave me bit more of an idea about how things are going to run in a classroom ... I sort of had a better idea how I should react to someone mucking around rather than just having a go at them, like I can remember in high school. Primary school is a bit different and I sort of had a better idea on how to react to things (I\_Kim\_25/07).

Therefore it appears that ClassSim aided in the development of Kim's 'readiness' to move beyond her role as a high school student to that of a pre-service primary school teacher as it exposed her to relevant situations a primary teacher may face in a classroom.

ClassSim was used as a means by which beginning pre-service teachers were able to view a classroom through the eyes of a teacher, for the first time. Rachael explained that her experience was valuable as she was able to gain a better understanding of the types

of decisions a teacher must make. Rachael also made comment on how her engagement with ClassSim enabled her to assume the role of a teacher for the first time.

I thought it [ClassSim] was really good because I'd never been in like a classroom situation when I'd been a teacher so it's just like being in a different angle, just making decisions, I just didn't realise how many decisions a teacher would have to make and then prac just reinforced that (I\_Rachael\_29/03).

It appears that through her engagement with the virtual learning environment (in particular the decision-making opportunities) and her field experience Rachael's state of 'readiness' began to move from that of a student to that of a teacher.

Serena also utilised her experience with ClassSim to better understand the role of a teacher. When asked what she believed was the most beneficial aspect of engaging with the virtual learning environment, she explained that it helped her to gain an understanding of the classroom environment and the role of a teacher. She also indicated that before her engagement with ClassSim the only classroom experience she could draw upon was when she was a student.

Just to see what the classroom would be like and what affect the teacher can have. It really gave me an idea on the sort of decisions that would be faced in a classroom situation because the first year, the first semester of uni you have absolutely no idea really. You only had what you experienced as a student but as a teacher it's completely different, you've got to have some perspective (I\_Serena\_25/07).

Thus Serena utilised her experience with ClassSim to engage in virtual classroom scenarios. By making decisions about these scenarios and seeing the consequences of these decisions she appears to have a better understanding of the role of a teacher. Therefore it appears that Serena's engagement with ClassSim facilitated her 'readiness' to move from the role of a student to that of a teacher.

Overall, the findings suggest that many of the first-year pre-service teachers utilised their engagement with ClassSim to begin their progression from the classroom role of student to that of a teacher and, during this process they developed a better understanding of their future role as a teacher.

## **Timing of Engagement**

A factor that can enhance ‘readiness’ is the timing of an experience. Three of the first-year pre-service teacher participants found that the timing of their engagement with ClassSim was relevant to their current learning needs.

During his second interview, Michael explained that he felt underprepared for his first field experience as it was too close to the beginning of his first semester and he was expected to perform tasks whilst on field experience that he was yet to learn. When asked if ClassSim helped him prepare for his field experience he said:

In a way yeah, because I was teaching a lot of stuff I haven’t learnt, or learnt how to teach. I didn’t do any KLA’s this semester; I didn’t really have in depth knowledge on any subjects or how I should teach or that sort of thing. So in a way it sort of showed me the stuff I needed to know at the time, like what I might have to deal with - like the kids and what to teach, and that there are heaps of decisions to make, with different consequences. But it also had stuff in there that was too advanced for me at the time (I\_Michael\_24/07).

In Michael’s case, his engagement with ClassSim coincided with his developmental needs as a first-year pre-service teacher.

The design of the virtual learning environment (ClassSim) has the potential to induce first-year pre-service teachers’ ‘readiness’ by providing experiences that simulate situations so that the pre-service teacher will encounter a need for the knowledge or skill presented. During an interview, Leonie identified a number of behaviour management concerns she had as a beginning pre-service teacher. After being presented with behaviour management issues such as bullying during her engagement with ClassSim she felt better equipped to deal with similar situations in the ‘real world’.

ClassSim opened my eyes to things such as behavioural management and what to do in certain situations, such as students asking to go to the toilet. There was a lot of bullying in my Dem school classroom between the girls, so the bullying aspect of the sim gave me ideas on how to deal with situations like bullying (I\_Leonie\_20/03).

Engagement with ClassSim provided Leonie with experiences similar to those found in a 'real' classroom (in particular behaviour management issues) and thus catered to her stage of learning and facilitated her 'readiness' to transfer her ClassSim experience to comparable situations in the real world.

During his initial engagement with ClassSim Daniel identified that he misunderstood the importance of a number of seemingly trivial decisions. The second decision every user comes across (before branching occurs) is whether you would prefer to stay inside before class to get organised or go outside into the playground to greet the students and/or parents. It wasn't until Daniel was on his field experience did he understand the importance of such a decision.

There was also one occasion where I referred back to the sim ... The first couple of days on prac I had spent the mornings before school in the classroom madly planning and organising for the day ahead. I remembered from doing the sim that there was a section where you had to decide whether you wanted to spend the morning before school planning or outside talking to parents or students. After re-reading this part I decided to spend some time outside, introducing myself to parents and talking to the students. The sim seemed to pretty obviously encourage this and I also believe that it's a beneficial exercise (I\_Daniel\_23/07).

Daniel's re-engagement with ClassSim provided him the experience needed to understand the reasoning behind the decisions he was making on field experience. Further, it appeared that during his initial engagement with ClassSim, Daniel's state of 'readiness' did not allow him to recognise the importance of the decisions he was making. However, his state of 'readiness' developed further after encountering a similar scenario during field experience.

During the same interview with Daniel, he discussed how his engagement with ClassSim enabled him to take on the role of a teacher and interact with the virtual children. From this viewpoint he was able to experience their individual reactions to the decisions he was making and better understand the decision-making processes of a teacher. Furthermore, Daniel explained that this type of experience could not be provided by his university coursework.

I learned a lot about actually dealing with the kids, cause at uni you're mostly learning, okay, this is what a class is, this is how you structure it, but you don't actually learn about kids 'cause they [the university teachers] can't just bring in kids and show us how they react. So it was good to see how the different kids react with their different personalities and the different results in the updates with how they react to different decisions that you make, and every decision that you make ... Also I didn't actually know what to expect cause I hadn't really dealt with that much like kids in like a classroom situation. Just to think about it, they're constantly asking you things like 'can I go to the toilet', and you've got to be prepared for things that you didn't really consider before, which is hard because you're busy thinking about the actual lessons that you're going to have to teach (I\_Daniel\_23/07).

This suggests that Daniel's engagement with ClassSim coincided with both his stage of learning and induced his 'readiness' to learn about interacting with children. While Daniel's university coursework provided him a lot of background understanding regarding his future role as a teacher, it provided less opportunity to apply his coursework to classroom practice. ClassSim was thus seen as providing a virtual experience that allowed Daniel to connect some of his coursework to practical scenarios.

The first-year pre-service teachers recognised that they needed to learn about such issues that were not explicitly taught during their coursework. The findings indicate that engagement with ClassSim allowed the first-year pre-service teachers to interact with virtual children within a virtual classroom, thereby fulfilling a specific need that they recognised. Thus ClassSim provided scenarios that the pre-service teachers saw as relevant to their professional learning and imminent field experience. Overall, the majority of first-year pre-service teachers found ClassSim's content to be closely related to that of their university coursework, and through their engagement with the software they were able to take on the role of a teacher in a classroom (as opposed to the role of a student) within a virtual classroom. Further, their engagement often coincided with their stage of learning and this appears to induce learning in areas that related to field experience. Thus engagement with ClassSim appears to support the first-year pre-service teachers' 'readiness' to undertake their first field experience.



## **Orientation**

The principle of ‘Orientation’ argues that an adult learner is task or problem-orientated in their learning. The two aspects of ‘Orientation’ that relate to this inquiry are relevant scenarios and the need for new knowledge.

### **Relevant Scenarios**

Virtual learning environments such as ClassSim are more effective when they utilise real-life examples or situations that adult learners may encounter in their life or on the job. Therefore, in regard to this inquiry, it appears that the first-year pre-service teachers were able to make connections between what they were learning and how it applies to their future career as a teacher (as a task they need to perform or as a problem that needs to be solved). The findings indicate that five of the ten first-year pre-service teachers found ClassSim to be a worthwhile learning experience as it presented relevant, real-life examples.

During an interview after the Bruce’s first field experience he was asked if there were any similarities between what he had experienced in a ‘real’ classroom to what he had experienced in ClassSim. Bruce suggested that the notion of time management was a common theme; that the number of interruptions experienced in both classrooms disrupted the amount of effective teaching time.

The disruptions to the class was right on the money cause my classroom was just chaos. It wasn’t the same age they were year five, but they were just calling out ... kids walking around the classroom, kids coming in from other classes, parents and all that stuff coming in, so a lot of interruptions. It [ClassSim] helped you see how much time is lost, you know, you sort of can relate it to the same situation, where you know Bibi’s crying getting a bit emotional and then that cost time and then someone comes in and that cost time. It’s all about minimizing its impact. It happens more than you think in real life doesn’t it (I\_Bruce\_26/07).

Bruce’s engagement with ClassSim and experience during field experience helped him to better understand the idea of time management in a classroom. Therefore, through his

engagement with ClassSim, Bruce was able to experience situations often encountered as a teacher, thus supporting his ‘orientation’ to real-life problem-solving.

During an interview Serena commented that ClassSim provided her with situations similar to what she experienced while on field experience. She found the task of structuring a lesson in ClassSim most relevant, as she was required to perform the same task in a real-life context.

Well I did notice that when I did do the ClassSim I found out you really need to model everything first, cause otherwise the kids are not going to be able to go to the next stage, it’s almost like building on layers like nuts. If you don’t have the basic foundations you are not going to get anywhere. So that was a really big thing for me to know. Whenever I was planning for my lesson’s on prac I had to make sure we were going over everything first. I remember looking at the student updates and if you hadn’t gone over stuff they were confused so I made sure I recapped all the things that we had read. After that I’d guide what we were going to do next, and get them to how to go about it themselves. Now that really helped with the ClassSim demonstrating that and getting me to think about that (I\_Serena\_25/07).

Thus it appears that the virtual learning environment provided Serena with a tool to interpret and reinforce what she observed and experienced during her field experience about lesson structure and planning. Further, being presented with an authentic task in ClassSim acted to orientate Serena’s learning, making the learning experience more effective.

Rachael made comment on how ClassSim introduced her to the importance of decision-making and transitions between lessons. Rachael explained that the situations presented in ClassSim were similar to those she expects to face as a teacher.

Just thinking about the decisions that you had to make. I had never really thought about okay when I get to the classroom I have to think how am I going to sit the kids, how am I going to introduce them to the classroom, what are going to be the rules in the classroom, sort of like behaviour management kind of things. I think that they were the first things that I thought about when using the sim and they seem to be things I need to know about (I\_Rachael\_25/07).

It seems that Rachael not only found her engagement with ClassSim to correspond with her current 'orientation' to learning, as it was problem orientated; it also increased her understanding of the role of a teacher.

Kellie also found the decision-making opportunities presented in ClassSim to be similar to what she experienced during her field experience. Kellie explained that the ClassSim was a good representation of how a teacher's decision can have unforeseen consequences. "Kind of like the chain of events would occur depending on your decision. Influencing the outcome and things like that. I think ClassSim captured that well" (I\_Kellie\_23/07). Thus, the findings indicate that Kellie gained a better understanding of the impact of her decisions via her engagement with ClassSim and field experience. Therefore it appears ClassSim presented Kellie with real-life problems and corresponded to her 'orientation' to learning.

Jasmine explained that she drew upon her engagement with ClassSim when on field experience. When on field experience one of her students hesitated when answering a question. Jasmine recalled a similar situation in ClassSim.

I was thinking if they couldn't answer it should I move on. Then I remembered that was one of the questions in the sim where someone couldn't answer it or something. I think it was Gavin. Yeah it was Gavin, do you stay with him or do you move on to another child. Every time someone went 'oh' or 'um', I always think of it. Should I stay with them, or should I go on? I was remembering what happened there, and if I give them a couple of minutes and say 'you think about it for a little while I ask one more person' then I go back to them. It's what I usually do. I always think of it (I\_Jasmine\_24/07).

Jasmine appears to have gained insight about questioning techniques through her engagement with ClassSim. Thus Jasmine found ClassSim to be a beneficial learning experience and corresponded with her 'orientation' to learning, as it was based upon real-life problems she identified that she will face in her future career.

Overall, the findings indicate that many of the first year pre-service teachers found the scenarios presented in ClassSim to be relevant to the scenarios they will be presented with during their future career as a teacher.

## **Need for New Knowledge**

The other aspect of 'Orientation' is the adult learners' identification of limitations they have in their current knowledge and/or skill base. As the first year pre-service teachers used ClassSim, it was probable that they would gain a better understanding of their future role as a teacher and would identify limitations of their current knowledge and/or skills. The findings indicated that five of the ten pre-service teachers were able to identify deficiencies in their current knowledge and/or skills that required further development.

Kellie was able to identify a number of deficiencies in her knowledge as a pre-service teacher. She explained that through her engagement with ClassSim she became aware of how little she knew about the role of a teacher. Therefore through the problem-based scenarios presented in ClassSim, Kellie was able to develop a better understanding of the multi-faceted nature of the teaching profession.

I gained knowledge of how little I knew and it just made me aware of the facets of teaching so not just education but what you've got in the back of your mind when you come in, like the well being of the students whether they're ok that day, their background. So more than anything, it was just sort of a real shock at the time about how holistic you're teaching has to be rather than just education based (I\_Kellie\_23/07).

Kellie's engagement with the virtual learning environment gave her insight into the role of a teacher in regards to the individual needs of the children. Thus, it appears that ClassSim offered an environment in which Kellie was able to engage with real-life tasks and problems and ultimately identify areas where she required further learning.

During his engagement with ClassSim, Bruce decided to venture outside to greet his virtual children and parents in the scenario. Although he found this to be somewhat advantageous in gauging the students' moods and behaviours, he explained that his limited understanding of the children made it difficult to decide the best course of action for each child, let alone the whole class.

Even before the school day starts it becomes apparent that there are an increasing number of things on a teacher's mind which extend beyond the classroom. It was a good decision to leave the room 5 minutes before the bell as this gave the teacher a chance to gauge the students' mood and behaviours before being faced with class. It already feels difficult to consider what is best for a particular student vs. the group (TS\_Bruce\_10/03).

Bruce found his decision to go outside before class and greet the children beneficial, as he was able to gain insight into the students' mood and behaviour. However his lack of knowledge and experience made it difficult for him to see how he could make use of this information. Bruce's comments may indicate that his understanding of the competing needs of the individual versus the group required more development.

Bruce was also able to identify another area in which he required more knowledge and skill. In his 'Thinking Space' Bruce reflected upon his lack of practical experience to make decisions such as using workbooks or worksheets during a handwriting lesson. Therefore through engagement with ClassSim Bruce was able to identify another area in which he required further knowledge.

The decision of working books vs. work sheets seems a simple and somewhat insignificant choice. The use of a work book may create more disruption when they must be handed out or gotten out of school bags. Stencils can be more focused and make it clear for children what the activity is. Without having practical experience I find it hard to understand about the pro's and con's of each option as to help assist with what to choose (TS\_Bruce\_10/03).

This indicates that Bruce felt underprepared to deal with classroom management decisions such as the distribution of classroom resources. Classroom management is an area identified which the majority of first year pre-service teachers often feel they need to know more about. Overall, Bruce utilised the scenarios presented within ClassSim to gain a better understanding of his current knowledge and/or skill base and identify areas, which require further learning.

During her engagement with ClassSim, Kim was able to identify a gap in her knowledge base. She suggested that her understanding of the practicalities of a classroom was insufficient as the knowledge she required to make decisions could not

be acquired from the university coursework she was currently engaged in; rather, it comes from experience.

In the essence of effectively using resources sharpening the pencils would seem an appropriate option however this can be noisy and time consuming. Instead the children should be given new pencils, with the old pencils kept and sharpened at recess or the end of the day and then returned to the pencil tubs. The use of new pencils has encouraged other children to want new pencils and in turn consumed all of the remaining pencils. The pencils should have been sharpened instead. Again I felt insufficiently prepared to make this sort of decision as it is primarily based on the practicalities of a classroom and this information cannot be found in readings or lectures. It comes purely from experience (TS\_Kim\_28/04).

Thus it appears that Kim's engagement with ClassSim provided the experience she needed to help her identify areas in need of further development. Further she also indicated that similar issues that deal with the practicalities of a classroom are better learnt within a practical context.

During his interview Daniel described that while he was on his ten-day field experience he felt underprepared to effectively address the many behaviour management issues faced by a teacher. He explained that his limited knowledge, skills, and experience as a first-year pre-service teacher hindered his ability to implement effective behaviour management strategies.

In contrast to ClassSim, I had the better behaved students but even still I forgot how much engagement I had to give the students. So I'd turn around and think it was all going well and turn back and five people were on the one side were talking. There were a number of times I had to stop. I didn't have enough strategies of my own to implement so I'd sort of turn around and I'd be 'alright everyone do this' but I probably didn't execute it as effectively as I could have (I\_Daniel\_23/07).

Daniel's field experience and use of ClassSim highlighted his need to discover new behaviour management strategies. Thus, it appears that through his engagement with ClassSim and his field experience, Daniel was able to identify areas for further study and experience.

Overall, the findings suggest that the real-life scenarios presented in ClassSim not only provided problem-based tasks which were highly conducive to the ‘orientation’ of the pre-service teachers, but these real-life scenarios also facilitated the identification of the pre-service teachers’ deficiencies in knowledge and skills. Although the majority of the first year pre-service teachers did not propose how they would address their identified deficiencies in knowledge/skills, the findings indicate that many assumed that this knowledge and/or skill would be acquired via university coursework and their future field experiences throughout their degree.

## **Motivation**

For the purpose of this inquiry the aspects of ‘Motivation’ are discussed according to four factors, including success, volition, value, and enjoyment in relation to the first-year pre-service teachers’ engagement with ClassSim.

### **Success**

Learners, whether they are children or adults, want to feel that they are successful. In this inquiry, two of the ten first-year pre-service teachers were able to articulate a sense of achievement through their engagement with ClassSim as it applies to ‘Motivation’. This came in the form of internal motivators. One of the internal motivators of ClassSim came in the form of the user achieving a pre-defined purpose, such as better understanding the role of a teacher or gaining knowledge about teaching/learning. Another internal motivator is the sense of job satisfaction that comes from feedback. This occurs after a decision is made and is in the form of ‘Student Updates’. The user can access ‘Student Updates’ to monitor the progress of targeted children in relation to the decision they made. In addition to visual feedback, the user can access expert commentary.

During an interview Kellie identified that she achieved feelings of success through her engagement with ClassSim. Her success was twofold. She not only felt a sense of accomplishment at her increased understanding about the role of a teacher, she was also

able to understand and rationalise why a decision was preferable or not. She explained that it was not just about enjoyment; it was also about achieving some success in learning something new and valuable.

I think it made me actually process the information I was given rather than just forget it all. I really wanted to know what was happening so I actually started processing the information and going ‘okay well that really was a good decision because of these reasons’ or ‘the implications of doing guided reading are blah blah blah’, so it actually made me think about the information and process it, rather than just enjoying the ride (I\_Kellie\_23/07).

Thus, it appears that the nature of ClassSim required Kellie to understand the information presented and make decisions according to this. Through this process Kellie became successful, as she was able to take control and understand and articulate the rationale for her decisions.

Another way in which some first-year pre-service teachers gained a feeling of ‘success’ was through the instant feedback provided by the ‘Student Updates’. Rachael commented that through her use of this tool she was able to gauge how well the students were progressing and how decisions affected them.

The updates were good. I was able to keep track of the kids and see if any of my decisions affected them in a good or bad way. Then you can use that to make your next decision. You know, check how you’re going (I\_Rachael\_25/07).

Through the instant feedback of the ‘Student Updates’, Rachael was provided with the information she needed to proceed through the decision-making opportunities presented in ClassSim.

It is important to note that the design of ClassSim can also affect the users’ feelings of success via the ability to allow pre-service teachers to design a two-hour ‘literacy block’ (creating ownership of the task) and the use of a built-in clock designed to encourage the efficient use of time (ClassSim is equipped with an in-built clock, which counts down the two hours of the literacy block as the user progresses through the lessons chosen). The user may feel success when they created their own ‘literacy block’ and/or



when they were able to make decisions within the time permitted. However, the first-year pre-service teachers did not discuss these two aspects.

### **Volition**

Through the design of the virtual learning environment, the users were empowered to make decisions that can affect their virtual classroom. This ability, to make decisions is a key motivator in adult learning. Two of the ten first-year participants made comment on this ability.

During an interview Jasmine expressed frustration with her Demonstration School visits, explaining that she was merely an observer in another teacher's classroom where she had no control over the decisions made in the class. Jasmine continued stating that the virtual learning environment provided her with the responsibility to make decisions regarding the running of her virtual classroom.

We are there [at the demonstration school] going along for the ride, but it is someone else's journey and somebody else's decision-making, whereas in the sim we are making the decisions (I\_Jasmine\_29/03).

Thus, Jasmine found the design of the ClassSim to be a highly motivating factor as she had the power to make decisions that affect the progression of the class.

Rachael made a similar comment regarding her decision-making capabilities during the first few days of her field experience. "At the moment we don't do much. We sorta [*sic*] just watch for now and I don't make any decisions" (I\_Rachael\_29/03). It is reasonable to suggest that Rachael found the ability to take control over her own virtual classroom a motivating factor of her engagement as she openly expressed disappointment at not having the power to make any decisions in her field experience class.

Overall, the ability to make decisions with ClassSim appeared to be a motivating factor for the first-year pre-service teachers' engagement with the environment.

## Value

As previously discussed, adults will commit to learning when/if the goals and objectives are considered realistic and important to them (Speck, 1996:36). Thus the first-year pre-service teachers must feel that engaging with ClassSim will fulfil a worthwhile purpose. The findings indicate that three of the ten first-year participants commented on the motivational value of ClassSim.

During an interview, Sarah explained that she was able to gain a better understanding of a number of teaching strategies through her use of the summary material, the practical scenarios that depict them, and her university coursework.

I didn't really know any of the technical words or things like that, like I knew a 'literacy block', really what's involved in it, but not how they look ... I sort of get it now; I kind of see how it all connects to like what they are teaching us in class (I\_Sarah\_26/07).

Therefore it appears that Sarah was able to make some connections between her university coursework and the practical examples presented in ClassSim, in particular what a 'literacy block' is (learnt as part of her university coursework) and how a 'literacy block' might look in practice (learnt during her engagement with ClassSim). Thus it can be interpreted that Sarah was able to appreciate the value of ClassSim as a learning experience, and this reinforced her 'motivation' to continue engaging with the virtual environment.

Serena was able to utilise her experience with ClassSim to build her knowledge base about a number of teaching strategies, in particular questioning techniques. Through her use of the support material and practical scenarios presented in ClassSim, Serena was able to expand her understanding of questioning and build her knowledge of strategies to incorporate in the classroom.

They [support material] really helped with some of the things like the questioning techniques. I could only think of a few, so they helped with what other ones are out there ... I was able to think of them when it came to the

classroom, so I just didn't have one idea I had a whole heap of ideas (I\_Serena\_25/07).

Therefore Serena found her engagement with the ClassSim to be a valuable experience as it supported her developing knowledge about effective literacy teaching strategies. Overall, the findings suggest that Serena was 'motivated' to continue engaging with ClassSim, as she was able to appreciate the value of the learning experience.

Bruce commented that ClassSim was a safe setting in which he was free to experience new opportunities and trial decisions. He explained that in a 'real' classroom you do not have the luxury of repeating a lesson that did not go as expected, but in ClassSim you do.

I think the best part about it was just being able to try things. You've definitely got an opportunity to experience the effects of your decisions that you would get in the classroom. So in the classroom you went 'all right, I'm going to try this' and it may or may not have worked but that was it. You don't get the opportunity to have that lesson again or to completely start over and put in a new block first, cause in a classroom it's over now (I\_Bruce\_26/07).

Bruce found ClassSim to be a valuable learning experience as it allowed him to revisit lessons, which have not progressed or resulted the way that was planned. The ability to revisit and repeat lessons increased Bruce's 'motivation' to engage with the virtual learning environment.

Many first-year pre-service teachers commented on behaviour management as an area of anxiety throughout this inquiry. In his field experience reflections Bruce wrote:

Disciplining the students was the main factor that I will need work on. I will need to have general disciplining actions I can use such as 'freeze' or 'hands on heads' when all the children will stop what they are doing and listen (I have seen these at school, in ClassSim and heard about it at uni) (FER\_Bruce\_18/06).

This suggests that Bruce saw his engagement with the virtual learning environment to be valuable as it was a close representation of what he was experiencing in a 'real' classroom.

Overall, the findings suggest that majority of the first-year pre-service teachers found their engagement with ClassSim to be a valuable and worthwhile experience.

### **Enjoyment**

In order for any learner to stay motivated, they must feel some enjoyment in either the learning process or in the knowledge/skill they have acquired as part of the learning experience. The findings indicate that the first-year pre-service teachers enjoyed engaging with ClassSim. This was often linked to the belief that ClassSim was a safe environment in which they were free to take chances with their decision-making opportunities, some even likening the virtual learning environment to a game. Furthermore, the findings showed that two of the ten first-year pre-service teachers made specific comments regarding their engagement with ClassSim as a pleasurable experience.

During an interview, Daniel identified the ClassSim as a safe environment in which he was able to take chances not usually associated with field experiences. In his view it was a game that closely resembled a ‘real’ classroom, without the fear of affecting ‘real’ children. He also suggested that there was no right or wrong answer, so essentially it was fun to ‘play’.

On the ClassSim when you’re practising on the program. You can make a decision; you can fix the wrong decision, or change it to a different decision just to see what the consequences would be. Whereas in a classroom it’s not a game it’s the real thing ... I’d never seen a program like that so to begin with I was just clicking on everything then I sort of went back and thought about what I’d done ... on reflection you can look back to see if that was the right thing to do, or the wrong thing to do, or a different thing you can try next time when essentially there is no right or wrong. It was kinda [*sic*] fun (I\_Daniel\_20/03).

Thus it appears that Daniel explored the virtual learning environment without fear of adversely affecting the children in the class. He felt safe in that if he selected a ‘wrong’ decision there would be no unwanted repercussions, as the ‘back’ button would undo everything. This may have increased his motivation to use ClassSim.

During her first interview, Sarah explained that she had no structure in mind whilst creating her virtual literacy block; she simply followed the literacy episode options as they appeared on the screen, and when presented with a decision-making opportunity she often trialled a number of the available options. Sarah also explained that she thought of ClassSim as a game to be played.

I didn't really think about it. No not really. I just sort of went through the list. I'd quickly read some of the information and I'd click on either decision to see what it had to say then click 'back' and try the other one. It was like I wanted to play the game first, then learn it later (I\_Sarah\_27/03).

It can therefore be assumed that Sarah found engagement with ClassSim to be an enjoyable experience, one in which she could explore before gaining any valuable knowledge it had to offer. Overall, Sarah was motivated to learn as she found some enjoyment in the learning experience provided by ClassSim.

Overall, the findings indicate that the majority of the first-year pre-service teachers were motivated to engage with the virtual learning environment provided by ClassSim as they considered that they achieved success, had the volition to make decisions, and found their engagement to be a valuable, worthwhile, and enjoyable experience.

## **Experience**

Adults enter the learning environment with previous experiences and knowledge. With this extra base of knowledge and skills come a number of bias and assumptions. Therefore, it seems that although experience is important in adult learning, what is of more importance is how the adults use their experience to learn more effectively. The principle of 'Experience' is discussed according to what the first-year pre-service teachers based their decisions upon and their reflections of their experience.

## **Previous Knowledge and Experience**

The first aspect of ‘Experience’ relates to the adult learners’ abilities to draw upon previous experiences to aid their learning. Throughout the first semester, the pre-service teachers were exposed to numerous learning experiences including field experiences, university coursework and engagement with ClassSim. Seven of the ten first-year pre-service teacher participants were able to identify from where they drew their knowledge and experience when faced with a teaching-related task.

Kellie commented during her interview on her ability to draw upon her experience with ClassSim to better understand the structure of a literacy block. Whilst on field experience Kellie found that while the literacy block she observed had a different focus from the one she experienced on ClassSim, the underlying framework was the same, thus reinforcing the concept of a ‘modelled, guided, and independent’ structure.

I mean my literacy classes were quite different but the same structure. I saw it in different classes and experiences. The way things were introduced and dealt with in the classroom, yeah so there were lots of similarities. I mean basically modelled, guided and independent work, and everything leading up to that was all the same (I\_Kellie\_23/07).

Sarah also gained a better understanding of structure due to her experience with the virtual learning environment and university coursework. She explained that although the concept of ‘modelled, guided, and independent’ seems to be a logical sequence of learning experiences, the concept eluded her until it was made more explicit in her university coursework and demonstrated in ClassSim. This is also evident in her use of the virtual environment, as she simply followed the episode options as they appeared on the screen.

I think ClassSim along with uni work helped me understand how to teach something new. How you’re going to start with the modelling then to move on to see how the modelling would benefit, like to see you’d need to do it first. I mean that’s something if I’d thought about it, I probably would of realised it, but being first year and just starting, I didn’t really know. I think it’s [ClassSim] been good like teaching structure and stuff, because you can see that you can’t really teach a ‘Days of the Week’ lesson without teaching the Days of the Week

first, it's obviously a logical sequence. But it was something I hadn't really considered, like I know how to structure a lesson but a whole lesson block, I hadn't really thought about (I\_Sarah\_26/07).

Therefore it appears that both Sarah and Kellie were able to draw upon their knowledge and experience gained from engagement with ClassSim to better understand the framework that underpins most literacy learning experiences.

Whilst on field experience Rachael claimed that her experience with ClassSim helped her to feel more confident to make decisions in her field experience classroom. Rachael explained that when she used ClassSim she was able to make a number of decisions on her own. This helped to develop her confidence in making decisions in a 'real' classroom without heavily relying on her supervising teacher for constant guidance and direction.

It [ClassSim] helps you prepare for it [field experience]. It [ClassSim] just gives you a little bit of insight before you go into a school, because if I'd gone to the prac before I'd worked on the ClassSim I would have been a little bit more unsure about what to do. I definitely wouldn't of thought I'd be making any class decisions. Even if a child needed to go to the toilet, whether you let them go or not, I would have been a lot more hesitant. I would of relied a lot more on my supervising teacher (I\_Rachael\_25/07).

Rachael made reference to a particular decision-making opportunity within ClassSim, which asks the user to decide whether or not to allow a child to go to the bathroom. Rachael stated that she encountered a similar decision whilst on field experience, and drew upon her virtual experience before making a decision. This indicates that Rachael referred back to her virtual experiences with ClassSim while on field experience.

Kim explained that while on field experience she attempted to implement strategies she experienced during her experience with ClassSim. After her initial attempt she encountered some problems, as many of the students had forgotten what was expected of them. She came to the conclusion that new behaviour management strategies require time to become part of the everyday practicalities of a classroom.

I tried to implement strategies from ClassSim when I first started [my field experience]. I know in the ClassSim it was like eyes to the front, this is how we all sit. I tried after about the third day to try and implement a similar thing. I told them, ‘when I am taking the class this is how I want you to respond’. It started okay; I think it was the kind of thing I need more time to implement. At first it was like ‘this is what we’re going to do’ and then next lesson half of them remembered what to do. So it took a little while to get that structure down. But the concept of it was good (I\_Kim\_25/07).

Kim’s description of how she drew upon her experience with ClassSim to implement behaviour management strategies during her field experience is an example of using recent experiences to build upon her knowledge of behaviour management in a classroom.

Serena was also able to draw upon her experience with ClassSim whilst on field experience. During an interview Serena explained that through her experience with ClassSim she realised that each student has different needs in the classroom, and that each student brings with them differing levels of understanding and a myriad of personal issues. Whilst on field experience she endeavoured to not only gauge how the class responded as a whole, but to also pay attention to the students who were struggling.

They [the ‘Student Updates’ on ClassSim] really made me realise how each individual student can be so different and what really happened in the back of their minds. So when I went into class I wouldn’t just see how the whole class responded, I was looking out for the kids that were in the back, were they engaging with the lesson? The kids that were having trouble with it, were they understanding it? Whether something was going on with them. One of the things I did realise on prac that I learnt from ClassSim is that things in the playground and things that were happening outside of the classroom are going to come into the classroom. There is nothing you can do about that. That does affect their learning (I\_Serena\_25/07).

Serena was able to utilise her experience with the ClassSim support material (‘Student Updates’) to better understand the differing needs of the students’ whilst on field experience.



Rachael explained that the concept of time management was introduced to her in ClassSim and was reinforced during university lectures. This knowledge was then drawn upon during her field experience.

The episode selections definitely helped with the lesson planning and just thinking about structuring the classroom and the way that you manage your time in the classroom because I noticed that when I went on the ClassSim I saw that they had all their times. So at 9:01 the kids lined up in front of the classroom, at 9:05 they did something else. So you really have to watch the time. I mean they always say in the lectures ‘you’d be really pressed for time with the amount of curriculum’ so that was something I thought about on prac (I\_Rachael\_25/07).

Thus Rachael utilised her experience with ClassSim and her university-based lectures to gain insight about time management. She applied this understanding to her field experience. Therefore Rachael was able to make strong connections between her university coursework and her practical experiences (via field experience and engagement with ClassSim).

After Michael had used ClassSim and completed his first field experience an interview was held. During this interview the researcher asked Michael about the construction of his virtual ‘literacy block’ in ClassSim and if he would design it differently now he had been in a ‘real’ classroom. Michael explained that he would design it differently due to what he observed during field experience. He explained that he now has a better understanding of the development of a ‘literacy block’ in terms of keeping a consistent theme throughout the lessons and to cater for the needs of the class.

I probably would. The year two class I was in were all underdeveloped in terms of their reading levels. The teacher was concentrating on reading and I could see how the reading lessons can benefit their writing and how writing lessons benefit their reading. She was modelling the reading and then she would model how to write. I would probably start off with a couple more reading activities, rather than a mix of everything, and then do what she did, which was an in-depth analysis, like how the writer structured their sentences. Before I just chose a mix of them, cause I thought they would get bored. I didn’t think about going in-depth before (I\_Michael\_24/07).

It appears that Michael’s knowledge and understanding about the structure of a ‘literacy block’ was strongly influenced by his field experiences. However, it is likely that his

experience with ClassSim provided his first exposure to the teaching of a 'literacy block'. His field experience provided him with further experiences to base his knowledge and understanding upon.

When asked about her engagement with ClassSim in regards to her field experience, Leonie explained that her engagement provided her with the opportunity to practice her skills and knowledge needed to be a teacher. "ClassSim was just like studying before the real thing, you know what I mean, like you sort of read up on how to drive a boat before you actually get in the boat and drive it" (I\_Leonie\_23/07). Therefore it appears as though Leonie used her experience with ClassSim to explore the context of a classroom and to experiment with her decision-making, before her field experience. It can be interpreted that Leonie used ClassSim as an introductory practice session before experiencing the 'real' thing on field experience.

Kellie had a similar experience with ClassSim. It was an environment in which she could apply her learning before experiencing it in the field. She explained that she obtained much of the information required to take on the role of a teacher through her university-based learning, and was able to experience it on field experience, however what was missing was a place to experiment with the knowledge and skills she was developing.

I think maybe it's a reinforcer, so the theory that we learn is very good and when you're on prac you experience it, ClassSim is an another component, sort of bringing it to life before you experience it, rather than just being theory (I\_Kellie\_23/07).

Kellie found her experience with ClassSim to be valuable as she was able to use it as a practice ground to test her developing skills and knowledge.

The findings indicate that the majority of the first-year pre-service teachers were able to draw upon their experience with ClassSim (and the university coursework and field experiences) when faced with a teaching-related task.

## Reflecting on Experience

The opportunity to reflect on experience helps to create an effective learning experience for adults (Knowles, Holton and Swanson, 1998). Adult learners need time to contemplate the ramifications of the learning experience to their experience and responsibilities. Criticos (1993:162) points out that experience alone is not valuable; rather, “what is valuable is the intellectual growth that follows the process of reflecting on experience. Effective learning does not follow from a positive experience but from effective reflection”. In addition, Garvin (1993) shares the importance of fostering an environment that is conducive to learning, including time for reflection and analysis. During this inquiry, the first-year pre-service teachers were required to reflect upon their field experiences and had access to a ‘Thinking Space’ (within ClassSim) that enabled them to reflect upon their professional learning and self-identity. The findings indicated that five of the ten first-year participants were able to identify their assumptions about teaching and could articulate these assumptions during interviews with the researcher.

During an interview Kim noted that it was her previous belief that staying inside before class to prepare for the morning lessons was a more effective use of her time, as opposed to going outside and greeting the children and parents. She explained that she initially thought it was more important to be well organised before class, however as her field experience progressed she found her priorities changed.

Definitely, it [ClassSim] showed me some of the things that I initially didn’t think of when taking into account ... most notably, whether to go out in the playground in the morning to talk to parents and children, or to stay in and plan ... at first I thought it would be helpful to stay in the classroom, but as I got to know the students more and met some of the parents I found myself getting to school earlier to prepare for class and then when the students started to arrive going out and talking to them and their parents about uni and their child’s progress. I found it to be really important to be seen by them before class (I\_Kim\_25/07).

Kim explained that her engagement with ClassSim helped her to gain an appreciation of the importance of the decisions she makes as a teacher. After her engagement with ClassSim, Kim believed that her decision to stay inside and prepare for the day ahead

was most beneficial; however during her field experience, Kim came to the realisation that it may be more beneficial to do both (start early and prepare for the lesson and go outside to greet the students and gauge their moods and behaviours). Thus, through her field experience Kim was able to assess and reassess a previously-held assumption.

Daniel was also able to reflect upon a previously-held assumption. During an interview Daniel stated that prior to his engagement with ClassSim he was previously unaware that students often respond differently to teacher expectations and may not outwardly display their level of engagement. He explained that through his use of the 'Student Updates' he was able to better develop an understanding of student responses and needs.

One aspect I really liked was the student updates; giving insight to how some children might think. This was very useful later in the classroom as I realised that the children may in fact be thinking very differently to how I expect. The sim showed me that so I could expect and cater for it in the real classroom environment (I\_Daniel\_23/07).

Thus it appears that Daniel's engagement with the virtual learning environment was an effective learning experience as he was able to reassess his assumptions about student thinking.

Leonie was another student who was able to reflect upon previously-held assumptions as a result of her engagement with ClassSim. During an interview, Leonie stated that she was able to reflect upon her previous experiences (including field experiences and her engagement with ClassSim) to identify her assumptions about students' issues and their different needs.

As far as the classroom management side goes, certain kids had issues like home issues, like they'd bring their family issues to class. One boy in particular, he had issues at home in regards to his family and his role in his family, due to a few different circumstances and you would see that effecting him in class. So you know what I mean, in terms of the ClassSim it's sort of gives you an idea of what issues the kids might bring. You see, initially when you sign up to go to uni and become a teacher you sort of think every kid gets taught the same and then you realise it's not like that at all, because how'd you teach him is not the same as another kid who has no big issues. That's what's happening to the kids in ClassSim they've all got their own issues, some are excelling, and some are having trouble with English. I didn't really have language as an issue in my

classroom, but yeah I definitely saw how other issues can become distracting (I\_Leonie\_23/07).

Through her process of assessment and reassessment of assumptions, Leonie came to a better understanding about her professional learning regarding the needs of different students and the consequences of teaching decisions.

Leonie also reassessed her assumptions regarding the structure of a 'literacy block'. She explained that she was previously unaware that the sequence in which a teacher designs her lessons makes a difference to student engagement and behaviour.

In ClassSim, you sort of work out what you want to teach first and find out the repercussions of that, like for example doing 'story telling' first. The class will behave differently to if you choose another option like doing maths first. And then that was the same in real life, you saw that happening. 'Spelling' first was the norm in my class, but if something different, like if they did 'show and tell' first then the class went a little bit chaotic and then you pretty much lost the whole morning ... you'd sort of get those scenarios in the ClassSim. So by mixing around the order of things done in the day, things sort of changed completely how the kids behaved. Yeah little stuff like that you wouldn't think when you start of studying that that's going to make a difference, but when you do it you realise it all matters (I\_Leonie\_23/07).

Through her engagement with ClassSim and her field experience, Leonie was able to reassess her belief that the structure and sequence of a lesson block was a trivial matter. Both of these learning experiences were effective in that they prompted Leonie to reassess her previous assumption and aid in the development of her knowledge about effective literacy teaching strategies.

Via his engagement with ClassSim, Bruce came to a better understanding about questioning students. He explained that previously he would have simply asked students whom he knew would give him the answer he required. He suggested that ClassSim forced him to think about this decision and thus reassess his tendency of asking the same students to respond to his questioning.

The ClassSim gave you an opportunity to try and make a balance between it, because I found when I was on prac it was very easy to just ask the kids at the front and you knew would know the answers cause that would help your lesson

plan. They would give you the answer you wanted, whereas the ClassSim sort of made you reflect, by doing that your ignoring Harley and Gavin and such so that so it made you then go ask someone else, even though it's probably easier to pick these students. It [ClassSim] gave you a chance to make those decisions, like who am I going to ask? Where am I going to go with that answer to benefit general students, not just to help the lesson progress nicely? (I\_Bruce\_26/07)

Thus it appears that Bruce's experience with ClassSim provided him with the opportunity to reassess his tendency to question children he knows will give him the correct response.

Michael commented on a previously held assumption. During his first interview Michael stated that; "You can always tell the good kids, like cleaning the teachers' desk and that sort of thing. And the bad ones are always mucking up" (I\_Michael\_22/03). Therefore Michael had an assumption that there is a 'good' child and a 'bad' child and this was easily recognisable through their outward behaviour. This assumption was reassessed during his final interview. He explained that he was often unaware of the thoughts of the children in his class, and was unsure if they were on-task or not.

You don't always know what's going on in their heads. Some of them have home issues and muck up, some daydream and keep quiet so you don't always realise their not on task, and some talk, but are listening. You just don't always know (I\_Michael\_24/07).

Therefore through his engagement with ClassSim and his field experience Michael was able to assess and reassess his assumptions about student behaviour and engagement.

After her field experience, Rachael was asked what she would do differently in ClassSim had she had the experiences she now has. She explained that she would do a number of things differently in both contexts. Her biggest concern was that her field experience students knew she was straight out of high school and she was a first-year student. She expressed regret in divulging this information with her students as she felt she lost credibility as a teacher. She also explained that she would be more decisive in her decision-making.

I would definitely do things different in ClassSim, I think even prac, they knew that I was first year student, so they knew that I had just finished school, there were things like coming back I wouldn't tell them anything like that. I would think just be a lot more decisive; I'd just make decisions on the spot like yeah I could help you with that (I\_Rachael\_25/07).

Rachael was able to identify a number of choices made that she has since reassessed and it appears that she was able to turn an unfavourable experience into an effective learning experience. The findings also indicate that Rachael felt that her professional identity was negatively affected because her field experience students knew information about her personal background. It appears that Rachael was able to reflect upon her field experience, thus identifying how she can build a stronger professional identity.

In conclusion, the findings suggest that most of the first-year pre-service teachers were not only able to draw upon their previous knowledge and experiences when engaging with ClassSim, but many were also able to identify and reassess their prior assumptions, about the work of teachers and how they saw themselves as teachers.

### **Self Concept**

'Self Concept' refers to an adult learner assuming responsibility over their own learning. The literature suggests that the overarching notion of 'Self Concept' involves the adult learner growing from being a dependent learner to a self-directed learner (Knowles, 1980; Knowles, 1984; Knowles, Holton and Swanson, 1998). Through engagement with ClassSim the pre-service teachers were provided with the opportunity to become more self-directed, as they took responsibility for their own learning and subsequent directions. 'Self Concept' is discussed in terms of structure and support of learning experiences, reflection, and professional identity.

### **Structure and Support of Learning Experiences**

Engagement with ClassSim provided the opportunity for some first-year pre-service teachers to become more self-directed learners. As the design of ClassSim allowed it to

be used in a non-linear manner, it permitted the adult learner to follow the path that reflected their current interests and learning needs. Five of the ten first-year pre-service teachers utilised the virtual learning environment's branching opportunities to follow areas of interest, skip sections already understood, and to gain access to multiple forms of presentation of material. Thus ClassSim presented the first-year pre-service teachers with classroom-based scenarios that were supported with relevant sources of just-in-time information that were available for those who needed it.

The researcher observed Michael's engagement of ClassSim. It was noted that he accessed the summary material a total of six times (O\_Michael\_08/03), in order to make more informed decisions and to gain a better understanding of various educational terms and techniques (O\_Michael\_08/03). During an interview Michael commented on the information he acquired during his use of one of the summaries (in particular on 'literacy blocks'). He explained that he was unfamiliar with the terminology and was surprised when he found out that a 'literacy block' was broken down into episodes that could be sequenced by the teacher.

I didn't really know any of the technical words or things like that, like I knew a 'literacy block', really what's involved in it, but not how they look. I didn't know that they are broken down; originally I thought that lessons were just thrown together and not thought out into just tiny separate episodes. I sort of get it now; I kind of see how it all connects to like what they are teaching us in class (I\_Michael\_24/07).

Furthermore, observational data collected during Michael's engagement with the virtual learning environment showed that he continued using the summary links to gain additional information about unfamiliar jargon, teaching techniques and strategies and to assist in his decision-making throughout the simulation.

Michael - Decides upon 'same ability grouping' during 'cut and paste activity'. Reads 'same ability grouping' summary. Goes back and changes to 'table grouping'. Reads summary 'table grouping'. Enters 'Thinking Space' and writes about grouping of students (O\_Michael\_08/03).



It appears that Michael made use of the support material available to increase his knowledge and to inform his decisions. The structure of ClassSim enabled Michael to follow his own learning path and to have a more self-directed learning experience.

On a number of occasions Rachael accessed the summary information within ClassSim, either before she made decisions or to better understand educational terms and techniques (O\_Rachael\_08/03). When questioned about her use of this support material during her final interview Rachael said; “I definitely went into the summary links [and] I went to some of the web sites that were available” (I\_Rachael\_25/07). This is supported by her conversation with Gail whilst using ClassSim.

Gail - Are you reading the other stuff?

Rachael - What the summaries?

Gail - Yeah.

Rachael- Yeah, I needed to. If I don't understand what something means (O\_Rachael\_08/03).

Further observational data also supports this claim. “Rachael looks at information regarding the NSW Model of Pedagogy” (O\_Rachael\_08/03), and five minutes later, “Rachael is still looking at information on Pedagogy Model” (O\_Rachael\_08/03).

Another example of Rachael using the summaries to gain further insight about a teaching strategy is seen in her discussion with Gail about the grouping of students.

Gail - With the groups I wouldn't put them in table groups, I wouldn't put them in friendship groups and I wouldn't put them in same-ability groups.

Rachael - Why wouldn't you put them in table groups?

Gail - Cause they are always with the same kids if they go in their table groups.

Rachael - Have a look in the summary. It might tell you which is best for what activity (O\_Rachael\_08/03).

Rachael utilised the summary information on a number of occasions to supplement her knowledge base and to inform her decision-making.

During an interview Jasmine made comments on her use of the summary material to aid in her understanding of key concepts and theories. She explained that the real-life

scenarios gave her the context, whereas the summaries provided the background information of how and why.

It helped you to link theory to practice using things like the summaries and understanding the theory and the background ideas. With the notes you see the theory behind it but then with the actual ClassSim you see how it was applied and how it worked, like when you read about the behaviour management program, you then see how it was going work and you could of gone to the link to see what it was all about, and why the teacher was using it, and how she was using it, and that sort of thing (I\_Jasmine\_25/07).

It appears as though Jasmine's learning experiences within ClassSim were enhanced through her use of the support material.

The findings reveal that Serena also used her engagement with ClassSim's support material to guide her learning. Observation data showed that Serena accessed the support material to build her knowledge base (O\_Serena\_08/03). During an interview Serena explained that she had limited questioning techniques to draw upon and when faced a practical scenario that required her to think about questioning, she was able to extend her knowledge via the support materials.

They [support material] really helped with some of the things like the questioning techniques. I could only think of a few, so they helped with what other ones are out there ... I was able to think of them when it came to the classroom, so I just didn't have one idea I had a whole heap of ideas (I\_Serena\_25/07).

Thus Serena utilised the support material available in ClassSim to gain insight into questioning techniques and to follow her own learning needs.

During an interview Sarah explained that she worked though the episode selection page in a linear format by following the literacy episode options as they appeared on the screen. Further when presented with a decision-making opportunity she often trialled a number of the available options.

I didn't really think about it. No not really. I just sort of went through the list. I'd quickly read some of the information and I'd click on either decision to see what it had to say then click 'back' and try the other one (I\_Sarah\_27/03).

Observational data confirms this.

Sarah - Chose fourth reading episode (has selected all reading episodes now - she seems to be following list) (O\_Sarah\_08/03).

Sarah - Reprimands Gavin. Reads page. Clicks 'back'. Decides to ignore him (O\_Sarah\_08/03).

Sarah did not utilise the non-linear design of ClassSim when selecting episodes (designing her 'literacy block'), however when making decisions about behaviour management and classroom organisation she explored the scenarios in a non-linear manner thus discovering some possible consequences to her decisions. One interpretation of this may be that Sarah may have dismissed the option to design a virtual 'literacy block', as Sarah was more concerned about her approaching field experience, in particular about the decisions she may have to make regarding classroom management. Thus her engagement with ClassSim enabled her to explore potential consequences of decisions, enabling her to follow a path of learning that suited her immediate needs.

The first-year pre-service teachers found the virtual learning environment to be an effective learning tool, as it not only presented the user with classroom-based scenarios, it also enabled the adult learner to follow a path of learning that most appropriately suits their needs (thereby becoming more self-directed).

### **Professional Identity**

"Teaching is a profession that requires skills, dispositions (personal qualities), and knowledge in four areas: subject matter, child development, teaching methodology, and self-awareness/identity" (Allen, 2005:1). Thus, a teacher's professional identity is shaped by their understanding of the theory of teaching/learning and their unique set of life experiences. Barty (2004:2) suggests that a teacher's professional identity "impacts

a teacher's philosophical beliefs, and ultimately, the pedagogical approaches used in their classroom", and thus plays an important part in pre-service teacher education. Seven of the ten first-year pre-service teacher participants utilised their engagement with ClassSim (in conjunction with their other learning experiences) to further develop their professional identity.

As previously discussed, Rachael experienced some regret about allowing her field experience students to know that she was a first-year pre-service teacher straight from high school.

They knew that I was first year student, so they knew that I had just finished school, there were things like coming back I wouldn't tell them anything like that (I\_Rachael\_25/07).

In her field experience reflections she reiterated this, explaining that she lost credibility as a teacher by divulging this information.

I wish I had never told my students that I was a first year student teacher. They knew that I had just finished high school, which took away from my credibility (FER\_Rachael\_11/06).

Rachael felt that her professional identity was somewhat hindered by the fact that her field experience students knew information about her background. However, an alternative interpretation to this may be that she did not perceive herself to be a teacher, thus at this point in time; she has not developed a strong sense of a professional identity. Thus it appears that Rachael's reflections of her field experience enabled her to identify an area towards which she can work.

Serena made comments about her growth of professional identity during her first interview. She suggested that she was extremely anxious about her field experience and whether or not she was capable of teaching. However, after her engagement with ClassSim her 'self concept' evolved to a state that she believed she was capable of teaching.

It was a lot of fun. It was a really good experience, because I actually got to see that I could actually teach, I wasn't just thinking that I might. I used to get really scared about it in my head. Like, what am I going to do if that happens or what am I going to do if this happens (I\_Serena\_23/03).

During her second interview Serena explained that the ClassSim presented her with an opportunity to be a teacher in a classroom, rather than a student.

Before I was a student and I looked at things completely different but with the ClassSim it really was a teacher view ... So it makes you think 'oh yes I'm now a uni student, I'm using a ClassSim, I see how a teacher role can be'. Then you go to prac and 'oh I'm a teacher' (I\_Serena\_25/07).

Serena's engagement with ClassSim was the experience that initiated Serena's development of a professional identity (the belief that she was a teacher rather than a student), which was reinforced by her field experience.

Jasmine made similar comments. She explained that before engaging with ClassSim she felt like a university student and it wasn't until she was able to direct her own virtual class that she felt like a pre-service teacher. She continued by explaining that her field experience further developed her 'self concept' of a beginning teacher.

I found when I'm at uni or around here even though I'm starting to be a teacher I'm going to be a pre service teacher, I'm just a uni student. But with the ClassSim I actually sat down and went 'I'm actually starting to become a teacher'. And when I got to the prac I was like okay 'I'm a teacher', sort of thing. But when I first started doing a prac I thought 'oh no I'm just an observer. I'm not really supposed to be doing anything just ignore me' cause I was just a little bit shy at first, but as it got on and I did my full prac it was just like 'okay I'm a teacher'. This is a classroom listen to me (I\_Jasmine\_24/07).

Jasmine's engagement with ClassSim was a step in the process of developing her professional identity as a beginning teacher. The findings also indicate that her field experience further developed this new professional identity.

During their engagement with ClassSim, Kellie, Michael, Kim, Serena, and Daniel made comments in their 'Thinking Space' regarding their developing teaching beliefs. Kellie suggested that the class rules presented in the virtual learning environment were

poorly worded. She explained that a certain amount of noise should be expected in a productive classroom environment and the class rules should reflect this belief.

#### CLASS GOALS / RULES

1. We will always work quietly.

I disagree with the above statement and the use of the word “always”. Sometimes it is necessary for children to talk to the person next or across from them about the work that they are currently doing, as it helps their progression in their work.

I believe that the children need to use their “indoor voices”, however at the same time work quietly (TS\_Kellie\_12/03).

This suggests that Kellie’s approach to classroom management had begun to develop and it appears as though Kellie’s engagement with ClassSim enabled her to identify and articulate these beliefs.

Michael made comment in his ‘Thinking Space’ regarding his beliefs about rewards and punishments. Through his engagement with ClassSim he noticed that the virtual teacher often chose a select few students to praise, even when a larger number of students were behaving in a similar way. He suggested that whole class rewards may be more effective in this type of situation.

Rewards and punishments systems are always helpful for maintaining discipline in the class. Other than single student rewards, entire class rewards are also advantageous for when it is all students that are well behaved. This teacher just chooses a few out the entire class who have done what she has instructed. She teacher must now choose between all students who are doing the exact same thing. An entire class reward system will come in handy here (TS\_Michael\_15/03).

Thus, Michael’s engagement with ClassSim facilitated his ability to identify and articulate his teaching philosophy regarding rewards and punishments.

In Kim’s ‘Thinking Space’ she reflected upon the same situation, where the virtual teacher selected Rebecca to praise for a behaviour displayed by a number of students.

Using Rebecca to tell that class how to focus, I feel was slightly wrong as it makes the other kids think she is more important than they are. She could have

said ‘now who knows how to sit when we want to learn’ or similar that way it gives opportunity for students to be praised and also engage classroom discussion (TS\_Kim\_28/04).

Thus, it appears that Kim was able to identify and articulate a strong teaching belief regarding the preferential treatment of a select few students.

In her ‘Thinking Space’ Serena explained that the teacher should be modelling the behaviour she expects from her students. Although she agreed with the strategy implemented by the virtual teacher, she felt that there was a range of other techniques that would have worked as effectively.

There are several approaches the teacher could have used, the praise she used would have been effective, however I think it also helps if the teacher demonstrates what she wants the students to do. So if she wants them to sit up straight she should model sitting up straight. This is helpful for the students to get their cue from (TS\_Serena\_12/03).

Therefore the findings indicate that Serena’s engagement with ClassSim aided her development of a teaching philosophy regarding the teacher as a role model.

In his ‘Thinking Space’ Daniel explained that one of his main goals throughout his virtual teaching was to encourage all of the class members to contribute to class discussion.

I am constantly trying to involve the students by having them input into the lesson. I feel it is important to retain their attention as well as feel that they are part of the class and play a role within it (TS\_Daniel\_16/03).

This suggests that Daniel’s engagement with ClassSim facilitated his ability to identify inclusion as a priority of his teaching philosophy. Overall, engagement with the virtual learning environment and subsequent use of the ‘Thinking Space’ enabled Kellie, Michael, Kim, Serena, and Daniel to experience and document their responses to situations that resembled real classrooms. Furthermore, the use of the ‘Thinking Space’ may have helped them to begin the process of developing their own personal teaching philosophy, thereby shaping their emerging professional identity.

During an interview Kim made comments about her field experience teachers' practices. Kim explained that her field experience teacher organised the desks in rows. She said that this format did not suit her teaching philosophy.

My teacher had two lots of row for each year and this separated the class. I personally wouldn't have done it this way because I think kids work best in groups (I\_Kim\_25/07).

Kim was able to observe another teacher's method and begin to rationalise why she would or would not use a similar strategy. Thus she was able to articulate the importance of group work in her own teaching philosophy.

Bruce's field experience reflections highlighted an area of his teaching that needed development; the pacing of lessons, student engagement, and positive reinforcement.

Basically, I need to slow down my lessons and keep the children focused. It was suggested I focus on giving out more positive reinforcement, although this may not be so successful with older students. Kindergarten children loved getting stamps, stickers and house points (FER\_Bruce\_18/06).

This suggests that Bruce's field experience reflection aided in the development of his professional identity, as he was able to identify areas (including pace, engagement and motivation) of his teaching that required further development.

Overall the findings suggest that through engagement with the virtual learning environment many of the first-year pre-service teachers were able to identify and articulate their emerging teaching philosophies and begin to see themselves as teachers, thus developing their own professional identities.

In conclusion, engagement with ClassSim enabled many of the adult learners to begin their progression from a dependent learner to a more self-directed learner. The findings also suggest that engagement with ClassSim aided the development of the first-year pre-service teachers' emerging professional identity (or 'self concept').



## **Summary of First-Year Pre-service Teacher Case**

Many of the first-year pre-service teachers were able to draw upon their knowledge and experience gained from field experiences, university coursework and engagement with the virtual learning environment to better understand key concepts and teaching strategies. The findings indicate that some of the first-year pre-service teachers were able to identify a number of their assumptions and often reassessed these assumptions during interviews with the researcher. Overall, the first-year pre-service teachers found the virtual learning environment to be an important tool in preparing them for their field experience, and as a tool to make connections between theory and practice.

Further, the findings suggest that the majority of the first-year pre-service teachers found their engagement with ClassSim to be a worthwhile learning experience as it presented relevant, virtual examples. The first-year pre-service teachers were able to experience situations often encountered as a teacher and engage in virtual problem-solving. Through this engagement in real-life tasks and problem-solving, a number of first-year pre-service teachers were able to identify areas in their current knowledge and/or skill base and identify areas that require further learning. Also the first-year pre-service teachers felt empowered to make decisions whilst engaging with the virtual learning environment as opposed to their initial field experiences in which decisions were vetted by the supervising teacher. The feeling of success in regard to decisions made within ClassSim provided positive reinforcement and made the experience enjoyable. Some likened the safety of the virtual environment in which they were free to take chances with their decision-making opportunities to a game.

# Chapter Six

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## **Third-Year Pre-service Teacher Case**

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The findings from the third-year pre-service teachers are presented in this chapter. The first section provides the contextual background of the case. The second section discusses the findings that emerged. The third section summarises the third-year pre-service teachers as a case.

### **Context**

In the year of the inquiry, the third -year participants were enrolled in a Bachelor of Teaching (Primary) degree. As part of their course requirements they must complete sixty days of practice teaching throughout the duration of their degree, and each year, a 'Professional Practice' supported practice teaching subject. This subject was designed to extend the third-year field experience by integrating the knowledge of curriculum planning, the ability to develop a situational analysis of a school and class and the preparation of a teaching program across the KLAs (DA\_23/07). During this subject the third-year pre-service teachers develop a five-week teaching program and implement it on field experience. This experience enables the pre-service teachers to better understand the state and school curricula, equity perspectives, teaching and learning strategies and assessment components. Reflection is a major pedagogical underpinning in this course as it is believed that reflection maximises the opportunity to learn the skills of teaching and other understandings of education during the professional experience (DA\_23/07).

### **The Third-Year Participants**

The third-year participants were purposively selected with predefined characteristics to ensure the collection of data from the widest range of personal experiences and backgrounds. Seven third-year pre-service teachers (five female and two male)

comprised the cohort of third year participants for this study. They were selected to represent the third-year students enrolled in this degree. Table 6.1 provides an overview of the third-year participants involved in the study.

<b>Name (pseudonym)</b>	<b>Age</b>	<b>Educational history</b>	<b>Average mark obtained in tertiary studies</b>	<b>Self-reported rating of past field experiences</b>
Mia	20 - 22	High school	85% +	Fair (2)
Lauren	20 - 22	High school	85% +	Good (4)
Zoe	20 - 22	High school	65 - 74%	Good (4)
Isabella	23 - 25	Bachelor of Arts	85% +	Excellent (5)
Marie	26 +	TAFE	65 - 74%	Excellent (5)
Mark	20 - 22	High school	75 - 84%	Average (3)
Ross	26 +	High school	75 - 84%	Good (4)

Table 6.1: Overview of third-year participants

Each participant is described in more detail.

### **Mia**

Mia was a 20-year-old female, enrolled in her third year of a Bachelor of Teaching (Primary) degree. Mia completed her Higher School Certificate (HSC) and progressed straight into university (S\_Mia\_16/08). During her degree Mia had achieved an average mark of 85+% (S\_Mia\_16/08). Mia indicated on a self-reported rating that her previous field experiences had been fair experiences (S\_Mia\_16/08).

### **Lauren**

Lauren was a 21-year-old female, enrolled in her third year of a Bachelor of Teaching (Primary) degree. Upon completion of her Higher School Certificate (HSC) Lauren entered university (S\_Lauren\_16/08). Throughout her studies at university she achieved an average mark of 85+% (S\_Lauren\_16/08). Lauren indicated that overall her previous field experiences had been good (S\_Lauren\_16/08).

### **Zoe**

Zoe was a 21-year-old female, enrolled in her third year of a Bachelor of Teaching (Primary) degree. Zoe finished her Higher School Certificate (HSC) and progressed straight into university (S\_Zoe\_16/08). Zoe had received an average mark of 65-74% (S\_Zoe\_16/08) during her degree. Zoe indicated that her first and second year fieldwork had been excellent experiences (S\_Zoe\_16/08).

### **Isabella**

Isabella was a 24-year-old female, enrolled in her third year of a Bachelor of Teaching (Primary) degree. Before beginning her Bachelor of Teaching (Primary), Isabella completed a Bachelor of Arts at the same university (S\_Isabella\_16/08). She indicated that her average mark obtained during her teaching studies was 85+% (S\_Isabella\_16/08). The average mark Isabella obtained during her Arts degree was approximately 75% (I\_Isabella\_20/08). Isabella's self-reported rating of her previous field experiences was good (S\_Isabella\_16/08).

### **Marie**

Marie was a 39-year-old female, enrolled in her third year of a Bachelor of Teaching (Primary) degree. Before entering university Marie undertook a Diploma of Nursing at TAFE (S\_Marie\_16/08) and subsequently was employed as a nurse in a retirement home for almost ten years (I\_Marie\_20/08). During her university degree Marie obtained an average mark of 65-74% (S\_Marie\_16/08). Marie indicated that her previous field experiences had been excellent experiences (S\_Marie\_16/08). Marie also has two children. Her youngest son was nine years old and her older son was twelve at the time of this inquiry.

### **Marc**

Marc was a 21-year-old male, enrolled in his third year of a Bachelor of Teaching (Primary) degree. Marc finished his Higher School Certificate (HSC) and progressed straight into university (S\_Marc\_16/08). Marc's grades throughout his university studies ranged from 65-84% (S\_Marc\_16/08) during his degree. Marc indicated that his

first and second-year field experiences had been “average” experiences (S\_Marc\_16/08).

### **Ross**

Ross was a 30-year-old male, enrolled in his third year of a Bachelor of Teaching (Primary) degree. Prior to his entry into university Ross was self-employed as a carpet cleaner (I\_Ross\_22/08). During his university degree Ross obtained an average mark of 75-84% (S\_Ross\_16/08). Ross reported that his previous field experiences had been good experiences (S\_Ross\_16/08).

Each third-year participant presented varied education and employment history, academic achievement, and experiences during the prior field experiences. These third year participants were purposively selected to account for the widest possible range of experiences and backgrounds to represent the entire third-year cohort.

## **Findings of Third-Year Pre-service Teachers**

The findings have been organised under the principles of andragogy (as described in chapter four).

### **Readiness**

There are three aspects of ‘Readiness’, which relate to the third-year pre-service teachers of this inquiry. These include purpose of engagement, value to learning, and timing of engagement, which are discussed further below.

### **Purpose of Engagement**

According to the principles of ‘Readiness’ adults need to know why they should learn something. Therefore the third-year pre-service teachers must feel that engaging with

ClassSim fulfilled a worthwhile purpose. The majority of the third-year pre-service teachers found the virtual learning environment to be an unnecessary tool in preparing them for their final field experience and that ClassSim was probably more suitable for first-year students. Four of the seven third-year pre-service teacher participants made comments of this nature.

After engaging with ClassSim Mia suggested that the virtual learning environment had a number of advantages for pre-service teacher education however, ClassSim gave her, as a third-year pre-service teacher, the opportunity to practice the skills she already had acquired. Further, Mia explained that ClassSim, if used with the first-year pre-service teachers, has the potential to be a useful introductory tool to teaching.

It's got its advantages for each stage that you're at; I think it's a good introduction for teachers when they start their teaching course, just to get them to really think about what teaching is about. Like when you're first starting out you really have no idea, like I came in not really understanding how you have to make all these decisions, whereas now I'm like 'oh yeah of course this is going to happen,' 'of course that's going to happen'. I guess that's why I thought I wanted it [ClassSim] to be quicker so I can just go 'right I've got to be able to make those decisions next year so I've got to be right to go', so I just choose that options and see what happens just to do a test run and sit there and try and take everything in. By this stage of my learning it's a good tool to be able to practice what you should already be able to do (I\_Mia\_21/08).

Mia made comment that the pace of ClassSim was too slow for her stage of learning, that she will be in a 'real' classroom in the subsequent year and the 'think time' available in ClassSim was unrealistic in terms of what she will be required to do next year (as a fully qualified teacher). Thus, it can be assumed that Mia's stage of learning did not coincide with what the virtual learning environment offered in terms of pre-service teacher training; rather, it was used as a tool for practising her knowledge and skills. Furthermore, Mia's comment regarding the unrealistic time available during the virtual lesson suggests that Mia felt prepared to take on the role of a teacher and the time constraints that come with it. Another interpretation of this may be that Mia acknowledged that in reality a teacher cannot pause, replay or rewrite a teaching moment and the game-like characteristics of the environment did not cater for this limitation.

Marc also made comment on ClassSim being more appropriate for first-year pre-service teachers. He suggested that ClassSim would be a good introduction to teaching as the pace is slower than a 'real' class and there is more 'think time'. He also suggested that the virtual learning environment was useful for him, in that it reminded him of the consequences of poorly thought-out decisions.

In a learning situation it [ClassSim] is good if say it was going to be used in a university class or something and especially for I guess beginning teachers. It gives you the time to think about what you're doing so when you do get a class you can do it more easily. It reminded me that if I make a decision, what's going to happen if I make the wrong choice for these kids. And are the class members suddenly going to go off the walls? (I\_Marc\_24/08)

Marc's suggestion that ClassSim is better suited to the needs of beginning pre-service teachers suggests that he feels adequately prepared to face the daily practicalities of a classroom. However, he did note that through the use of ClassSim he was reminded of the consequences of poorly-made decisions. Therefore, it appears as though engagement with the virtual learning environment had a worthwhile purpose for Marc.

Lauren made similar comments about the ClassSim being advantageous for first-year pre-service teachers, as opposed to third-year pre-service teachers. She explained that, for her, engaging with ClassSim as a first-year pre-service teacher would have helped her make valuable connections between her subject focusing on 'language and literacy' for primary aged children and a virtual practical example.

I think for me, it would have worked to have something like that fairly early, to be able to go 'okay here it is, now go away and do some study and research'. To say 'ah, that's that whole concept they talk about in the 'language and literature' component'. I think that would have worked for me (I\_Lauren\_22/08).

Thus, Lauren was able to make connections between her university coursework and the virtual learning environment. Although this connection was in retrospect to her previous studies, it suggests that ClassSim has the potential to aid other pre-service teachers in their connection between theories (university coursework) and practice (the virtual



learning environment). Overall, this comment indicates that many beginning pre-service teachers may find the ClassSim useful in the teacher training.

During an interview, Ross explained that engagement with ClassSim has the potential to be useful for all pre-service teachers. He suggested that engagement with ClassSim prior to their initial field experience, would give the first-year pre-service teachers insight into what they may face in ‘real’ classrooms and the confidence to know that they are capable of making appropriate decisions in a classroom. Further, Ross explained that engagement with ClassSim may also give third-year pre-service teachers confidence in their teaching skills via reflection.

It [ClassSim] might help to give someone the confidence to go ‘hey look I can make these decisions’, ‘I’ve learned enough to make them’ and maybe it might give you a reality check more than anything before you go on prac that ‘hey these are things might come up’ when you’re there. So it can prepare you before going out on prac and be useful in reflecting and just seeing your own confidence as a teacher. ‘Cause some teachers, on their third year prac just find they are not coping as a teacher they sometimes go, ‘I couldn’t be a teacher’ but then if they could come back to ClassSim and say ‘hey I can make that decision in a class now’. Just to see the change might be an advantage and move forward in their teaching career as well (I\_Ross\_22/08).

Ross’s comment regarding a number of third-year pre-service teachers who still lack the belief in their teaching abilities, may suggest that he himself may feel underprepared to enter the profession of teaching. However, he does note that through the use of ClassSim, these third-year pre-service teachers may gain confidence in their ability to make decisions. Thus, it appears that the virtual learning environment may have supported Ross in gaining confidence in his abilities to take on the role of a teacher.

During an interview Zoe explained that through her engagement with ClassSim she was reminded of the role of a teacher and the decisions she will be required to make. She explained that the past year of her university degree she had been focusing on assignments rather than on becoming a teacher, but her engagement with ClassSim reminded her that she is a pre-service teacher, not just a university student studying to become a teacher.

It reminds you that when you go into a classroom and you come across decisions, you realise ‘I’m going to affect these twenty kids’ lives by just this decision I’m going to make’ and it’s kind of scary. To actually have the practise and say it’s not too bad, that might happen, that kid will cry and that one will do this. You see, I totally forgot all that stuff because I have been doing assignments and stuff, not thinking about actual teaching. ClassSim sorta [*sic*] brings you back to reality (I\_Zoe\_20/08).

Zoe’s comment regarding her current focus as a university student suggests that she has been unable to build connections between her university coursework and her future career as a teacher. Thus, she sees these two things as separate entities. Through engagement with ClassSim, Zoe was reminded that she was studying to become a teacher and that there was a connection between her current studies and her future career. Thus, engagement with ClassSim served a worthwhile purpose for Zoe.

Overall, the majority of the third-year pre-service teachers suggested that engagement with ClassSim was an unnecessary tool for their final field experience and that the ClassSim was probably more suitable for first-year students.

### **Value to Learning**

Two of the third-year participants found different aspects of ClassSim to be advantageous in their learning and future careers as teachers.

During an interview Isabella noted that her engagement with ClassSim was useful in that it enabled her to see another teacher’s literacy program. She explained that as a beginning teacher she is open to the ideas of other teachers and that sometimes it is necessary to adapt good ideas to incorporate into her teaching. Overall, Isabella believed that her engagement with ClassSim enabled her access to a wealth of lesson planning ideas that she intended to adapt into her future career as a teacher.

Some of the teaching techniques that I found in there [the ClassSim] I think are really good. I looked at some of the ideas and I thought ‘wow they are really good’ and you can certainly adapt them to other grades as well, so from that point of view it was really good. It gave me great ideas for doing things. I thought that was the most valuable part of the whole experience. Just having a

peek at them, it's like when you have a look at other people's lesson plans you go 'I'm going to steal that that's great'. I really liked that bit of it, just for getting ideas for myself. It's good for professional development. Because you have to share ideas, you have to pitch [*sic*] other people's things, because what is the point in reinventing something that somebody else has already invented. So yeah, I really enjoyed just looking at the different ideas in there (I\_Isabella\_20/08).

While the purpose of ClassSim was not intended to guide pre-service teachers in this way, it appears that Isabella was able to look beyond this and find useful information to support her in her career as a teacher.

Mia made comment on her lack of experience with a kindergarten class. She explained that she was assigned a kindergarten class for her initial field experience; however her supervising teacher only allowed her to observe the class without interacting with them.

The only kindergarten class I had was in first year, first semester. So I did a lot of sitting back and watching, and also the teaching style of the teacher that I was given, I just didn't appreciate at all, she was way too strict on them. So yeah that was a bit of a negative experience (I\_Mia\_21/08).

Mia described her exposure to quite a didactic style of teaching; through both interaction with the students and her own pre-service supervision. Through her engagement with ClassSim, Mia was able to experience the role of a kindergarten teacher, with the power to make decisions, as opposed to her initial field experience. Another finding that arose was Mia's assessment of her field experience teacher's style of teaching. She noted that her field experience teacher took a rather authoritarian role, which was in contrast to Mia's developing style of teaching.

Overall, the findings suggest that engagement with ClassSim served a worthwhile purpose for the learning of some participants as it gave them access to new lesson planning ideas and enabled them to experience teaching in a kindergarten class for the first time.

## Timing of Engagement

Three of the third-year pre-service teacher participants claimed that their engagement with ClassSim was a useful learning experience at this stage of their degree. However one participant claimed that her stage of learning was too advanced and, for her, ClassSim was not seen as a useful learning tool.

During an interview, Lauren explained that she felt competent in her ability to plan for a learning experience, however after her engagement with ClassSim, she was reminded that there are more levels to planning, including planning the transitions between lessons and planning for early finishers.

I guess I knew how to plan and all that. But it made me think, when I am in a classroom, ‘what am I going to do next?’ I felt like I wasn’t even prepared for the fill-in bits. I didn’t know what I should do to get from this part of the day to this part. Oh, and if this kid finished early and you haven’t got anything planned, what are you going to do with them? Really what am I going to do? I find from the learning side I’m very prepared for how should I assist the learners, cater for different learning needs all that kind of thing, but that other fill-in stuff I feel unprepared (I\_Lauren\_22/08).

Lauren claimed that before engaging with ClassSim she felt prepared to plan for the learning experiences of her students. However, it appears as though engagement with ClassSim both coincided with Lauren’s stage of learning and motivated her ‘readiness’ to learn about the planning of transitions and extension activities.

Zoe explained that she had been in many teaching situations but it was through her engagement with ClassSim, in particular the ‘Student Updates’, that she better understood how her decisions could affect her students on an emotional level.

It [ClassSim’s ‘student updates’] made me consider how my choices would affect kids emotionally. I have been in lots of teaching situations but I haven’t really considered that. It just made me really consider what decisions I make and how it affects the kids (I\_Zoe\_20/08).

Zoe's comment suggests that she came to a better understanding of the holistic nature of teaching children. That the role of a teacher does not only involve teaching content, it also involves considering the emotional needs of her students. Thus, it appears that through her engagement with ClassSim she was encouraged to broaden her understanding of the role of a teacher and the needs of students.

Prior to her field experience Isabella visited her field experience class to gain knowledge about the class and to build a rapport with the students. After engaging with ClassSim and visiting her field experience class Isabella noted in an interview that her field experience class has similar students to those found in ClassSim. She also expressed concern about one particular student who seemed withdrawn and emotional. She suggested that he may have similar family problems as Luke (from the ClassSim, whose father is terminally ill).

My prac teacher has got a lot of the Harley and Gavin's [*sic*] in her class. There are not a lot of Rebecca's [*sic*], maybe one or two. There are not a lot of cultural differences in the class. And there is one boy in particular who is really emotional; he'll cry because a girl sits next to him. I have to speak to the class teacher to see what's going on with him to help me handle the situation. He might have some problems like Luke (I\_Isabella\_20/08).

Isabella's engagement with ClassSim may have stimulated her interest about the welfare of a student in her field experience class. The findings also indicate that through her engagement with ClassSim Isabella had been alerted to the range of needs that can be apparent within a classroom, even though this was not evident in the field experience she had been previously exposed to. Thus, it can be assumed that engagement with ClassSim gave Isabella a frame to consider the diversity of classrooms and motivated her to learn about the background of a student, thereby gaining insight into how she can best cater for his needs.

During an interview Marie was asked if the ClassSim was useful to her learning. She responded by explaining that she believed ClassSim would be useful, had she not been at her current stage of learning. She suggested that she had surpassed the knowledge contained in ClassSim, and perhaps it would be better suited to the first-year pre-service teachers.

Really, there are some good things in it [ClassSim], but I didn't find anything in there that I didn't already know. I think I may just be on a different stage of learning and not need it. But it'll be good for people in the beginning of their degree (I\_Marie\_20/08).

Marie's assumptions regarding her stage of learning may indicate that she assumed she had mastered the required skills and knowledge of her pre-service teacher education course. At this particular stage of her development, Marie did not perceive engagement with ClassSim as being useful, as it did not encourage further learning. However, Marie's affirmation of the information presented in ClassSim illustrates that she believes ClassSim holds vital information for pre-service teacher education, even though it is not relevant to her current needs.

Overall, many of the third-year pre-service teachers indicated that engagement with ClassSim may have encouraged them to broaden their understandings in particular areas.

## **Orientation**

An adult learner is task or problem-orientated in their learning. There are two aspects of 'Orientation' identified in the third year participant data. These included relevant scenarios and the need for new knowledge.

### **Relevant Scenarios**

The third-year pre-service teachers were able to make connections between what they were learning and how it applies to their future career as a teacher (as a task they need to perform or as a problem that needs to be solved). Three of the seven third-year pre-service teachers made comment that ClassSim was a worthwhile learning experience as it presented relevant examples. In contrast, four of the third-year pre-service teachers found a number of discrepancies between real-life and ClassSim, and thus questioned the relevance of the program to their learning.

During an interview Mia explained that she was assigned a kindergarten class for her first-year field experience. After engaging with ClassSim she was able to point out a number of similarities between her first-year field experience class and the virtual learning environment.

I had a kindy [*sic*] as my prac in my first year and I think I noticed more similarities to that with just like how they are going to transition things and how they're going to build up the lessons and that. I felt the structure of it [ClassSim] was very much like a normal kindy [*sic*] class I've seen. With two classes showing similar things, I know how I will probably do it (I\_Mia\_21/08).

Mia explained that the most noticeable likeness between the two classes was the structure of the 'literacy block' and the transitions between lessons. These similarities appear to aid Mia's understanding of a kindergarten 'literacy block'.

In her 'Thinking Space' Isabella commented on a similar teaching resource that she has seen during her field experiences. She explained that she had seen the use of a 'days of the week' chart in almost all of the kindergarten, year one and year two classes she had entered.

The Days of the Week chart is an example of a technique that I have seen in almost every Early Stage 1, Stage 1 classroom that I have entered. I have seen the use of elephants quite often along with other examples of trains, balloons and other animals; however the elephant is the most common. In the classroom examples that I have seen, the elephants have been displayed on the door so that it is one of the first things that the children see when they enter the classroom for the day (TS\_Isabella\_30/08).

Isabella's comment regarding the use of this resource indicates that she has come to value this teaching aid as effective, largely because of its common use. Thus engagement with ClassSim and her other field experiences have helped her to develop knowledge about teaching Early Stage One and Stage One classes.

Zoe explained that she had never been in a kindergarten class before engaging with ClassSim and as a result found the experience valuable. She was able to find similarities between a girl she is currently working with on field experience and the work samples

provided in ClassSim. She suggested that the standard of writing produced by this girl was very similar to that of Gavin (a child in ClassSim).

I had never been in a kindergarten classroom so it's good to see what their work might look like. Just really made me think about the girl I'm working with when I'm on prac, her writing is exactly the same. She's a bit like Gavin in her writing; she can do the first few and then give up. So it was good to actually see, to compare to what you see in the classroom and possibly why she gives up (I\_Zoe\_20/08).

Zoe's lack of experience in a kindergarten class suggests that she found her engagement with ClassSim to be valuable as she was able to see what kindergarten students are capable of. On seeing their work samples Zoe was able to highlight similarities to the work produced by a field experience student. She noted the child's ability to do the task and her tendency to give up. Furthermore, Zoe suggested that ClassSim gave her insight as to why her field experience student does not finish her assigned work. Thus, through the use of ClassSim's support material Zoe was able to use her newfound understanding to better understand the needs of a student that she was teaching.

During his final interview Ross was asked if the virtual learning environment was a good representation of what he had experienced on his field experiences. He explained that the scenarios presented in ClassSim were similar to what he had experienced but some of the student reactions were a little different. He suggested that the ClassSim did not depict the complex nature of student reactions.

I guess all the scenarios are reflections of what I've seen in classroom. They're valid scenarios, they definitely are, you've got kids like your ESL student, your child that goes off, you've got your daydreamer, you've certainly captured a good cross section of what you would see in a classroom. The things that aren't captured in there [ClassSim] are children that can't concentrate on their own, ah behaviour too, if someone goes off you tend to lose another six children with that child and it [ClassSim] doesn't really cater to that option so you can't really talk about what you're doing with the rest of the class while that's happening (I\_Ross\_16/11).

While Ross could identify some similarities between ClassSim and what he had experienced, he suggested that ClassSim did not adequately cater for the complex nature of student reactions on the other class members.



Mia commented on the amount of 'Student Updates' being too many in number and too much in terms of information provided. She explained that in a 'real' classroom she would not have a similar amount of time to think about all the consequences of each of her decisions.

As it went on I just thought there was way too much to take in, each update of mine, I'd barely done one minute and I've already got a new update, I was just like, I'm never going to get through a day if I had that much, I felt like I wasn't moving quickly enough from what I'd be in the class. I don't usually have that much time to sit; I've got to just make a decision go with (I\_Mia\_21/08).

For Mia, the virtual learning environment provided her with too much support information to successfully complete a lesson, thus she did not find the support material relevant to her needs. She also made note that she would not have the amount of think time when in a 'real' classroom and thus saw another irrelevant aspect of ClassSim.

Isabella made similar comments regarding the support information provided. She however suggested that in a 'real' classroom a teacher will not only focus on the needs of one child at a time like in ClassSim; rather a teacher will take a whole class focus.

But also I know you can check on what's happening with the other children, but in a real life situation if you could see all the other children you may even make a different decision, depending, you can't actually see them all, you are focusing on one child at one time in the Sim and I know you do eventually check what's happening with the other children as a result of your decision. But had you have the whole class in front of you; you may even decide to do something different (I\_Isabella\_20/08).

Although Isabella commented on a user's ability to access a whole class update, she suggested that this is quite different from having a whole class of students in front of you. This suggests that Isabella's main concern is the lack of personal connection with the students, rather than a problem with the available information within the ClassSim.

Marc also found it difficult to relate a computer program to real-life students. He explained that he stopped reading the 'Student Updates' as they were all fairly similar, but as major events occurred he would access them. When he began to access them

again he was reminded that the ClassSim students were representations of ‘real’ students, complete with emotions.

I kept looking when the sim offered the student updates at the bottom, towards the end after I’d done it for about an hour I stopped reading them because they all said the same kind of thing. When it’s a major change about one or two students you really know that there was a big change so I read them then most of it was about Bibi or Gavin or Harley. Yeah about how they’re feeling but because it’s a computer thing you really don’t take that into consideration that they’re really feeling something but that lets you know what you’re doing and how it affects them (I\_Marc\_24/08).

It appears as though Marc had trouble relating ‘real’ students with the virtual students due to the fact that ClassSim was a computer program. This is a limitation of ClassSim.

Overall, the findings suggest that some of the third year pre-service teachers found ClassSim to be a worthwhile learning experience as it enabled them to experience a kindergarten class for the first time, reinforced the effectiveness of a teaching technique and aided understanding about the needs of students. However, some third year pre-service teachers did not find ClassSim to be relevant to their current learning needs.

### **Need for New Knowledge**

A key aspect of ‘Orientation’ is the adult learners’ identification of gaps they have in their knowledge and/or skill base. As the third-year pre-service teachers are in their final year of pre-service teacher training, it is important that they are able to identify areas of their learning that need further development before they enter their careers as teachers. The findings indicate that through their engagement with ClassSim, three of the seven pre-service teachers were able to identify areas of their learning that required further development.

During an interview Mia explained that her engagement with ClassSim aided in her understanding about the needs of a student in her field experience class. She explained that the field experience student was having difficulty in literacy comprehension. Mia

found that this child's level of literacy development closely resembled that of Bibi (an ESL student in ClassSim).

In the class I will have for my final prac, there is a little girl who was home schooled but she wasn't taught properly. She is in year two and she has the literacy understanding of a kindergarten student. The school won't put her down any lower than year two because that's where she's supposed to be. So she hates school 'cause everything's hard. So using ClassSim has helped me sort of really understand the different ways to actually get her to be a part of the class. With Bibi having similar literacy problems, I sort of know how I can approach her (I\_Mia\_21/08).

It appears as though Mia utilised the virtual learning environment to gain insight into the needs of a student from her field experience class and gain ideas on how to approach the situation. This suggests that while Mia was on field experience she was able to draw upon her engagement with ClassSim to better understand an area of teaching unfamiliar to her. During the same interview Mia also commented that there was too much information in the support material; however she utilised the student updates and summary material regarding Bibi (O\_Mia\_18/08) to better understand the needs of ESL learners and learners with difficulty in literacy comprehension.

When asked what was the most useful aspect of engaging with ClassSim Marc responded by explaining his lack of knowledge and experience in working with ESL children. He explained that ClassSim was a wakeup call in that he was faced with the prospect that there may be children in his class that do not speak any English.

I don't have any experience working with children with a second language in any capacity even when I was at school. It was pretty much straight Anglo Saxon and there might have been the odd child who had a foreign last name though. I think for me that was a really big highlight. You know how do I deal with this? If I've got a child in the class that can't speak the language or parents can't speak the language how do I make it relevant for them? (I\_Marc\_13/11)

Marc's comments may indicate that this was the first time he had considered the prospect of ESL children in his class.

Isabella also made comment on her lack of knowledge regarding ESL students. In her 'Thinking Space' Isabella noted the suggestion of further reading in order to gather more information.

There is a document that I am aware of called the ESL, English as a Second Language document, and I would read this to gain further knowledge about having a child like Bibi in my class (TS\_Isabella\_30/08).

This suggests that Isabella's engagement with the virtual learning environment, in particular her interaction with Bibi (the ESL child), prompted her to research the needs of ESL students. This finding was reinforced in her field experience reflections.

I think that the Class Simulation is a great idea to give an insight into the challenges that teachers face on a daily basis and how a classroom is run. The simulation really prompted my thinking as to what I would do if I were faced with a child who couldn't speak a lot of English or a child that has difficulty following a sequence of instructions. I believe that I will be more prepared when going into a classroom now then what I would have before I completed the simulation as I now understand that I may well be faced with children who show similar characteristics to those of Bibi, Gavin and Harley (FER\_Isabella\_11/11).

Isabella stated that she believes that she feels more prepared to enter a classroom as a result of her engagement with ClassSim.

## **Motivation**

For the purpose of this inquiry the principle of 'Motivation' is discussed according to four main factors. These include success, volition, value, and enjoyment in relation to the third-year pre-service teachers' engagement with ClassSim.

### **Success**

Two of the seven third-year pre-service teachers were able to articulate a sense of achievement though their engagement with ClassSim. This came from a sense of job

satisfaction when they accessed the ‘Student Updates’ to gauge their success and in their creation of a two-hour ‘literacy block’.

Isabella commented on the ‘Student Update’ feature during an interview, suggesting that through her use of this tool she was able to gauge how well the students were progressing.

I used the student updates all the time because I always wanted to know what was going on with the rest of the class so I always used the student updates (I\_Isabella\_20/08).

Thus it appears as through the instant feedback of the ‘Student Updates’ Isabella gained the information she needed to proceed through the decision making opportunities presented within the virtual learning environment.

In her ‘Thinking Space’ Lauren reflected on the success of one of her lessons. She suggested that the reason for the successful lesson was the use of concrete materials and the high level of engagement throughout the lesson.

The reason why I believe this activity was performed well by all targeted students is that they were engaged in the activity and that it used concrete materials to complete the task. It also provided the students with some independence within their work (TS\_Lauren\_19/08).

Lauren’s comment regarding the high level of engagement of the target students suggests that she utilised the ‘Student Updates’ to gauge their learning. Thus, it appears as though Lauren used the ‘Student Updates’ to determine her success as a teacher and the success of the lesson. Her comment concerning the use of concrete materials may indicate her understanding of child development and learning. This knowledge may have come from her university studies, which suggests Lauren was able to make connection between her university coursework and the practicalities of a classroom. This knowledge may also have come from her previous field experiences, textbook readings, and conversations with supervising teachers and other pre-service teachers.

Mia noted the success of one of her lessons in her ‘Thinking Space’. She explained that the sequence of lessons she selected for her ‘literacy block’ were conducive to the learning needs of the children in her virtual class.

The sequencing activity with the Days of the Week proves to be a good choice as it meets the needs of all students and their behaviour at this point is maintained at a medium level (TS\_Mia\_18/08).

Mia’s comment on the needs and behaviour of the students suggests that she accessed the ‘Student Updates’ to keep track of their engagement levels. Thus it appears that Mia used the ‘Student Updates’ to gauge the success of her teaching and the students’ learning.

Zoe explained that she did not feel that she was successful in the implementation of a lesson. It appears that this was due to the fact that the ‘Student Updates’ presented Rebecca (one of the higher achieving students in ClassSim) to be disengaged and bored.

I don’t think I catered for the children adequately. ClassSim just illustrated how hard it is to cater for everyone. Especially with that smart kid her pictures always seem to be bored, not stimulated enough. You’ve got to make sure you go on pushing her without being too hard on her, frustrating her (I\_Zoe\_20/08).

It appears as though Zoe utilised the ‘Student Updates’ to measure her success in terms of her teaching decisions and the engagement of her students. She also made comment on how to best cater for Rebecca’s needs and the difficulty in catering for each of the individual students. Thus it seems that Zoe has some understanding on how to cater for the needs of her students, but is still developing a range of effective strategies that can aid her teaching in this manner.

Lauren explained that she found it difficult to make successful choices whilst engaging with ClassSim, as the decision-making opportunities were restricted to two or three options.

Sometimes the two choices are not what you would choose. I thought there was maybe a better way of doing it. I used the Thinking Space whenever a decision

came up. It was good to justify what I thought and maybe suggest a better way of doing it, cause the options weren't always the best (I\_Lauren\_22/08).

Lauren's comment on the limited number of options available suggests that she was unable to find sustained success in the decisions she was making. To overcome this, Lauren utilised her 'Thinking Space' to suggest alternative approaches.

The findings indicate that the use of the 'Student Updates' allowed some of the third-year pre-service teachers to gauge the success of their teaching decisions. Also some of the third-year pre-service teachers felt affirmed by the choice they made in the design of their 'literacy block'. The use of the 'Thinking Space' also allowed one participant to suggest options that were different from those offered by ClassSim.

### **Volition**

Throughout the running time of the virtual learning environment, the users were presented with a number of decision-making opportunities. The ability to make decisions is a key motivator in adult learning and the findings reveal that two of the seven third-year pre-service teachers claimed this control was a motivating factor of their use. However, the findings also suggest that the number of options available was too limiting for the third-year pre-service teachers to feel a sense of ownership. Four of the seven third-year participants made comment on this.

During an interview Zoe explained that she found her engagement with ClassSim to be a useful experience. She explained that her previous field experience teachers had limited the amount of control she had in the organisation of the class.

In the ClassSim it actually gives you the opportunity to see what you would do if this was your class and I've never had that before, it was always been follow what the teacher had done to keep them in the routine. It made me think (I\_Zoe\_20/08).

Zoe claimed that her previous field experiences were quite restrictive as there were few opportunities to develop her own teaching style and sequence of lessons. Her

engagement with ClassSim provided her with the opportunity to assume ‘control’ over a class for the first time. In Zoe’s case the opportunity to ‘control’ a virtual class throughout the running time of ClassSim appeared to motivate her use of the program.

Mia made similar comments regarding her previous field experiences. Although Mia explained that she was able to use her own teaching style in her previous field experiences, she was restricted on the sequence of lessons she followed. Her experience with ClassSim gave her the power to control the organisation of her ‘literacy block’.

I guess now after prac looking back I’d go after actually having to decide what are you going to do first in the morning because in other pracs [*sic*] you never get that freedom but on your third year prac you get to go ‘what am I going to do’, ‘what should I start with’, ‘it’s probably then better to...’ (I\_Mia\_13/11)

Mia’s suggested that her approaching third field experience will enable her to assume more control than previous experiences. Therefore the ability to sequence a ‘literacy block’ may have motivated Mia’s decision to use ClassSim.

Lauren explained that there were not enough options available at the decision-making points. She explained that she had to utilise her ‘Thinking Space’ to note her preferred choice as opposed to the options given.

I used my Thinking Space to discuss things I didn’t like. The options were actually okay but I would have liked other options. Yeah, that is something I would have liked. More options (I\_Lauren\_16/11).

Like Mia and Zoe, Lauren also commented on the restrictiveness of her previous field experiences. Evidence of Lauren’s use of ClassSim’s ‘Thinking Space’ to suggest alternative options are shown below.

RE: Pizza Friday

Harley should be reminded to wait for his turn to answer, however the teacher should also acknowledge his answer ... e.g. On Friday’s Mathew and Harley have pizza for tea (TS\_Lauren\_19/08).

RE: Favourite line



I don't think either of those options are suitable. If you tell Gavin he can hop, it could cause a lot of commotion, and if you tell him no it could cause him to be definite. I believe the best solution would be to tell him that at the present time we are reading a poem and that we might do the actions later (TS\_Lauren\_19/08).

While Lauren used the 'Thinking Space' to fulfil her need to explore more options, her comments could indicate that she would have been more motivated if the software had offered these options.

During his interview Ross also explained that he wanted more options available at the decision-making points throughout the virtual learning environment. He said that he knew he had to pick one of the options, often choosing one that was more representative of his position.

I had to do one thing or the other it was like, 'well you're going to have to pick one of the options', so I chose the one I'd more likely do. But there was one I thing I wrote down in my thinking space where I just went 'I'd choose neither' (I\_Ross\_22/08).

Like Lauren, Ross also utilised his 'Thinking Space' to suggest alternative decisions and to state his need for more options.

I don't like the options. They are too extreme. I think there should be a middle ground between ignoring Gavin and reprimanding him. Something along the lines of, 'Come on Gavin, we are going to have a just super day' or words to that general effect (TS\_Ross\_21/08).

Ross's 'Thinking Space' entries indicate that he found the options to be too restrictive. Although Ross was able to suggest an alternative option in his 'Thinking Space' he still did not have enough control within the virtual environment to feel that the decision making opportunities on offer were a valuable learning experience that motivated him to learn more.

Marc also found the options available in ClassSim too limiting. He explained that he was frustrated that he could not utilise his knowledge and skills to make alternative decisions with his virtual class.

Yeah I think it was a valuable tool, I get frustrated because it locks me in, so yeah, I guess that's the big frustration because it makes me make a choice that I might not have necessarily made. It is like, 'give me another option I don't like either of those' (I\_Marc\_13/11).

Marie was another participant who suggested that she found the program restrictive and frustrating. She identified one particular decision point that caused her annoyance.

The seating options you only have two options. I found that very frustrating. You might want to have pairs or singles, I found that a little bit restrictive because it's a really important thing and it really impacts on the way different students learn so and if the whole class doesn't want to sit in a horseshoe, maybe one child wants to sit on their own (I\_Marie\_20/08).

Marie suggested that only having two options for the seating arrangement may be detrimental to a number of students' learning needs. She identified this decision as extremely important as it can affect the learning of a student. This may indicate Marie has a good understanding of the different learning styles and their preferred learning environment.

Overall, the findings indicate that two of the third-year pre-service teachers found the number of decision-making opportunities motivated them to keep engaged with ClassSim. However the majority of the third-year pre-service teacher participants found the options offered by the virtual learning environment to be too limiting and this was a source of frustration.

### **Value**

The findings of this inquiry suggest that two of the third-year pre-service teacher participants found ClassSim to be a valuable tool in practising their teaching techniques and as a tool to make valuable connections between theory and practice. The findings also indicate that some of the third-year participants did not find the virtual learning environment to be a valuable tool in their pre-service teacher training. In addition a number of the third-year pre-service teachers discussed the importance of reflection and

discussion with people more experienced than themselves. Thus, the third-year pre-service teachers suggested that in order for them to better understand their learning and gain more value from their engagement with ClassSim, they should reflect upon their actions/thoughts and then discuss this process with people who are experts in the area. Three third-year teachers made comments of this nature.

Lauren found her engagement with ClassSim to be valuable in that it not only enabled her to make her own decisions in the running of her own class without adversely affecting any ‘real’ children, it also helped her make connections between her learning in university lectures and what it may look like in a class.

It just helps to see what you’re being taught in the lectures. It also gives you the chance to have a look and make your own decisions and be able to see the consequences without it directly affecting the kids in the classroom (I\_Lauren\_22/08).

As previously mentioned, Lauren had not experienced the freedom to design her own ‘literacy block’ during her previous field experiences. Therefore Lauren found her engagement useful in terms of gaining practice in sequencing a ‘literacy block’. Furthermore, Lauren claimed that she was able to draw upon the knowledge she gained in lectures whilst interacting with ClassSim, thereby building connections between university knowledge and what this may look like in a classroom.

Ross found the virtual learning environment to be a useful tool. He suggested however that its usefulness may have been increased had he had access to it earlier in his degree.

I thought it was a great idea. I also thought it came too late in terms of our degree. It would have been nice to have that perhaps a little bit earlier. I can understand the process you’ve got to follow, but it would have been nice to have it earlier. To see the complete picture almost, to have a go at the complete picture and then go back and have lectures and tutorials that actually build on the simulation rather than the reverse (I\_Ross\_16/11).

Ross explained that ClassSim could have been introduced as an example of a classroom experience (the whole picture), and then using university lectures and tutorials to build upon smaller aspects to increase knowledge. Thus, it appears that although Ross could

not gain a lot of value from ClassSim, he did acknowledge its value to pre-service teachers in an earlier stage of their degree.

Lauren explained that ClassSim was the first time she was confronted with an ESL student and that engagement with ClassSim gave her an idea of what it might be like to have an ESL student in her class.

I've kind of got a picture of what this might be like in a classroom and then draw back on what I've learned in the ClassSim. About Bibi, I guess more just being, it's just an awareness thing. Like tapping into her culture in some way shape or form and then being able to bring that into the classroom, and then I guess just bridging the gap for her. It's not going to be acceptable for her just to stay dependant of Mary; she won't learn and neither will Mary (I\_Lauren\_16/11).

Through her engagement with Bibi and the use of the support materials regarding Bibi, Lauren came to a better understanding about how to best integrate an ESL student into her class and how to allow for her needs, without compromising the needs of others. Therefore it appears as though Lauren found her engagement with ClassSim to be a valuable experience as she was able to gain insight into the inclusion of ESL students.

Marc suggested that although he found his engagement with ClassSim to be useful, he explained that in order to get the most out of the experience the user should reflect upon each issue in detail.

I thought it was good in some ways but in some ways. But when I was thinking by myself I'd prefer to make a better decision through it all. So you really need to use that thinking space (I\_Marc\_13/11).

This was a common finding of the third-year pre-service teachers, that there were not enough options available at each decision point (see 'volition'). Marc suggested the use of the 'Thinking Space' to reflect upon the decisions and perhaps suggest alternative options. Thus, although Marc found ClassSim to be a valuable experience, it should not be used as a learning tool in isolation. The findings also indicate that Marc understood the importance of reflection to increase understanding and grow as a professional.

During an interview, Isabella suggested a way in which the third-year pre-service teachers' engagement with ClassSim could be altered. Instead of making engagement with ClassSim an individual task, she suggested to have each user engage with one scenario and then discuss the situation (the consequence of the decisions made and possible alternatives to the decision).

I think it would be a really good tool if everybody did maybe one scenario but then talked about what happened to you and why you think it happened and what else might happen in a classroom (I\_Isabella\_20/08).

This suggests that Isabella's learning is strongly influenced by reflection, not only her personal reflection, but also the reflection of others. Therefore it is suggested that in order for pre-service teachers like Isabella to find the use of ClassSim as a worthwhile learning experience, reflection should occur in open discussion. Open discussion would allow users to articulate their decision-making processes thereby broadening her understanding of an issue/event and her own learning.

Lauren had a similar view on how ClassSim could be used with third-year pre-service teachers. Lauren explained that for her stage of development, the ClassSim should not be used as a standalone learning tool. She suggested that not only should they discuss the scenarios with other third-year pre-service teachers, but to also arrange to have an experienced teacher to discuss the issue with explicit connections to real-life contexts, thereby broadening the learning experience.

But it's good food-for-thought because it does set up the scenario which is what you need to look at and you do need to discuss. It would be good to discuss and even discuss it with some people with some teaching experience because they'd be able to say 'yeah that might work' or 'I've seen that happen' or 'I had a child in my class that did this'. So I think it's a really valuable tool but not to be used on its own for us (I\_Lauren\_20/08).

Lauren's comments suggest that she viewed ClassSim as a tool to promote discussion with people seen to be expert in the field of teaching, thus increasing her understanding of the scenarios presented and enhance her learning. However, it is important to note that the summary material available throughout ClassSim have both web links and book references to the views of experienced practitioners. Thus it appears that Lauren

neglected to access the summary material and thus failed to notice the expert information available throughout the virtual learning environment.

Marie also commented on ClassSim being used as a tool to promote discussion. She suggested that after each user has selected an option, reflected upon why they have chosen it with consideration to how the students reacted; they should discuss the scenarios as a group with an experienced teacher.

But it's probably something you can't fit into the actual sim but certainly should be discussed with more experienced people. Just say, once everybody's chosen their table set up and justified why they're having their table set up, have a look at how the students react to it, and all that sort of thing. Then I think it would be great to get people who have had more experience in the classroom and really talk about different options and things that work and don't work and stuff like that (I\_Marie\_20/08).

Marie's suggestion indicates that she also did not utilise the summary material, which has comments regarding the different scenarios from the point-of-view of an experience teacher. Furthermore, it appears as though Marie understands the importance of reflection and finds discussion with people more experienced than herself an important tool in her learning.

Overall, it appears that the majority of third-year pre-service teachers found some value in their engagement with ClassSim and suggested ways in which their engagement would be a more valuable experience.

### **Enjoyment**

The findings indicate that there were mixed feelings in regard to the third-year pre-service teachers' enjoyment when engaging with ClassSim. Some third-year pre-service teachers suggested that the ClassSim resembled a game and as such was a safe environment in which they could experiment with decision-making opportunities. However other third-year pre-service teachers suggested that this game-like resemblance created feelings that there were only 'right' and 'wrong'

answers/decisions, thus detracting from their enjoyment. Another aspect of ClassSim, which the third-year pre-service teachers identified as affecting their enjoyment, was the copious amount of information presented. They suggested that this was a downfall in the program.

During an interview Zoe made comment on the ClassSim's similarity to a game. She explained that she felt comfortable in this setting to click on any and all of the links, as she was able to return to her previous page.

I went to go back and see what the other choices lead to as well. Whenever there was anything to click on I just clicked and read and then went back (I\_Zoe\_20/08).

Zoe's comment on the ease of clicking 'back' suggests that she found the program easy to navigate. Further, this ease of navigation enabled her to safely explore the virtual environment's decision-making opportunities. The findings also indicate that the ability to see where the alternative choices led was useful in her learning.

Ross explained that he found ClassSim to be a safe environment in which he can experiment with his decision-making opportunities. He explained that he was free to make mistakes without the consequences affecting 'real' students.

Well it gives you the opportunity of being the class teacher without actually being in the real world where you can stuff up decisions. You can do reflections, you can try things without hurting anybody, not that we physically hurt but hopeful not mentally (I\_Ross\_22/08).

Ross selected options he would not usually choose in a real-world setting, thus he was able to better understand some of the probable consequences of these decisions. This indicates that Ross may have enjoyed his engagement with ClassSim due to the safety of the environment.

Isabella explained that she did not find her engagement with ClassSim to be enjoyable. She explained that the decision-making options represented a 'right' and a 'wrong'

answer. She continued to explain that she felt as though the purpose of the ‘game’ was to guess what the designers believed to be the ‘right’ answer.

I feel like I was playing a game when I play it because there still seems to be a right and wrong answer and I don’t think that’s right ... I actually went back and did the whole thing again and used the student updates again to see what would happen, but I felt like I was playing a game, to see what you thought was the right decision (I\_Isabella\_12/11).

Isabella’s belief that there was a ‘right’ or ‘wrong’ answer restricted her decision-making and detracted from her enjoyment. As she believed there to be a ‘right’ answer, Isabella may have associated her engagement with ClassSim with an exam or test of her competencies, thus decreasing her enjoyment.

Mia believed there was too much information provided within the virtual environment’s scenarios and support material. She explained that the copious amount of information needed to successfully engage with the virtual learning environment was not conducive to computer-based reading.

The only problem was to know about them meant reading lots of information which is a bit tedious for using a computer program so we usually want to be a bit more hands on rather than sitting there reading. But the information was good ... If it was a real person you can get to know the ins and outs but if it’s a computer person it’s very hard. All you’ve got is writing to understand who they are (I\_Mia\_13/11).

Although Mia agreed that the information was useful and of good quality, she did suggest it was difficult to read on a computer screen and then associate this information with the characters of a virtual class. Mia compared this to meeting ‘real’ people, where the protagonist can use all of their senses to better understand a person and develop a relationship with them; whereas in ClassSim the user is only presented with written information to understand who each child is and what their needs are. Thus, Mia found it difficult to enjoy her use of ClassSim largely due to the amount of text required to be read.



Overall, the findings suggest that many of the third-year pre-service teachers found ClassSim to resemble a game. This resulted in mixed feelings. Some participants suggested that the game aspect of ClassSim helped them to feel safe in their decision-making. Other participants suggested that this game-like resemblance created the impression that there were only 'right' and 'wrong' answers/decisions, thus detracting from their enjoyment. Furthermore, the amount of information presented was also identified as a factor detracting from user enjoyment.

## **Experience**

'Experience' is discussed according to what the third-year pre-service teachers base their decisions upon while engaging with ClassSim (previous knowledge and experience) and reflections on their experience.

### **Previous Knowledge and Experience**

The first aspect of 'Experience' to be discussed relates to the third-year pre-service teachers' ability to draw upon their previous experiences and knowledge when engaged in a learning situation. All of the third-year pre-service teacher participants were able to identify when and where they drew their knowledge and experience from when faced with a decision-making opportunity within the virtual learning environment.

Within the virtual learning environment the first decision a user comes across is concerned with how they would arrange the furniture in their classroom. In her 'Thinking Space' Marie suggested that she would utilise a table group formation to cater for the needs of the students with learning difficulties. This was something she had observed during her time at the demonstration school in the first year of her degree.

In my opinion, I would use the table groups idea to set up the classroom as I could group the students so that children who have learning difficulties can be paired with someone who excels. I have seen an example of this at the demonstration school where a year five student with learning difficulties was sat next to a student who was a very confident learner. Their table was sat next to

the teacher's desk so that he could also monitor both of their learning (TS\_Marie\_30/08).

Marie suggested the use of table groups in her virtual classroom to support the idea of peer tutoring. This was an idea she adapted from a school she visited two years prior. This suggests that Marie found the strategy to be effective as she was able to recall its use and suggest its implementation two years later.

Marie continued her rationale for the use of table groups in her 'Thinking Space'. She suggested that table groups would also be effective in catering for the needs of ESL children.

Although the horseshoe idea is a good idea for whole class activities I think that the table groups would work more effectively in a classroom environment for students such as Bibi who is a non-speaking student.

I have seen an example of a Non English Speaking student in a kindergarten class at one of my prac schools. The teacher used the table-grouping scenario and sat the student with English speaking students to give the child a role model. There was more than one child in this class that could not speak English so the teacher spread these children out so that they were exposed to the English language on a daily basis. The table grouping allowed the non English-speaking students to watch, communicate and get involved with small group activities (TS\_Marie\_30/08).

Marie explained that one of her previous field experience teachers implemented this strategy to immerse ESL children in an environment of English speaking children thus exposing them to the English language on a daily basis. Marie believes that this strategy would be beneficial for Bibi as she would be able to observe and engage in discussion by means of student-modelled behaviour. Therefore Marie was able to draw upon previous practical examples of integrating ESL learners in her virtual classroom.

While engaging with ClassSim Zoe reflected upon a number of considerations when deciding upon her table formation. She ultimately made her decision based upon her field experience.

Does the group set-up allow for floor space for the children to sit?

In my experience with my prac classes I have been required to teach in both group table and horseshoe set-ups. I found that with the group set-up, that the

children worked more effectively. The group set-up also allowed easier access to students rather than having to walk around the entire shoe to get to them ... this just helped to keep things flowing (TS\_Zoe\_18/08).

Zoe explained that she had experience teaching in both a horseshoe formation and table groups, and from her experience group tables had been the most effective in terms of ease of access and work efficiency. This may also suggest that Zoe's philosophy of teaching may involve the frequent use of group work during class activities.

During his use of ClassSim Ross reflected upon the virtual teacher's comment regarding 'sitting up straight, ready to learn'. He explained that instead of asking one student to explain how to appear ready to learn, the virtual teacher should have made a simple statement explaining the desired behaviour and reinforce this behaviour with positive reinforcement.

I would not ask the children to "show me how to sit if they want to learn". School is for learning so students shouldn't have to make a choice whether or not they want to learn. I would say, "Rebecca I really like the way that you're sitting up straight, I can see that you are ready to start the day. I am going to look for other people who I can see are ready start the day". In my experience from my school visits, most, if not all of the students will sit up straight to prove that they are ready. Rather than asking Rebecca to explain how it is done I would reward her with a chance to choose a morning book which will be read to the class. I would then reassure the class that I will be looking for other students who can show me that they are listening (TS\_Ross\_21/08).

It appears as though Ross's comments were informed by his experience during his field experiences. He commented on the use of positive reinforcements to encourage this behaviour and to assure the children that he would be continually looking for this behaviour, thus encouraging long-term behaviour change.

A random event in ClassSim is the late arrival of Bibi with a DOCS officer. The user must decide how to proceed. In Marc's 'Thinking Space' he likened the situation to a field experience when his supervising teacher asked her class to wait quietly while she spoke with the student teachers.

At a school the teacher of a year 1 class asked the children to be quiet while she spoke to us, the university students. Although the children were quiet well behaved after only a few minutes of just sitting being "quiet" they started to become restless.

In my opinion the teacher should have given the children a task to perform while she was speaking with us. By doing this the children might have stay focused (TS\_Marc\_09/09).

Marc noted that the students from his field experience school found it difficult to stay quiet for a period of time without stimulation. Marc suggested that this was an erroneous decision on behalf of the supervising teacher. Therefore in his virtual classroom he decided to allow the teachers' aide to take over for a short period of time. This may also suggest that one of Marc's priorities in his teaching is to keep the students engaged to avoid behaviour management issues and for effective learning.

Whilst engaging with ClassSim the user is asked if they would like the aid of parent helpers for a particular lesson. In her 'Thinking Space' Mia rationalised the reasons they were unnecessary at this time.

Although some of the children are getting confused with the sequence of the Days of the Week I don't think that it is necessary at this point to have parents help during this classroom activity. I have made my decision based on my prac visits and field trips. I have seen parent helpers in action and I believe that the parents would be of better use helping with activities such as sport, arts and crafts and drama. I believe that as a teacher I will be able to teach the Days of the Week to the children independently without the help of parent teachers in the room (TS\_Mia\_18/08).

Mia made comment that she had witnessed parent helpers in her field experience classroom and as a result she believed that they are best utilised in situations that are less academic and require a certain amount of organisation, such as sport, drama and art. This may indicate that Mia believes that teachers have more knowledge about content, knowledge about child learning, and knowledge about teaching and as such are better suited to aid children in these areas. This is evidence that she feels confident in her knowledge of these areas, and thus has a well-developed professional identity. Furthermore, this may also indicate that although Mia has witnessed the inclusion of parent helpers she has not had direct experience with them, and as such does not understand the assistance they are capable of providing.

During her field experience Lauren's supervising teacher suggested she attempted to cater for the short attention spans of the class members by conducting short engaging lessons. Lauren reflected upon this proposal and suggested that this strategy would also be beneficial for Gavin (in the ClassSim).

My teacher said to conduct short, interesting lessons that constantly were changing to cater for students with a short attention span. This strategy would work for students such as Gavin (FER\_Lauren\_09/11).

Lauren was not only able to see similarities between her field experience students and the students from her virtual classroom, but she was also able to make suggestions on how to improve her teaching for the learning needs of the virtual children.

During an interview Zoe explained that when the DOCS officer entered her virtual classroom with Bibi in tow, she knew instantly which decision she would choose, largely due to the fact that she remembered a child protection lecture, from her first year enrolled in her degree.

Because I remember the child protection stuff from first year. The lecture really stuck in my mind, so when the DOCS lady interrupted I just knew what to do. There's the whole duty of care thing (I\_Zoe\_20/08).

Zoe decided to have the teacher's aide take control of the class, thus accounting for her duty of care while her attention was elsewhere. This may also suggest that as Zoe was able to recall the content of a lecture held two years prior, as the lecture was reasonably influential in her understanding of the role of a teacher.

In his 'Thinking Space' Ross explained how he would cater for the learning needs of Bibi. He made note that he would teach her to break down words into their simplest components (phonics).

I would direct very basic questions at Bibi - concentrating on a specific day of the week, as she will have to develop sounds of letters to form an entire word – phonics (TS\_Ross\_21/08).

Although Ross did not specify where he learnt of this strategy, it is usually introduced in a subject focusing on language and literacy for primary aged children. Thus, it appears as though Ross drew upon his understanding of teaching literacy from his university coursework and was able to suggest its use in the context of his virtual classroom. Further, this may indicate that Ross's professional identity has developed to a point that he understands and uses professional terminology in his daily language.

Ross made reference to another teaching strategy in his 'Thinking Space'. Ross commented on the use of immersion when teaching the 'days of the week'. "By the teacher having the elephants on the board with the Days of the Week it keeps them immersed in the situation" (TS\_Ross\_21/08). Although Ross did not expand on the use of this strategy, it appears to have come from a university subject focusing on language and literacy for primary-aged children. In this subject the pre-service teachers are introduced to Cambourne's conditions of learning, one of these conditions being immersion. Thus, Ross appeared able to draw upon his understanding of child learning and development from his university coursework to comment upon its use in his virtual learning environment. This knowledge may also have come from his previous field experiences, textbook readings, and conversations with supervising teachers and other pre-service teachers. This may also suggest that Ross uses teaching jargon in his everyday language, thereby reinforcing his developing professional identity.

After engaging with the virtual learning environment Lauren explained that she not only utilised her 'Thinking Space' to reflect upon the scenarios presented, she also used it to store information she may refer to at a later time.

I also used my Thinking Space to cut and paste a lot of other information [laughs] that was there, I thought I could use this, maybe not now but at some other stage and just to go back when I've got more time (I\_Lauren\_16/11).

Lauren's strategy to collect important information and store it in her 'Thinking Space' suggests that she found the information relevant and useful. This may indicate that Lauren intends on using this information in her future career as a teacher or as information she may use in her university assignments.

In Marc's 'Thinking Space' he reflected upon a lesson and how he may alter it. Marc suggested that the lesson was effective in that it would successfully scaffold the writing of his students. He also suggested the inclusion of questioning during the lesson to include some informal assessment.

The poem is a great way to scaffold the children into a writing lesson. Asking the children "who can tell me some of the things the writers have done in this poem?" allows the children to give their own opinions of what they learnt throughout the poem. This will then give the teacher an overview of what the children are learning from the poem. The teacher can then match this against the outcomes and indicators of the English K-6 Syllabus (TS\_Marc\_09/09).

Marc's suggestion of including questioning during the lesson indicates his understanding of informal assessment as a means to determine the students' understanding. He also makes reference to the syllabus as a means to establish how these students are progressing in relation to the state-defined outcomes. Marc's suggestions indicate that he was able to draw upon previous practical examples of the use of syllabuses and/or his university training in order to gauge the understanding of his students.

Overall, the majority of the third-year pre-service teachers were able to draw upon their previous field experiences to make decisions within the virtual learning environment. Four of the third-year pre-service teachers were able to identify when they drew upon their university knowledge when engaging with ClassSim. However, it is important to note that although only four were able to articulate these connections, it is not an indication that the other third-year participants did not build upon these connections.

### **Reflecting on Experience**

It is believed that reflection is an essential aspect of an effective learning experience for adults (Knowles, Holton and Swanson, 1998), as adult learners need time to contemplate the ramifications of the learning experience to their experience and responsibilities. However it must be noted that experience itself is not valuable, rather, "what is valuable is the intellectual growth that follows the process of reflecting on

experience” (Criticos, 1993:162). The findings suggest that the majority of the third-year pre-service teachers were able to *reflect-in-action*, by reflecting upon activities/decisions as they engaged with ClassSim, and thus guide future directions. *Reflection-on-action* was demonstrated by reflecting upon activities/decisions that have occurred and suggesting alternative scenarios as well as occasionally making links to previous experience and university coursework. This appeared to guide their direction within the virtual learning environment. *Reflection on the reflection-in-action* occurred when they re-visited their ‘Thinking Space’ to re-examine their reflections in order to gain a better understanding of their learning. The findings indicate that *reflection-in-action* and *reflection-on-action* were the common types of reflection. However, only two of the seven third-year pre-service teacher participants engaged in *reflection on the reflection-in-action*.

Lauren explained her use of the ClassSim’s ‘Thinking Space’ as a place she can take notes and re-visit information she is already familiar with.

I used the ‘Thinking Space’ to keep my notes. You can write down stuff you come across, which is good for learning, you know re-visiting something you learnt and better understanding it (I\_Lauren\_16/11).

Lauren explained that by re-visiting information she previously learnt enabled her to better understand the information.

Isabella utilised her ‘Thinking Space’ to reflect upon the possible consequences of the decisions she was required to make. One such decision asked the user to either ignore the fact that a child is crying or to address the child and ask her to participate. Isabella reflected upon this in her ‘Thinking Space’.

When Bibi starts to cry it is my responsibility as a teacher to ask her to participate in the class demonstration.

There is a choice to ignore her, however I think that this would not be a very good option as it seems to be something that occurs quite often, therefore it is something that I am going to have to deal with in one way or another.

Maybe during the first few weeks of kindergarten I would tell Bibi that “we will try tomorrow” while she settles in to a class atmosphere, however I would not use this strategy for a long period of time.



Bibi is part of the class, just like the other 22 children; therefore she needs to be treated as a member of a class.

Bibi needs to understand that she can't always have things her own way. She also needs to become a little more independent. She seems to be very dependant of Mary.

If the other children see Bibi getting 'special consideration' then they may begin to cry just so that they too can sit next to their friend (TS\_Isabella\_30/08).

Isabella noted that her decision to placate Bibi may have further implications for the rest of the class, that they may imitate Bibi's behaviour to get their own way. This reflection indicates that Isabella's teaching philosophy is guided by the notion of consistency as it helps to create a balanced learning community and limits the amount of teacher bias towards students.

Marie also utilised her 'Thinking Space' to reflect upon the consequences of the decisions she was making. One of the decisions the user comes across is whether to go outside and greet the students before class or to stay inside and finish organising the morning. Marie was unhappy with the amount of information provided by the virtual learning environment. She noted that she would stay inside if there were dangerous objects to be put away.

The teacher should finish what she was doing inside if she needed to clean up dangerous objects like scissors etc., as this could be potentially harmful if these things are left lying around when the students come inside. But I think it's important see the children before the morning lessons (TS\_Marie\_30/08).

This indicates that Marie feels it is important to greet her students before the morning lesson begins, however she feels it is more important to ensure the classroom is a safe environment.

When Ross encountered the same decision during his engagement of the virtual learning environment he used his 'Thinking Space' to discuss his rationale, his decision. He explained the advantages and disadvantages for either option.

Before The Bell Rings

In a case such as this I would consider the possible outcomes of both situations  
Stay inside

If I stay inside I could get my work done but at the same time I won't obtain knowledge about the students that could be beneficial for the day.

Go Outside

By going outside it will give me the chance to monitor the students attitudes before they enter the classroom, it will also give me the chance to speak with the parents.

If I go outside will I be able to catch up on what still needs to be done in the classroom? (TS\_Ross\_21/08)

Ross weighed up his options with consideration for both decisions, finally deciding to go outside and greet the children. Through his rationale Ross attempted to identify any apparent consequences of either decision. This suggests that Ross used his 'Thinking Space' as a space to rationalise his thinking and as a way of assessing the probable outcomes of either decision.

During an interview Lauren was asked if she has had a chance to return to her 'Thinking Space'. She explained that after her use of ClassSim she engaged in hindsight reflection and re-accessed her previous reflections to gain insight into her thought patterns.

My reflection generally happens at a later stage and I think 'now it's all over what do I think'. I was glad that I could go back to the thinking space, like I could go back now and see why I did something or what I was considering at the time (I\_Lauren\_16/11).

Lauren suggested that she gained further insight about her thinking processes in regards to the events in ClassSim and thus improved her understanding of her learning and her engagement with the virtual learning environment.

Marie also explained that she re-accessed her 'Thinking Space' reflections. She suggested that re-reading her previous reflections aided her in understanding her own learning.

My reflection tends to happen well after the fact. And at the moment going back to my 'Thinking Space' it's there and I can see where I wanted something to go and why. I guess looking back on things helps us to understand our learning (I\_Marie\_20/08).

Marie explained that her ‘Thinking Space’ reflections helped her to track her thinking processes whilst engaged with ClassSim, thus giving her insight into her thinking patterns and learning.

Overall, the findings suggest that the third-year pre-service teachers typically utilised their ‘Thinking Spaces’ as an area in which they can store useful information (for later reflection), a place where they can rationalise their decision-making processes and to keep track of their professional learning.

### **Self Concept**

Previous understandings of ‘Self Concept’ refer to the learner taking responsibility of their own learning via self-directed learning (Knowles, 1980; Knowles, 1984; Knowles, Holton and Swanson, 1998). Through engagement with the virtual learning environment the pre-service teachers are given the opportunity to become more self-directed, by taking responsibility for their own learning and the direction it takes. However, in regards to this inquiry a focus was also on if/how the third-year pre-service teachers utilised their engagement with ClassSim (in conjunction with their other experiences) to develop their professional identity. ‘Self Concept’ is discussed in terms of structure and support of learning experiences and professional identity.

### **Structure and Support of Learning Experiences**

The virtual learning environment can be used in a non-linear manner, thus allowing adult learners to follow the path that most appropriately reflects their need to learn. Two of the seven third-year pre-service teachers made comments suggesting that they did not require the additional support material provided by the environment as they believed they had a competent understanding of the language and strategies referred to throughout ClassSim.

After engaging with the virtual learning environment Mia made comment that she did not require the support provided by the summary material, as she believed that her

knowledge about the teaching strategies and other terminology found in ClassSim was language that she regularly used.

I think by this stage I wouldn't need definitions of those words. I knew exactly what they're meaning and they're just common language. I think if I was doing first year, I would probably need the explanations, but now it's expected that you know them. Whereas when you're just starting out it's good to introduce people to the terms that they will use. So yeah, I knew exactly what was going on with that type of language that was being used and I felt comfortable to understand what was being explained within the program (I\_Mia\_21/08).

During an interview Marie also made comment that she did not require the support of the summary material to help her better understand the terminology used throughout ClassSim. She said she did access them, however, to confirm her understandings.

Because I'm in third year, a lot of the references I understood already. So I didn't need to go in and find them, I just looked to see what you put and then I thought 'oh okay' then I just got back out of it because I've got those things already. But they are certainly very good tools to have in there for newer pre-service teachers (I\_Marie\_20/08).

Marie's use of the summary material may suggest that she is still developing her understanding of the terminology used in teaching. Although she said she did not need the references to understand the concepts, it appears as though she needed the extra support to confirm her knowledge.

Overall, the findings suggest that most of the third-year pre-service teachers did not make use of the support material available as they were confident in their knowledge and understanding of teaching terminology and strategies presented within the virtual learning environment.

### **Professional Identity**

A teacher's professional identity is shaped by their understanding of the theories of teaching/learning and their unique set of life experiences, and as such play an important part in pre-service teacher education. In regard to this inquiry all of the third-year pre-

service teacher participants indicated that their engagement with ClassSim (in conjunction with their other learning experiences) contributed to the development of their professional identity.

After engaging with ClassSim, Lauren visited the class she would be teaching during her final field experience. During an interview Lauren explained that she did not take advantage of any opportunities presented to employ behaviour management techniques during these visits, as it was not her place as a classroom visitor.

I was in school visits last week. The teacher still in control I was doing some stuff with them, and to me it felt like they were getting out of control, I could of stepped in and done something but I chose to stay back cause the teacher was there and it's not my place. But in reality I thought I could have taken that opportunity to do something about that situation and it would have been okay with the teacher, I'm sure, but it was just one of those things (I\_Lauren\_22/08).

Lauren saw an opportunity to reinforce her position as the class's teacher, but decided against it. This suggests that Lauren did not perceive herself to be a 'teacher', which implies that her professional identity is still developing.

After her final field experience Zoe was asked if there were any similar students in her class to what she experienced in ClassSim. Zoe commented on the behaviour of a particular student as being similar to Gavin (a child with ADHD in ClassSim).

My prac teacher is pretty good with him she's got a lot of experience. She was just an assistant principle; she deals with all the discipline. The whole class has got a lot of respect for her, I think it's when there's a student teacher in there it's a change of dynamics he's trying to show off or trying to get attention by doing that but usually he's pretty much under control ... I did have the opportunity to deal with his behaviour because I see it, but then I go and speak to her [the teacher] to say what happened and why I did it and if she needs to follow anything else up she will (I\_Zoe\_16/11).

Whilst responding to the question Zoe referred to herself as a student teacher and that her presence seemed to excite and distract the student. This statement suggests that Zoe perceived herself to be a student teacher, even though she was at the end of her final year of university, and would be a qualified teacher by the end of the year.

Whilst engaging with the virtual learning environment Marc commented on the reflective thoughts of the virtual teacher. The virtual teacher's reflection noted her nervousness about the up and coming day with reference to particular students, even though she had taught kindergarten for a number of years. Marc found this to be surprising with her amount of experience, but made a connection to how he feels before teaching.

That the teacher still gets nervous I find slightly surprising ... but oh well ... having read on I can understand it though ... Before I teach I often worry about how well behaved certain members of the class will be (TS\_Marc\_09/09).

The reflective thoughts of the virtual teacher supported Marc's own feelings, as he has an understanding that all teachers, no matter how experienced, can feel nervous before teaching.

When asked how she responded to the virtual learning environment's behaviour management issues, Marie explained that her behaviour management philosophy is anti-reward in nature, that her focus is on intrinsic motivation rather than extrinsic.

I'm an anti reward person, I don't like the idea of rewards, I just feel like it's giving a dog a bone sort of thing. I like to go for the intrinsic you know, good on you, and praising your child to work harder for themselves and not work harder for a sticker cause what I see in reality if stickers are given out for when are children sitting on a mat then ten minutes later they are playing with the kids next door. So it's really ineffective ... Yeah I am looking for long-term goals. I'm really anti reward, I've tried it on my own children and instant rewards don't work. They don't change behaviour long term they change behaviour for the two seconds that you want to change and then it changes back again because they know if they repeat a bad behaviour then repeat a good behaviour they'll get a reward again, so they're not stupid. You can even see it on ClassSim, when you put their name on the reward chart thing, they don't change. I just think it's important to get a whole intrinsic motivation thing not the extrinsic (I\_Marie\_13/11).

Marie explained that her philosophy of teaching embraces intrinsic motivation as it has the potential to effect long-term behaviour. Marie suggested that she came to this conclusion as a result of managing her own children's behaviour. Thus Marie's

philosophy of teaching regarding behaviour management is grounded in the use of intrinsic motivation. This philosophical belief of intrinsic motivation emerged as Marie raised her children and was reinforced when she was on field experience and engaged with ClassSim.

During an interview Lauren was able to identify a teaching approach she found in the virtual learning environment that she disagreed with, however she could not suggest an alternative.

I guess some of the techniques she [the virtual teacher] used though I didn't agree with but it wasn't, that I didn't have a better one in mind, I was just thinking I'm not comfortable with that approach. But what would I do instead? I didn't know. If it was reflection, I'd say I've got a better idea that's not my style. What is my style? I don't know yet (I\_Lauren\_16/11).

Although she was unable to propose a suitable alternative to this strategy, she appeared adamant that it did not suit her style of teaching.

Whilst engaging with ClassSim Mia's virtual class entered the classroom in an unruly manner. Mia commented on this in her 'Thinking Space'.

I believe that there should be a set out guideline for entering the room and that a student found not following these rules should be placed though the discipline system.  
Also on the front of the door there should be the rules written up with a pictorial representation to go with it (TS\_Mia\_18/08).

Mia's approach to class management not only included the need for class rules, but also the need to enforce them. Through the use of ClassSim's 'Thinking Space' Mia was able to reflect upon an issue important to her; classroom management. However, it appeared that Mia did not access the support material within ClassSim. If she had, she would have read the support material containing the list of class rules. This may be an indication of confidence, lack of interest, or a combination of these and other factors.

In his 'Thinking Space', Ross reflected upon the use of praise in his classroom to enhance a student's self esteem and to acknowledge their contribution.

A teacher should praise students as much as possible as it allows them to feel a sense of worth within the classroom ... By the teacher praising the students she is rewarding their efforts within the classroom. This is essential, as each student needs to be acknowledged in some way for contributing to class discussion (TS\_Ross\_21/08).

Ross's reflection indicates that he has firm beliefs in the use of praise in the classroom, believing it to be advantageous to both the students' self worth and the development of a class community. Thus Ross's approach to teaching includes the use of intrinsic rewards to foster a community of learners and encourage self-confidence.

During her engagement with ClassSim Zoe reflected upon the notion of consistency in regards to behaviour management. After an incident with a virtual child, she suggested that she must stay consistent in her approach to this conduct.

I would reprimand Gavin. He needs to know that his behaviour is not acceptable as much as it is difficult to keep doing. I think I would try and be consistent and reprimand him when he does something like disrupting the whole class and creating a scene because it is impacting on everyone else and everybody else needs to know that behaviour like his will not be tolerated. On the other hand, while doing this I would also try to work hard to strongly encourage him when he behaves well (TS\_Zoe\_18/08).

Zoe's teaching philosophy is guided by the notion of consistency as it helps to create a balanced learning community and limits the amount of teacher bias towards students. Thus, it appears as though Zoe's professional identity is developing as a result of her engagement with ClassSim and her other experiences.

Whilst engaging with ClassSim Isabella also commented on the notion of consistency. She suggested that she would allow Bibi to sit with a friend whom she is comfortable with in the beginning stages of her time at school.

Although I would let Bibi sit next to her friend initially so that she can build her confidence and security, what you do for one student you must do for all of the other students and I wouldn't want to favour Bibi (TS\_Isabella\_30/08).



Although Isabella could understand the need to cater for Bibi's needs, she suggested that a teacher's concessions for one student should be the same for another student. Thus, Isabella's 'Thinking Space' reflections indicate that her philosophy of teaching is grounded by the principle of consistency. This indicates that as a result of her engagement with the virtual learning environment Isabella's professional identity was further developed.

One of the lessons available for inclusion in the user's 'literacy block' focuses on the use of a 'days of the week' chart. Zoe decided to use this lesson as the introduction to her 'literacy block' and rationalised this in her 'Thinking Space'.

I believe that the chart is a good way to start off the day as it focuses on both literacy (reading, talking and listening) and mathematics (how many boys and girls are here today?)

I think that the chart is a great idea as it will allow me as the teacher to model the chart to the children and will also allow me to assess which children are recognising the Days of the Week and which students are struggling.

I would ask questions that prompt thinking for all the children in the class

What day on the chart do we have swimming?

Can you show me which day on the chart is your news day?

What is another word that we could use to describe the weather outside today?  
(TS\_Zoe\_18/08)

Zoe displayed a competent understanding of the English K-6 syllabus, which indicates a developing professional identity. Furthermore Zoe's 'Thinking Space' gives evidence of her emerging knowledge about teaching/learning through her suggestions on how she might teach the lesson (questions she might ask – knowledge about teaching), her knowledge of the content, and her rationale on why it was an appropriate choice for this class at this time (knowledge about learning).

Whilst engaging with the virtual learning environment Marc made comment on the need to be flexible in terms of lesson plans. He explained that if the students lose focus it is important to implement new strategies to keep them engaged. Marc also explained that this new activity may give the teacher an opportunity to do some informal assessment.

In my opinion it was a good idea for the teacher to re-arrange the Days of the Week on the blackboard when the children were beginning to fidget. I would have done the same thing in a situation like this so that the children are engaging in an activity that re-directs their focus to learning the Days of the Week. By using the FFF, SSS strategy the children are given the opportunity to engage in an activity that they may find interesting. This is a good opportunity for the teacher to assess their knowledge about matching sounds with words (TS\_Marc\_09/09).

Marc's 'Thinking Space' revealed that he would have decided to do something similar had he been in the same position. This suggests that he can be flexible in his teaching to adapt a lesson to meet the needs of the students and is confident in his teaching abilities to do so. This may be an indication of a sound professional identity. Furthermore, Marc also made comment that he would have used this opportunity to engage in some informal assessment. Thus, Marc was aware of the outcomes and indicators a kindergarten student must display (according to the state syllabus), which is also evident of a competent professional identity.

During an interview Mia was asked what she based her decisions upon whilst engaging with the virtual learning environment. She suggested that it was a combination of her university coursework and previous field experiences; however she was unable to give specific examples.

I used some things from university, ideas I've got from my prac and various things. I wasn't too worried when it came to decisions. For example, there was one choice I had to make regarding what lesson I would do first. There were a number of options so I just used my knowledge of what kind of lesson, that didn't feel was too challenging for the class. Most things I chose in the sim were based upon my previous experience in schools or from my readings, but I can't be sure exactly where I got the knowledge. I just have it (I\_Mia\_21/08).

Mia was able to draw upon a range of previous experience and knowledge regarding teaching when engaging with the decision-making opportunities available in ClassSim. Although Mia was unable to determine exactly where she acquired this information, what is important is that she was able to draw upon this knowledge and apply it to the context of the virtual learning environment. Therefore, through engagement with ClassSim, Mia made connections between theory and practice, thereby appearing to strengthen her professional identity.

When asked what knowledge and experience Zoe drew upon whilst engaging with ClassSim, she suggested that it was from various sources. She explained that her knowledge is an amalgamation of her learning throughout her degree.

Maybe from things I learned at uni, but it's just kind of being mashed into you throughout your whole teacher training. So I think just all the bits and pieces kind of tie together by the end of third year, so you can't say this in particular is the thing that got me to this point, it's just overall you've got this general knowledge of all the things you need to think about as a teacher. That's hopefully what you should have since most people or enough of them are going to be teaching next year in the classroom so they can't say, 'hang on I've just to go and get a book and find out what it said', they need to know it in their head, and have books as back up (I\_Zoe\_16/11).

Zoe's description of her knowledge bank indicates that the connections she has made between her university coursework and field experience, are so entwined that she cannot decipher the origin of her knowledge. Furthermore she explained that it is not important where this information came from, rather that it's there. This is further evidence of her professional identity, that she is confident in her knowledge and experience, but is aware that there are means to gain support if needed.

Overall, through engagement with the virtual learning environment and other experiences, many of the third-year pre-service teachers were able to identify and articulate their emerging teaching philosophy, thus developing their own professional identity. The findings also suggest that through engagement with ClassSim and their field experience, a number of third-year pre-service teachers have incorporated teaching terminology into their everyday language, thus enhancing their professional identity. Further, some of the third-year pre-service teachers were able to make connections between their university coursework and their field experience via engagement with the virtual learning environment, thereby supporting their developing professional identity.

## **Summary of Third Year Pre-service Teacher Case**

The findings indicate that the third year pre-service teachers often drew upon their previous experience and/or knowledge when making decisions within the virtual learning environment. Furthermore, the third-year pre-service teachers used this experience and/or knowledge to reflect upon their thought processes whilst engaged with ClassSim. Some of the participants identified ClassSim as a worthwhile learning experience as it enabled them to experience scenarios for the first time and aid them in their understanding about student needs and teaching techniques. Further, a number of third-year pre-service participants were able to identify areas of need in their knowledge base through their engagement with ClassSim. In addition, it appears as though a number of third-year pre-service teachers found that the number of options available was too limiting for their level of learning. A major finding was that a number of the third-year pre-service teachers found ClassSim to be game-like in that there were only 'right' and 'wrong' answers/decisions, thus detracting from their enjoyment. Furthermore, some third-year participants voiced frustrations regarding the unrealistic time available during the virtual lesson compared to real-time in real-classrooms.

In conclusion, the findings suggest that the majority of the third-year pre-service teachers found that at this stage of their degree, ClassSim did little to help in preparing them for their final field experience, and most suggested that ClassSim was probably more suitable for first-year students. However some participants found ClassSim to be a useful tool for revising or affirming their current knowledge and experience, as well as identifying some gaps in their current knowledge.

# Chapter Seven

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## Comparison of Cases

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Comparative analyses of both the first (Chapter five) and third (Chapter six) year pre-service teachers are presented in this chapter. Semi-structured interviews and participant reflections (artefacts) were the primary data sources collected, and observations of the participants' engagement with the virtual learning environment as well as logs of user audit trails provided supporting data. This chapter discusses the comparative findings of both cases. An interpretative summary runs through the chapter as the cases are compared and contrasted with each other.

The purpose of this inquiry was to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experiences, and in particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identity. As in the previous two chapters the findings have been discussed under the principles of andragogy, as andragogy provides a framework in which the learning of the pre-service teacher participants can be reviewed and interpretations about their learning drawn.

### Comparative Case Analysis

#### Readiness

The principle of 'Readiness' is discussed according to purpose, value to learning, changing role, timing, and reflection.

## **Purpose**

The majority of first-year pre-service teachers found ClassSim to be an important tool in preparing them for their first field experience. The findings from the third-year pre-service teachers support this interpretation as they suggested that ClassSim did not help to prepare them for their final field experience. They claimed that it was probably more suitable for first-year pre-service teachers, as ClassSim provided a basic introduction to the practicalities of a classroom. A reason may be that the first-year pre-service teachers had minimal experience working in a classroom. Engagement with ClassSim gave them the opportunity to take on the role of a teacher for the first time, helping to prepare them for their impending first field experience. In contrast, the third-year pre-service teachers had completed two full field experiences (a total of thirty-five days) and completed twenty subjects (four subjects per semester for five semesters) and their subsequent assignments focused on their future professional role. It could be expected that they felt more prepared to undertake their roles as student-teacher during their final field experience. Furthermore, engagement with ClassSim was utilised by both cohorts of pre-service teachers as a tool to support their entry into the profession, as it provided a description of the multifaceted role of a teacher and scaffolded preview of the complexities that are bounded within a classroom environment.

The first-year pre-service teachers explained that they used ClassSim to experiment with decision-making opportunities and the consequences of these decisions. Some of the third-year pre-service teachers explained that they were also reminded of the consequences of behaviour management decisions when they used ClassSim. As a key component to the role of a teacher is being a decision-maker, the inclusion of decision-making opportunities within the software provided insight for the first-year pre-service teachers. It was through opportunities to take control and make decisions that ClassSim became a valuable field experience preparation tool for the first-year pre-service teachers. Such a claim appears justified through analysed data in which participants acknowledged that it exposed them to the sorts of decisions they may be faced with within a 'real' classroom context. In the case of the third-year pre-service teachers, it served as a revision tool affirming conclusions made about the work of a teacher.

The first-year pre-service teachers were able to build upon their confidence as teachers as they engaged with the virtual learning environment, thus better preparing them for their first field experience. Similarly, the third-year pre-service teachers indicated that engagement with ClassSim may be a tool in which they can build upon their confidence as beginning teachers as they engage in the complex process of reflection and identification of future professional learning goals. As such, it seems reasonable to suggest ClassSim can be used as a tool to build the confidence of pre-service teachers at any stage of their degree. Furthermore, the pre-service teachers' use of ClassSim may be a reflection of how they see themselves as teachers. For the first-year pre-service teachers, ClassSim provided them with a number of scenarios and issues to be aware of in the classroom, whereas the third-year pre-service teachers appeared to be increasingly comfortable with the complexity of the role of a teacher, evident from their perceptions of ClassSim being a little simplistic for their stage of learning.

### **Value to Learning**

The support material available throughout the virtual learning environment enabled the first-year pre-service teachers to make connections with their current and past subject content via the scenarios presented and the additional support material available. Terminology such as 'literacy block' was one example of this, where a first-year pre-service teacher was able to better understand what a 'literacy block' is and how it might look in a kindergarten class through her engagement with the scenarios presented and access to the summary material. This was reinforced by interview data collected from a third-year pre-service teacher who suggested a first-year pre-service teacher would have been able to make valuable connections between a subject focusing on 'language and literacy' for primary-aged children when using ClassSim as a virtual practical example with supportive literature. In contrast, the third-year pre-service teachers appeared unable to articulate strong connections between university coursework and engagement with ClassSim. This may be due to the knowledge accumulated throughout the degree and the quality of the previous field experiences.



Isabella and Lauren (third-year pre-service teachers) explained that their engagement with ClassSim was somewhat valuable to their learning as ClassSim provided them with ideas for their future lesson planning and ideas on how to integrate an ESL child into a classroom. These examples may have been identified as being beneficial as they were in their final year of their degree and the prospect of teaching their own classes seemed a more tangible experience. This is an interesting finding, as some of the third-year pre-service teachers are confronted with the enormity of the task of becoming a teacher and as such feel the need to build a ‘tool kit’ of lesson plans and teaching strategies to ‘survive’ beginning teaching (Boreen, Johnson, Niday & Potts, 2000). Thus, it was found that the lesson ideas and teaching strategies were more advantageous to their present learning needs and future careers as teachers.

### **Changing Role**

The first-year pre-service teachers were in the initial stages of progressing from the role of student to that of teacher. It appears as though this was due to the first-year pre-service teachers’ lack of experience in the role of teacher and understandings of what the role entails, and more importantly their previous role as a student for the entirety of their education (as the majority of the first-year participants have proceeded to tertiary studies straight from high school). Moving from the role of a student to that of a teacher is an important step in the development of a teacher’s professional identity. The lack of evidence suggesting that the third-year pre-service teachers were progressing from a student to a teacher emphasises this point; as the third-year pre-service teachers have had some experience as teachers whilst on field experience and have already begun developing their professional identity. Further, the third-year pre-service teachers appeared more aligned to see themselves as teachers, evident from their critiques of their ‘virtual colleague’s’ practice. Overall, the first-year pre-service teachers suggested that engaging with ClassSim enabled them to experience the role of a teacher for the first time and thus assisting them to better understand the role of a teacher.

## Timing

During their first semester of their degree the first-year pre-service teachers were enrolled in three core subjects, including a ‘Professional Practice’ subject (which included ten single days of school immersion visits followed by a two-week field experience), a subject focused on ‘language and literacy’ for primary-aged children, a subject focused on ‘child development’, and an elective subject. The first-year pre-service teachers were introduced to ClassSim during ‘Professional Practice’ in the first week of their degree. This introduction consisted of a brief outline of the software including its navigation tools. The first-year pre-service teachers engaged with the ClassSim as part of their usual class schedule the following week. Their engagement with ClassSim was positioned by the subject as a glimpse into the workings of a classroom, and thus they were encouraged to use the virtual learning environment to learn more about the role of a teacher in regard to decision-making and interacting with children.

In contrast, the third-year pre-service teachers were introduced to ClassSim during the third week of their final semester of their university degree within a core subject (‘Professional Practice’, which involved five days of school visits followed by five weeks of field experience). During this time the third-year pre-service teachers were also enrolled in two elective subjects focused on specific Key Learning Areas (within the K-6 curriculum). Whilst engaging with ClassSim, the third-year pre-service teachers were encouraged to consider the multifaceted role of a teacher in more depth as they examined their own professional learning interests. For example, one third-year participant decided to focus more on the emotional affects of her decisions upon her students, whereas a first-year participant was encouraged to explore the teacher’s interaction with the children. This may be because the first-year pre-service teachers have limited knowledge about the practicalities of a classroom and thus are at a less advantaged stage of their learning. Therefore many of the first-year pre-service teachers may have utilised a more exploratory approach when engaging with the virtual learning environment, whereas the majority of the third-year participants appeared to have adopted a more in-depth approach to working with ClassSim. Furthermore the

placement of engagement with ClassSim within the pre-service teacher program may be seen as problematic for the third-year pre-service teachers, in that it was situated in the semester prior to them becoming fully qualified teachers. Thus, their priorities may not be aligned with the exploration of a virtual classroom and an activity that adds value to their current learning needs.

## **Orientation**

‘Orientation’ is discussed according to the relevant scenarios presented in ClassSim and the participants’ identification of their need for new knowledge.

## **Relevant Scenarios**

Both the first and third-year pre-service teachers demonstrated they were able to make connections between what they were learning in ClassSim and how it might apply to their future career as a teacher. The first year pre-service teachers found their engagement with the virtual learning environment to be a worthwhile learning experience as it presented them with relevant, real-life examples of a classroom. Comments made suggested that ClassSim prepared them to think about the number of interruptions a teacher might face during a typical day, thus reinforcing their understanding of time management. They also suggested ClassSim provided them with a tangible scaffold on how a ‘literacy block’ might be structured. Overall, the first-year pre-service teachers explained that ClassSim was a relevant learning tool as it enabled them to gain insight about the role of a teacher and the scenarios they may encounter. The third-year pre-service teacher participants found ClassSim to be a good representation of a ‘real’ classroom. They made comment on the inclusion and use of resources such as the ‘Days of the Week’ chart commonly found in most Early Stage One and Stage One classrooms. They also made comment on the work samples created by the virtual children, comparing them to work samples seen on field experience.

Although both cohorts of participants suggested that ClassSim presented them with relevant and real-life scenarios, their comments were quite different. It appears as

though the first-year pre-service teachers may have identified similarities on a broader level, looking at the overall role of a teacher, whereas the third-year pre-service teachers have identified similarities on a more specific level, focusing upon the role of a teacher in regard to understanding individual children's needs and the teaching resources used on a day-to-day basis. This may be the result of their developmental stage. The first-year pre-service teachers were still in their initial stages of understanding teaching and in the initial stages of developing a professional identity, and thus used ClassSim to gain a 'big picture' understanding of their future career. Alternatively, the third-year pre-service teachers have had two and a half years of field experiences (a total of thirty-five days) and two and a half years of university coursework, and thus have had more time to gain an understanding of the role of a teacher and the complexities of the classroom environment, and thus develop their emergent professional identity. Therefore, it appears as though their use of ClassSim was to improve upon their previous understandings and ability to delve deeper into the practicalities of a classroom.

As the third-year pre-service teachers appeared to adopt a more in-depth and focused approach when engaging with ClassSim, a number of third-year participants identified various discrepancies between 'real-life' and ClassSim, and questioned the relevance of the virtual learning environment to their learning. A main concern of the third-year pre-service teachers was the inconsistency of the virtual students when compared to 'real' students. They suggested that a virtual environment such as ClassSim could not completely represent the complex nature of students. Comments included ClassSim's focus on a few students at a time, whereas a 'real' classroom teacher would have to deal with the whole class, the fact that ClassSim is a computer program and the difficulties of relating to students on a personal level, and the limited nature of ClassSim in regard to student reactions. This may be the result of the amount and quality of the third-year pre-service teachers' field experience and their experience working with 'real' children. Alternatively this may be due to the value the third-year pre-service teachers perceive ClassSim to provide them in regard to their current learning needs. This was evident in their recommendation that ClassSim be used as an introductory tool for first-year pre-service teachers. Overall, the findings suggest that although ClassSim may have presented relevant scenarios, the virtual students were not realistic enough for the third-year pre-service teachers.

### **Need for New Knowledge**

The findings of both cohorts of participants indicate that engagement with the virtual learning environment enabled the pre-service teachers to identify areas of their learning that required further investigation and development. The first-year participants suggested that they felt unprepared to make a number of decisions within the virtual learning environment. This may be due to their lack of experience and knowledge about teaching and the role of a teacher, or the fact that for most, engagement with ClassSim was the first time they had looked at a classroom environment from the perspective of a teacher, rather than as a student. As these participants were first-year university students, it was expected that they may have limited knowledge and experience in these areas. Thus, it appears that ClassSim served as an introductory tool which allowed new pre-service teachers to gain a ‘big picture’ look at a classroom and the teacher’s role within it, and subsequently identify areas of their learning that they feel is important to their immediate and future learning needs.

The third-year pre-service teachers also identified a number of areas in their learning that required development as a result of engaging with ClassSim. These areas were predominantly concerned with the integration of ESL children and ESL student needs. This suggests that these third-year pre-service teachers have had limited experience working with ESL children during their field experience, possibly due to the cultural context of the areas where their periods of field experience were located. Through their engagement with ClassSim they have been encouraged to consider these students as possible students in their future classroom. This may also suggest that perhaps this type of knowledge may be missing from, or only briefly examined in, their university coursework. Another interpretation of the findings may be that the third-year pre-service teachers feel confident in their ability to undertake the role of a teacher during a ‘literacy block’, and have used their engagement with ClassSim to look more closely at the needs of individual students and how they can best cater for them. Overall, the findings suggest that through their engagement with ClassSim the pre-service teachers

were able to identify areas of their learning that need further development before entering their careers as teachers.

## **Motivation**

For the purpose of this inquiry 'Motivation' is discussed according to four factors: success, volition, value, and enjoyment in relation to the participants' engagement with ClassSim.

### **Success**

Both the first and third-year pre-service teachers were able to achieve a sense of success whilst engaging with the virtual learning environment. This came in the form of internal motivations. One of the internal motivators of ClassSim enabled the user to achieve an unknown or pre-defined purpose, such as a better understanding of the role of a teacher or gaining knowledge about teaching/learning. A number of the first-year pre-service teachers identified a sense of accomplishment at gaining a better understanding of the role of a teacher and better understanding of the decisions they will be required to make as a teacher. Therefore it seems reasonable to suggest the first-year pre-service teachers found their engagement with ClassSim to be a successful experience as it provided them with their first practical experience in a classroom and knowledge about the role of a teacher.

Another internal motivator of the virtual learning environment can be seen in the design of ClassSim where the user gains a sense of job satisfaction. After a decision-making opportunity the user can access 'Student Updates' and check the progress of the targeted children in relation to their decisions. The participants suggested that the 'Student Updates' provided them with a concrete means of gauging their success and in the creation of a two-hour 'literacy block' and meeting the needs of their virtual students, which emphasises the importance of gaining feedback.

In contrast, a number of the third-year pre-service teachers explained that they found the decision-making opportunities of ClassSim to be too limiting to gain a full sense of success when making decisions. Comments regarding this issue usually stated that the options available did not represent their preferred course of action and thus they were unable to be successful in taking ownership of the lesson and the class. These comments may be due to the number and quality of previous field experiences, or due to the fact that the third-year pre-service teachers have begun developing a professional identity and have a more extensive knowledge base of the teaching profession. Thus the third-year pre-service teachers have moved beyond simply observing and interacting with the virtual teacher and virtual classroom, to critiquing and internalising the virtual teacher's decisions.

### **Volition**

A number of the first-year pre-service teachers commented on their limited authority to make decisions whilst on field experience, and that their experience thus far has been restricted to merely observing the class. However, through their engagement with ClassSim they were able to assume the role of a teacher for the first time and make a number of decisions that directly affect their virtual class. This ability to make decisions was a key motivator in their engagement with ClassSim. Further, the decision-making opportunities presented in the virtual learning environment were identified by a couple of third-year participants as an important feature of their use of ClassSim. They suggested that although their previous field experiences gave them the opportunity to make decisions within a 'real' class, they were previously prohibited from organising the structure of their own 'literacy block'. Through their engagement with ClassSim however, they were empowered to take control over the structure of their own class.

Although some of the third-year pre-service teachers found ClassSim to be an empowering experience in regard to the design of their own 'literacy block', many of the third-year participants found their engagement with ClassSim to be too restrictive in terms of the number of decision-making opportunities and the options available at each. It was suggested that the number and type of options available at each decision-making

opportunity was too limiting for the third-year pre-service teachers to feel a sense of ownership over their virtual class. This may indicate that a number of the third-year pre-service teachers believed that the ClassSim was unsupportive of their level of knowledge and skills and that they are ready to take on the role of a teacher in their own class. However, the third-year participants did identify that they utilised their ‘Thinking Space’ to suggest alternative options at most decision-making opportunities. Therefore the cognitive tool of the ‘Thinking Space’ enabled them to gain a sense of empowerment in voicing their opinions, even though this reflection did not alter the overall progress of the lesson and management of the class.

### **Value**

The majority of first-year pre-service teachers found ClassSim to be an important tool in preparing them for their first field experience (as discussed under the principle of ‘Readiness’ - purpose), and as a tool to make valuable connections between theory and practice (also discussed under the principle of ‘Readiness’ - value to learning). The first-year pre-service teachers indicated that engagement with ClassSim was valuable as it enabled them to better understand teaching strategies such as questioning and it gave them the opportunity to repeat lessons, unlike in a ‘real’ classroom situation. Thus, the first-year pre-service teachers found the scenarios presented in ClassSim, along with the relevant support material to be valuable in better understanding teaching terminology and strategies, thereby enhancing their learning. Further, findings have indicated that they found ClassSim to be a safe environment in which they can direct their lessons without fear of adversely affecting ‘real’ children through poorly-made decisions. The environment also appears to have provided them with opportunities to see how the components of being a teacher are ‘played out’ in the classroom context.

The third-year pre-service teachers also found the virtual learning environment to be a valuable tool in practising their teaching techniques and as a tool to make valuable connections between theory and practice, thus affirming their accumulated knowledge. One participant commented on the obvious links between the university lectures she had attended throughout her studies and the information found in the support material. In



contrast, some of the third-year participants did not find ClassSim to be a valuable tool in their pre-service teacher training. They suggested that some aspects of ClassSim were more suitable to the learning needs of first-year pre-service teachers, therefore in order for a third-year pre-service teacher to get the most out of the experience they should use their 'Thinking Space' to reflect upon each issue in detail. Although these third-year participants found their engagement with ClassSim to be a somewhat valuable experience, it should not be used as a learning tool in isolation. An interpretation of this comment may be that the third-year pre-service teacher understands the importance of reflection to articulate understanding and grow as a professional, and thus appreciates the value of the ClassSim's 'Thinking Space' tool.

### **Enjoyment**

The first and third-year pre-service teachers reported that they found enjoyment in engaging with the virtual learning environment. This was often linked to the belief that ClassSim was a safe environment in which they were free to take chances with their decision-making opportunities, some even likening the virtual learning environment to a game. The use of the term 'game' suggests that the participants enjoyed playing with the virtual characters within the virtual scenarios. Thus it appears that engagement with ClassSim was a pleasurable and enjoyable experience. Although some third-year pre-service teachers found enjoyment in their engagement with the virtual learning environment, others suggested that this game-like resemblance created feelings that there were only 'right' and 'wrong' answers/decisions, thus detracting from their enjoyment. Some participants may have associated their engagement with ClassSim with an exam or test of their competencies, thereby distracting from their enjoyment. Another game-like characteristic of ClassSim, which distracted from the third-year pre-service teachers' enjoyment, was the unrealistic time available during the virtual lessons. It was noted that the ability to pause and reflect during a lesson did not reflect a 'real life' classroom context, and thus caused some frustrations for the third-year users.

Another aspect of ClassSim, which the third-year pre-service teachers identified as negatively affecting their enjoyment, was what they described as copious amounts of

information presented. It seems that the third-year participants agreed that the information provided was useful and of good quality, however they did suggest it was difficult to read this information on a computer screen and then associate this newly-acquired information with the characters of a virtual class. This poses some questions for software designers about what is reasonable for print text and what the balance should be across the multimodalities afforded by the virtual environment. Further, the third-year participants suggested that as the characters were computer-based it was difficult to develop a true understanding of them and to develop a relationship with them. This point emphasises the important component of relationship-building when taking on the role of a teacher. Thus it appears as though the program itself was a barrier to the enjoyment of the third-year students, largely due to the amount of text required to be read and the difficulty associated with developing a rapport with computer-based students. Thus, some third-year pre-service teachers did not enjoy their engagement with ClassSim to some degree.

## **Experience**

The principle of ‘Experience’ is discussed according to how the participants used their previous knowledge and experience to make links between theory and practice, and reflection.

### **Making Links between Knowledge and Experience (Theory to Practice)**

Both cohorts of participants were able to draw upon their previous experience and knowledge to aid their learning. Most of the first-year pre-service teachers were able to draw upon their experience working with ClassSim when on their first field experience. These include the basic structure of a ‘literacy block’, the use of modelled, guided and independent teaching strategies in lessons, time management, bathroom breaks, and behaviour management techniques. However, none of the first-year pre-service teachers identified themselves as drawing upon their university studies while on field experience. This may suggest that they have yet to make strong connections between the theory of

teaching (university coursework) and the practice of teaching (field experiences and ClassSim). Therefore it appears as though the first-year pre-service teachers found their engagement with ClassSim to prepare them for their first field experience and the practicalities of a classroom.

All of the third-year pre-service teacher participants were able to draw upon their previous field experiences whilst engaging with ClassSim, and some were able to identify when they drew upon their university knowledge. This suggests that not only did they find ClassSim to be similar to their field experience; they also were able to make connections between their university-acquired knowledge and the practice of teaching. For example, Ross commented on the use of phonics to enhance Bibi's sound/letter recognition (TS\_Ross\_21/08). Although Ross did not specify where he learnt of this strategy, it is usually introduced in a subject focusing on language and literacy for primary aged children (a core subject in 1<sup>st</sup> and 2<sup>nd</sup> year). Another example of a third year participant making connections between the theory of teaching and practice is when Marc commented on the effective use of scaffolding to support the virtual students in their writing (TS\_Marc\_09/09). In addition Marc suggested the inclusion of questioning during the lesson as a form of informal assessment making direct reference to the English syllabus. Overall, a number of the third-year pre-service teacher participants (such as Marc and Ross) were able to draw upon their understanding of their university coursework (theory) and suggest the use of strategies in the context of a virtual classroom (practice). Further, the understanding of the interrelatedness of theory and practice and their ability to make connections also suggests that these third-year participants have a better-developed professional identity. Therefore it appears that the third-year pre-service teachers were able to identify when and where they drew their knowledge and experience when faced with a teacher/classroom-related task/problem, whilst building stronger connections between their university coursework and the practicalities of a classroom.

## Reflection

The majority of the first-year students did not demonstrate reflections upon their bias, and assumptions in their 'Thinking Space' or in their field experience reflections; rather, they identified their assumptions and often assessed these assumptions during interviews with the researcher. Most of these assumptions were based upon the engagement of their students, the differing student needs, questioning of students, and the assumption of a 'good' and 'bad' student. The findings suggest that through the use of the 'Student Profiles' and 'Student Updates' the first-year pre-service teachers were able to understand that each student is unique in their needs as a learner and thus, as a teacher they must cater to these needs.

The majority of the third-year pre-service teachers used their 'Thinking Space' to reflect upon their decision-making processes and record their professional learning. Most third-year participants reflected upon the possible consequences of each decision, thus making a more informed decision. This technique of assessing each decision based upon possible consequences may be due to their previous field experiences or their university-based knowledge. One participant suggested that by storing information she previously learnt during her studies in her 'Thinking Space' and re-visiting this information at a later date enabled her to better understand the information, thus enhancing her learning. This may suggest that this third-year participant feels the need to refresh her understanding of concepts and strategies. It could also suggest that by re-examining her reflections she is engaging in *reflection on the reflection-in-action* (Schön, 1987) in order to gain a better understanding of her learning and prior thinking patterns, thereby coming to a better understanding of her own teaching. Overall, it appears as though the ClassSim's 'Thinking Space' was an important tool in the learning of both first and third-year pre-service teachers, but the third-year pre-service teachers were able to demonstrate more advanced reflections.

## **Self Concept**

‘Self Concept’ is discussed in terms of structure and support of learning experiences, and professional identity.

### **Structure and Support and Learning Experiences**

The first-year participants utilised the virtual learning environment’s branching opportunities to follow areas of interest and gain access to multiple forms of support material, thereby following a path of learning that most appropriately suits their needs. Furthermore, it appears as though the virtual learning environment’s support material was accessed by the first-year participants in order to make more informed decisions and supplement their learning experiences by introducing unfamiliar terminology and to clarify understandings. This may be due to the stage of learning the first-year pre-service teachers were at when engaging with ClassSim as they work towards an understanding of the complexities within the classroom environment. As they are in the beginning weeks of their pre-service teacher education, it is understandable that they have limited knowledge of teaching terminology and techniques. Thus, ClassSim enabled the first-year pre-service teachers to engage with classroom-based scenarios and the relevant sources of information thus providing support and structure for those who need it.

In contrast, the findings suggest that most of the third-year pre-service teachers did not make use of the support material available as they were confident in their knowledge and understanding of teaching terminology and strategies presented within the virtual learning environment. It appears as though the third-year pre-service teachers made connections between their university coursework and field experiences, and were able to apply their knowledge and experiences to their engagement with ClassSim without the additional aid of the support material. Therefore the third-year pre-service teachers utilised the virtual learning environment’s branching opportunities to skip sections already understood, thus following a path of learning that most appropriately reflects their needs.

## Professional Identity

A major finding of the first-year data was that engagement with the virtual learning environment acted as a vehicle for many of the first-year participants to begin their transition from the mindset of a student to that of a teacher. A number of first-year pre-service teachers made comment suggesting that their engagement with ClassSim helped them to better understand the role of a teacher. For example Daniel explained that his engagement with ClassSim enabled him to explore the role of a teacher and gain a better understanding about his future role (I\_Daniel\_23/07). Serena also utilised her experience with ClassSim to better understand the role of a teacher. When asked what she believed was the most beneficial aspect of engaging with the virtual learning environment, she explained that it helped her to gain an understanding of the classroom environment and the role of a teacher. She also indicated that before her engagement with ClassSim the only classroom experience she could draw upon was when she was a student (I\_Serena\_25/07). Overall, engagement with ClassSim enabled many of the first-year pre-service teachers to view the classroom from the point-of-view of a teacher for the first time, thereby aiding the emergence of a professional identity.

Engagement with ClassSim enabled both the first and third year pre-service teachers to articulate some of their personal beliefs about teaching and the role of a teacher. How the first and third-year pre-service teachers used their 'Thinking Space' to reflect upon the role of a teacher in regard to their own beliefs about teaching was evidence of this. Their 'Thinking Space' entries showed that they were able to identify various teaching and learning decisions, classroom management decisions, and behaviour management decisions that they were passionate about. For example, during Michael's engagement with ClassSim he noticed that the virtual teacher would often chose a select few students to praise, even when a larger number of students were behaving in a similar way. He suggested that whole class rewards may be more effective in this type of situation (TS\_Michael\_15/03). Another example is when Mia reflected upon an issue important to her; classroom management. She noted that classroom management should not only include class rules, but these rules should be enforced (TS\_Mia\_18/08). Further, after engaging with ClassSim Marie explained that her philosophy of teaching embraces intrinsic motivation, rather than extrinsic motivation as it has the potential to

effect long-term behaviour (I\_Marie\_13/11). Thus, engagement with ClassSim facilitated these pre-service teachers in identifying and articulating their teaching philosophy regarding classroom/behaviour management. Overall, the findings indicate that though engagement with the virtual learning environment, many of the first and third-year pre-service teachers were able to identify and articulate their emerging beliefs about the role of the teacher and the process of teaching, thus developing their own professional identity.

In addition, some of the third-year pre-service teachers demonstrated that they made connections between their university coursework and their field experience (as discussed above in 'Making Links between Knowledge and Experience (Theory to Practice)'). As a teacher's professional identity is shaped by their understanding of the theories of teaching/learning and their unique set of life experiences. This understanding of the interrelatedness of theory and practice and their ability to make connections is another indicator of the third-year participants developing professional identity.

# Chapter Eight

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## Discussion and Conclusion

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The purpose of this chapter is to explore the implications of andragogy in regards to the design of virtual learning environments for adult education. Further, this chapter presents recommendations for the use of a virtual learning environment in adult education and identifies considerations for further research.

The purpose of this inquiry was to investigate how pre-service teachers made use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experience, and in particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identity. The findings indicate that both the first and third-year participants were able to identify and articulate their emerging understanding of the role of the teacher in a kindergarten classroom and the processes of teaching and learning with this age group. This contributed to the development of their professional identity. Thus virtual learning environments have potential in preparing learners for their professional roles by aiding them in understanding the connection between theory and practice.

The inquiry was guided by one broad research question.

How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?

The sub-questions that further frame the inquiry were:

- *What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?*
- *In what ways can the virtual environment of ClassSim support the principles of adult learning?*

- *In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?*

## **Model of Virtual Learning Environments in Adult Education**

The model presented in this section emerges from the response to the central research question and the sub-questions framing this inquiry. Figure 8.1 represents the design, implementation and learning that was informed from the research presented in this dissertation. Research findings have shown that a virtual learning environment (such as ClassSim, profiled in this research) has the potential to provide a useful learning experience for the adult learner. However, to achieve most powerful learning, the implementation of the virtual learning environment needs to coincide with the learning needs of the adult learner and used in a way that is carefully framed to respond to learning outcomes to best support emerging understandings of the profession and their role within this. Adult learners need opportunity to interact and reflect on their virtual learning experience in well-defined and carefully-scaffolded ways to help them articulate professional experience and professional knowledge (and connections between and among) to help further refine their emerging professional identity. Future iterations of the ClassSim and other similar virtual learning environments may be informed by feedback from the implementation and emerging understandings as shown by the arrows underneath the model.

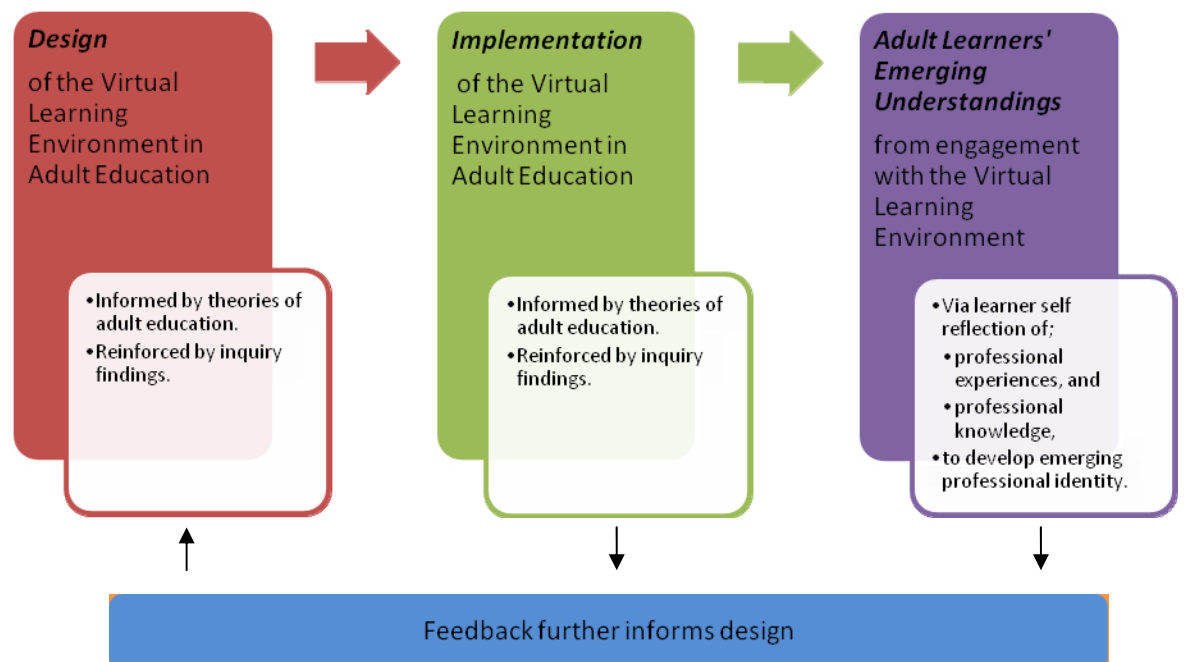


Figure 8.1: Model of the Design, Implementation and Adult Learning in a Virtual Learning Environment

Each of the components of the model will be examined and discussed in more detail in the following sections.

## Design Considerations for a Virtual Learning Environment in Adult Education Learning Contexts

Analysis of theories of adult education, the inquiry's literature review and reported research findings identify components of a virtual learning environment that can support the learning needs of adult learners. Each of these components is explored further below.

## **Features of the Virtual Learning Environment**

The features of the virtual learning environment that facilitate adult learning include relevance to the profession, structure and support, and motivation.

### **Relevance to the Profession**

Adults are motivated to learn something when, as Knowles (1980:44) explained, “they experience a need to learn it in order to cope more satisfyingly with real-life tasks or problems”. It is important that learning experiences within a virtual learning environment should, where possible, be concrete and relate to the learners’ needs and future goals. These may be adapted from the goals of the course or learning program. Speck (1996:36) agrees, remarking, “adults will commit to learning when the goals and objectives are considered realistic and important to them. Application in the ‘real world’ is important and relevant to the adult learner’s personal and professional needs”. Thus, adult learners are more likely to be engaged if learning experiences simulate situations that they will encounter in their future professional role. The findings from this inquiry concur, as the use of scenarios relevant to the profession of teaching was an important motivational component of the adult learning experience.

### **Structure and Support**

During their previous schooling, many adult learners may have become dependent learners who relied upon their teacher to provide them with information, organise the curriculum and provide step-by-step instruction (Knowles, 1980). However, adult learners often “resent and resist situations in which they feel others are imposing their wills on them” (Knowles, Holton & Swanson, 1998:65). Therefore an adult educator needs to provide learners with learning experiences in which the learner becomes more self-directed, taking responsibility for their own learning and the direction it takes. Further, the use of learning experiences needs to be carefully framed and contextualised within the broader program so participants see clear rationale for the time they spend

with the task with a view as to how it will support their professional understanding. Technology, such as virtual learning environments, can provide a self-directed learning environment, allowing the learner to follow non-linear pathways and the opportunity to follow the path that reflects their self-identified learning needs and immediate professional goals. Further, multiple forms of presentation of material can assist people with varying learning styles.

This inquiry found that a non-linear structure within the virtual learning environment, with opportunities for the user to access support material, encourages adult learners to create and follow a path of learning that meets their needs at a particular time. While a virtual learning environment has the potential to be a powerful way of preparing learners for their future profession, it needs to be recognised that the learners are at different developmental stages and thus vary in their learning needs. Careful consideration of placement of such experiences within a degree structure is critical.

### **Motivation**

Andragogy suggests that adult learners respond better to extrinsic motivators, particularly when they believe that what they are learning is relevant to their current and future needs. As a result, adult learners are likely to be intrinsically motivated if they: attribute their educational results to internal factors that they can control (e.g. the amount of effort they put in, they can apply their learning in the future); believe they can be effective in achieving desired educational goals; and are interested in mastering a relevant topic, rather than just rote-learning to achieve good grades. The design of a virtual learning environment used in this study incorporated virtual experiences that appeared to have the potential to motivate adult learners.

If any of these can be related as part of technology-based instruction, adults will respond more positively. Activities that build the adult learners' self-esteem, or sense of accomplishment through, for example, the completion of learning goals and real-time feedback, can help motivate the continuation of learning. In addition, the user's input into the path of their learning or in the choice of topics covered can help the users to

take ownership of their learning process. Analysis of the data in this inquiry, from the first-year participants in particular, suggests that motivation was important in the adult learners' continuing engagement with the virtual learning environment. The participants acknowledged that the inclusion of real-time feedback on their professional decision making, while engaging with the virtual learning environment, and assuming the role of a professional, gave them a sense of accomplishment as they were able to gain a better understanding of the profession and their future role. Furthermore, the participants of this inquiry found the virtual learning environment to be a safe environment in which they were free to take chances with their decision-making opportunities, which added to their motivation to engage with the environment.

### **Professional Learning within a Virtual Learning Environment**

This section discusses the types of professional learning the design of a virtual learning environment should provide an adult learner, including professional experience and professional knowledge. Both professional experience and professional knowledge are important areas of professional learning, however, what is of most importance is the connection an adult learner makes between these two areas of professional learning. These will be discussed further below.

#### **Professional Experience**

Andragogy is based on the belief that adults are life, task or problem-orientated in their learning. They want to see how what they are learning will apply to their life, a task they need to perform, or a problem that needs solving. Further, the literature suggests that the skills that are acquired during engagement with a virtual learning environment can transfer to real-life situations (Aldrich, 2004; Doyle, 2002; Gatto, 1993; Jonassen, 2000) as the learning environment provides the learner with "practice of the behaviour he/she will be called upon to exhibit in reality" (Gatto, 1993:144). Furthermore, virtual learning environments aid in focusing the learner's attention on the problem, thereby eliminating distractions that occur in real-life, and allowing the user to escape the consequences of an ill-advised decision (Conrick, Dunne & Skinner, 1997:3). Thus a

virtual learning environment will be more effective if it uses real-life examples or situations that adult learners may encounter in their life or in their profession. Hence, the design of a virtual learning environment should be based upon real-life examples of professional practice. Similarly, this inquiry found that the majority of the adult learners found that by assuming the role of a professional and engaging in typical work-related scenarios, they were able to improve upon previous understanding and gain confidence in their ability to take on the role of a professional.

### **Professional Knowledge**

Researchers such as Reigeluth and Schwartz (1989) and Breuer and Kummer (1990) argue that virtual learning environments enable learners to master cognitive processing skills by allowing them to apply the theory of their training within a realistic environment. Further, Reeves and Herrington (2003:5) suggest that in learning environments that support knowledge construction, learners should be exposed to a variety of resources and have a choice in the resources they use and how they use them. The inclusion of support materials designed to inform and support the user is an important component in the design of a virtual learning environment as it aids the user in making connections between the theory and the practice of their field and works to extend the thinking processes of the user. Subsequently, these support materials give the user the opportunity to construct their own individual knowledge, depending on their prior experiences, comprehension and interpretation of the subject matter. Analysis of the data from the participating pre-service teachers suggests that having access to ‘theory’ via the support materials was an essential design aspect of the virtual learning environment as it enabled them to see clear links between particular scenarios/situations and related theories, and aided novice practitioners to understand professional terminology. Further, this inquiry found that virtual learning environments which engage the user in professional scenarios and purposeful activities focused on professional roles are also important in developing a user’s professional knowledge.

## **Connections between Professional Experience and Professional Knowledge (Reflection)**

Educational literature within the past 20 years has seen an ever-increasing allegiance to the notions of reflection, reflective teaching, and reflective practice (see for example, Brookfield, 1995b; Calderhead & Gates, 1993; Ferraro, 2000; Mayes, 2001). Furthermore, Herrington, Oliver and Reeves (2003:63) suggest that activities within a virtual learning environment, such as a simulation, need to enable learners to “reflect on their learning both individually and socially”. However, it must be noted that for many adult learners, reflection is not a natural process, but one that needs to be carefully scaffolded to help users stop, think, and articulate what is happening during key moments of the experience. Including a place for reflection within the design of the virtual learning environment with prompts and discussion points, which is consistently available (and is re-accessible at any time after the user has engaged with the environment), provides the users with the opportunity to *reflect-in-action*, *reflect-on-action* and *reflect on the reflection-in-action*, as suggested by Schön (1987). Furthermore, Mezirow (1991:6) states that, “reflective learning involves assessment or reassessment of assumptions”. As such, reflective learning activities can assist users to examine their bias and prior assumptions and make connections between the theory and their experience, and thus move them toward a new understanding of the information presented. Similarly, this inquiry found that the incorporation of a reflective space enabled a number of participants to reflect upon their current understanding, thus aiding them to create new understandings of their learning. However, it was found that there was a need to examine avenues for more social reflection during and after engagement with the environment. Overall, by utilising a virtual learning environment, an adult learner is able to reflect on learning activities and/or assume the role of a different character within a scenario, which may ultimately cause them to re-evaluate previously-learned information or patterns.



## **Implementation of the Virtual Learning Environment in Adult Education**

The data analysis and literature has recommended a number of implementation strategies the educator should consider when using virtual learning environments with adult learners: adult learners often need to understand the purpose of the learning situation; the timing of the learning situation needs to coincide with the learning needs of the adult learner; and the learning framework needs to be flexible and allow for the varying needs of the adult learner. These strategies are explored further below.

### **Defined Purpose**

Adults will commit to learning if and when the learning goals are considered realistic and important to them (Speck, 1996:36). When using a virtual learning environment, the facilitator should make clear the purpose of the learning experience and how it relates to the learners' needs and future goals. Consideration should also be given as to when participants engage with the virtual learning environment within the degree structure. Furthermore, the users must feel that engaging with the virtual learning environment will fulfil a worthwhile purpose. It is important to note that the same virtual learning environment can be used for different purposes provided the task is carefully scaffolded and embedded within the other learning contexts. The findings of the inquiry concur with the work of Speck (1996), as many of the participants found engagement with the virtual learning environment advantageous as they could see that their engagement with the virtual learning environment could help them to make strong connections between their current learning and future profession. Holding a preliminary discussion about what the virtual learning environment has to offer is likely to be an effective way of introducing a virtual learning environment to adult learners. This was implemented during this inquiry. Further, findings revealed that the opportunity to deconstruct learning at the conclusion of engagement is important, as it allows for a review of the users' learning goals in regard to their experience with the environment.

## **Timing of Engagement**

Knowles, Holton and Swanson (1998) suggest that the timing of particular learning tasks should coincide with the learner's need to learn. Thus a virtual learning activity should be scheduled when the learner believes that as a result of using the virtual learning environment he/she is likely to acquire knowledge and skills that will be useful for their future professional role. In contrast, Merriam and Caffarella (1999:330) propose that an individual's personal development into readiness "is both inherent in and an outcome of the process" of learning. Based on this account, an adult learner's readiness to learn is a developmental process that depends on the adults' exposure to real-life situations that force them to act and learn. Taking into consideration both of these contrasting views, the timing of engagement with a virtual learning environment can be at anytime so long as the virtual learning environment caters to the different learning stages of the adult learners. Similarly, this inquiry found that the timing of engagement with the virtual learning environment is not a significant decision, as the more novice learners utilised an exploratory approach, and the advanced learners adopted a more in-depth approach when engaging with the environment. Furthermore, having the virtual learning environment available online reinforces its value as it is a resource that is re-accessible at anytime, from anywhere (via internet connection).

## **Flexible Implementation**

The design of a virtual learning environment should include opportunities for adult learners to apply their knowledge and experience in different ways. For example, individual engagement with the unfolding story presented in ClassSim may suit the learning requirements of some adult learners; however individual or group reflective activities that call upon the knowledge of group members are also examples of the type of learning activities that may make use of already-acquired expertise. Thus, forming a community of learners in which the adults discuss their learning in regard to the scenarios presented within the virtual learning environment may help broaden their understanding of an issue/event and their own learning. This can be done both virtually (online forum) or in real-life (face-to-face).

A major advantage of this inquiry was that the virtual learning environment was situated within a physical learning environment (a university). This made it easier for the learners to develop a face-to-face community. Although the adults in this inquiry engaged with the virtual learning environment individually (which met the needs of many of the participants), data analysis suggests that some informal group discussions occurred among learners during and after engagement. However, more formal group discussions may have provided the learners with an additional avenue to develop understanding. Therefore it is suggested that future implementation of virtual learning environments should allow for both individual engagement and group discussion.

## **Implications of Research**

This inquiry highlights the significant potential of virtual learning environments, such as ClassSim, for adult learners in addition to contributing knowledge to the field of andragogy and virtual learning environments within teacher education. This inquiry has also identified some important considerations for the development of professional identity. The next section considers these key findings further and presents some implications that emerged.

### **Implications for the Theory of Andragogy**

Knowles' (1980) theory of andragogy emphasised that adults are self-directed and expect to take responsibility for decisions. The five principles of andragogy are undoubtedly important to adult learning theory. However adult educators need to ask and reflect upon how these help inform and direct the design of learning experiences for an adult learner. Andragogy suggests that instruction for adults needs to focus more on the process and less on the content being taught via strategies such as case studies, role-playing, simulations, and self-evaluation. Adult learners are acknowledged as self-directed; therefore instruction should allow learners to discover things for themselves, providing guidance and help when mistakes are made. This inquiry challenged these

understandings with the promotion of the need to carefully define the purpose and context within which the learner engages with a virtual learning environment.

As Kirschner, Sweller and Clark (2006) argue, turning learners loose in a virtual learning environment, no matter how well designed, is a poor instructional strategy. Too many interventions naïvely assume that students will learn if they engage in ‘authentic’ practices of experts in a domain; forgetting that what experts do and how experts learned to do what they do are not necessarily synonymous. Therefore, guidance is needed to ensure that the learner avoids wandering aimlessly in a stimulating and rich digital environment. This inquiry suggests that such guidance can come about through an introductory discussion about what the virtual learning environment has to offer, highlighting the purpose of the learning experience and how it relates to the learners’ needs and future goals, however more research is required to explore this further.

This inquiry has also highlighted a number of important learning design principles an adult educator should take into consideration when designing and implementing learning experiences for adult learners. While these overlap with the andragogical principles as recommended by Knowles (1984), they also build upon these principles by suggesting additional areas an educator should consider when designing learning experiences for adults. These include:

1. The learning experiences must have relevance to their profession;
2. The purpose of the learning experience should be made clear;
3. Flexible structure and support catering for differing learning stages/styles should be integrated into the learning experience;
4. The learning experience should include feedback and other motivational methods;
5. The adult’s previous experience should be drawn upon (when possible) during learning experiences;
6. The inclusion of ‘theory’ alongside practical scenarios will aid the learner in making connections between the theory of their profession and what this may look like in practice, which in turn can aid a developing professional identity; and
7. Self-reflection should be promoted.

Examination of these principles in connection with other virtual learning environments will further explicate these.

### **Implications for Virtual Learning Environments (Beyond ClassSim and into Other Contexts)**

This inquiry has highlighted a number of implications for the design of virtual learning environments, which have been discussed in previous sections. In summary, this inquiry found that there are two important aspects one must consider when designing and developing a virtual learning environment in pre-service teacher education, and in other contexts. These include:

1. Learner engagement with the virtual learning environment provides opportunities to enhance their knowledge and experience. Such opportunities need to be designed as follows:
  - a. The learning experiences provided should be relevant to the learner's profession;
  - b. The learning experience should be embedded within a context that focuses on carefully planned outcomes;
  - c. Create support structures that facilitate self-directed learning (i.e. branching opportunities, support materials, and multimedia material to assist people with various learning styles. All of these can be used to enable learners to follow a path of learning that most appropriately suits their learning needs.); and
  - d. Include feedback and other motivational tools to encourage engagement and further learning.
2. The quality of the professional learning experiences provided by the virtual learning environment. Such experiences need to be designed as follows:
  - a. The learning experience should respond to a professional scenario;
  - b. The learning experience should be based on examples of professional practice (real-life situations that learners may encounter in their profession);

- c. The inclusion of multi-modal support material to give the learners the opportunity to construct individual knowledge. The nature of this knowledge depends on their prior experience, comprehension and interpretation of the subject matter; and
- d. The incorporation of a reflective space to enable learners to reflect personally upon their current understanding. This aids them to create new understandings of their learning, with scope for collective reflection with peers.

### **Implications for Linking Theory to Practice and the Development of Professional Identity**

Achieving an appropriate balance between the theoretical and practical components of teacher education is one of the most important challenges currently facing those involved in the design, delivery and accreditation of teacher education (CDEST, 2002; Education & Training Committee, 2005; House of Representatives Standing Committee on Education and Vocational Training, 2007; MACQT, 1998; NSW/ACT Independent Education Union, 2000; Ramsey, 2000). As such, the connections pre-service teachers make between theory and practice was a major focus of this inquiry. Issues associated with theory-to-practice connections were examined in chapters one and two of this thesis, formed an important part of the theoretical frame (andragogy), and was a constant consideration throughout the analysis of the data. The literature suggests that the skills that are acquired during engagement with a virtual learning environment can transfer to real-life situations. Thus, virtual learning environments have the potential to provide a supportive environment in which users can explore possible scenarios using the theory of their training in practical situations and construct their own understanding of the profession through the virtual experience. Further, the literature suggests that a philosophy of reflective practice will help learners articulate the theory-to-practice relationship and thus build stronger connections between the theory of a profession and the practicalities of the profession. As such a reflective space within the virtual learning environment can enable users to reflect upon scenarios in light of the theories of their training and thereby better understand their profession as a whole. Thus, learners who

engage with virtual learning environment may be better equipped to transfer the knowledge and skills they acquired during their training to a real life situation.

Professional identity was also a focus of this inquiry. Professional identity was examined in the review of the literature in chapter two of this thesis, was part of the andragogy theoretical frame, and appeared as a constant consideration in the analysis of data. It can be surmised from the literature reviewed that, although there is not one agreed-upon theory on how professional identity is developed nor how it progresses within a learner, professional identity is an ongoing process that involves the interpretation and reinterpretation of experiences. Furthermore the literature suggests that a teachers' professional identity can be supported via school-based experiences, mentoring, and an understanding of the links between the theory of teacher education and practice. Thus, it was found that virtual learning experiences can supplement the usual on-campus theory and in-school field experiences by providing relevant scenarios alongside relevant theory, thus enhancing a learner's understanding of professional concepts and by providing additional practical experience to the learner. Further, this inquiry highlighted the importance of a strong theory-to-practice connection in the development of a professional identity, which is explored via reflection.

The implications discussed above may be due to the nature of this inquiry, as the researcher was primarily concerned with how pre-service teachers made use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experience, rather than focusing solely on the professional learning of a pre-service teacher in regards to the development of their professional identity and how they made connections between theory and practice in general.

Overall, this inquiry has highlighted a number of important implications for the design of virtual learning environments (in pre-service teacher education and other context), in regard to the users' connection between theory and practice, and the development of the users' emergent professional development. These include:

1. Relevant professional scenarios;

2. Links to support materials, thereby providing users with relevant theories alongside professional scenarios; and
3. The incorporation of a space for reflection. The process of reflection was emphasised as a major contributing factor in establishing and developing a professional identity in learners, as reflective activities can assist users in examining their learning and make connections between theory and their experiences, thereby move them toward a new understanding and cause them to re-evaluate already-learned information.

### **Implications from the Inquiry Methodology**

The purpose of this inquiry was to investigate how pre-service teachers made use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experiences. A qualitative research design was utilised as it allowed for an in-depth comparison of the two cohorts of pre-service teachers. As such a recommendation for future research is to employ a range of quantitative methods in a similar study, thus explicitly measuring the learning of pre-service teachers before and after engaging with the virtual learning environment. This type of scientific measure may provide a broader perspective to the findings as they relate to different paradigms.

The theory of andragogy was chosen as the theoretical frame of this inquiry as it provided a framework in which the learning of the pre-service teacher participants could be reviewed and propositions made about how and why they learnt this new information. However, a limitation of andragogy is that it idealises adult learners, suggesting that when they enter any learning situation, their main goal is to maximise their learning experience. However, adult learners are human and are thus fallible to life pressures that may impact upon their engagement. Therefore, a recommendation for future research is to examine the self-motivation strategies of adult learners when immersed in a virtual learning environment.



## Conclusion

This inquiry was designed to investigate how pre-service teachers make use of a virtual learning environment provided by an online simulation (ClassSim) to link knowledge from university coursework with field experience, and in particular, if and how experience with an online simulation contributed to the development of pre-service teachers' emerging professional identity. In order to examine this in detail a qualitative comparative case study approach was used to investigate a virtual learning environment developed for pre-service teacher education.

A review of the literature identified a number of limitations concerning the current pre-service teacher education model, including the quality of field experience, the transferability of university coursework and the lack of connection between the theory of pre-service education and practical experience. As a result of these identified limitations it has been strongly suggested that alternative approaches to pre-service teacher education need to be investigated. Furthermore, the potential of a virtual learning environment such as ClassSim has been identified within this research as a possible alternate approach to support and extend upon the usual on-campus theory and in-school field experience, thereby providing real-life scenarios alongside relevant theory thus enhancing a learner's understanding of professional concepts and providing additional practical experience to the learner.

This inquiry focused on two cohorts of pre-service teachers enrolled in a Bachelor of Teaching (both first and third-year) at the University of Wollongong. This inquiry was not intended to be an exhaustive investigation on the use of virtual learning environments to support pre-service teachers; rather this inquiry aimed to provide an in-depth comparative investigation on the use of a classroom simulation to support the learning of two groups of pre-service teachers at different stages of their learning and to build upon the current theory of andragogy in relation to virtual learning environments.

Overall, reasons for the use of virtual learning environments include flexibility and the ability of learners to engage with the environment anytime, anywhere, and at their own

pace. To adapt to the needs of adult learners, a virtual learning environment designer should make its design interactive, learner-centred and able to facilitate self-direction in learners. Furthermore, the inclusion of practical real-life scenarios in conjunction with relevant learning/teaching theories is essential if a user is to develop an understanding of the theory-to-practice connection and begin to develop a professional identity.

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# Appendices

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## Appendix A - Examples of Medical Simulations

Medical Simulations		
Simulation	Study	Findings
<p>MIST (minimally invasive surgical trainer). Interface is based upon modified laparoscopic instruments and is translated into real time 3D computer graphics that accurately track and represent the movements of the instruments within a virtual operating volume. Tasks can be programmed to deliver varying degrees of difficulty.</p>	<p>In Madan and Frantzides' (2007) study, a randomized control trial involving sixty-five preclinical medical students with no prior operative experience was performed. The students were grouped according to four training methods: virtual reality training, inanimate box training, a combination of both, and no training (control). The pre- and post training scores for four skills in the porcine laboratory were the metrics chosen for this study.</p>	<p>There were no differences among any of the pre-training scores (<math>p &gt; 0.05</math>). The post training times differed between the four groups. Post hoc analyses showed statistically significant differences (<math>p &lt; 0.05</math>) between the participants trained with both trainers and the control subjects. MIST leads to better laparoscopic skill acquisition than either training method alone or no training at all.</p>
<p>Human Patient Simulator (HPS) called Simulab. The Simulab Trauma Torso is a life sized human torso with thoracic and abdominal cavities and a simulated neck/trachea for teaching chest tube insertion, pericardiocentesis, peritoneal lavage, and tracheostomy.</p>	<p>Block, Lottenberg, Flint, Jakobsen and Liebnitzky's (2002) study looked at the incorporation of human patient simulators (HPSs) in an Advanced Trauma Life Support (ATLS) course. The use of HPSs was trialled as an alternative to the use of animal models. Fourteen participants in an ATLS provider course completed the surgical skill stations and an experimental station using the Simulab Trauma Man HPS. After completion of the stations the students were asked to complete a 13-point satisfaction survey using a modified Likert scale.</p>	<p>HPS is superior to the animal model in teaching surgical airways and for management of Pneumothorax. As the Simulab Trauma Torso is a realistic anatomic model with modest physiologic responses, it was concluded that its simplicity allowed for a cost effective realistic model that may function as an alternative to animal or cadaver models. Thus, this HPS was found to have great potential in the training of surgical students.</p>

Simulation of anaesthesiology and critical care. This simulation is a screen-based anesthesia simulator in which users respond to scenario-based problems.	Doyle's (2002) research into the effectiveness of simulation-based training in anaesthesiology and critical care utilised Kirkpatrick's four levels of evaluation. The Kirkpatrick model aims to measure participant reaction, learning, behaviour, and results.	"Residents who managed anesthetic problems using a screen-based anesthesia simulator handled the emergencies in a mannequin-based anaesthesia simulator better than residents who were asked to study a handout covering the same problems" (Doyle, 2002:11).
Vitu@l Consult@tion was created using multimedia data, including medical imagery or photographs and body sounds to simulate the physical examination, thus allowing medical students to have a more realistic representation of the patient's problem. Vitu@l Consult@tion is also equipped with an electronic notepad that allows the tutor to assess and send feedback. It also allows information to be shared and compares physicians' notes.	Medélez Ortega, Burgun and Le Beux's (2003) study tested and evaluated Vitu@l Consult@tion with voluntary learning groups with the purpose of making improvements to the design of the program. The criteria measured during this evaluation were the users' satisfaction, usability, user-friendly interface, participation and communication.	Findings were positive in regard to all criteria with motivation and communication delays identified as areas needing some improvements. Thus, the findings suggest that the Vitu@l Consult@tion simulation is an effective addition to medical education.

## Appendix B - Examples of Aviation Simulations

Aviation Simulations		
Simulation	Study	Findings
Microsoft Flight Simulator (v.4.0) personal computer game. The program incorporated a single channel, colour visual scene display, utilising a keyboard for the command functions. The program allows for training in straight and level and coordinated turns (not takeoffs and landings).	In Dennis and Harris' (1998) study the student pilots were trained in straight and level and coordinated turns in the device for one hour. Following training, the student pilots were evaluated in a small, single-engine training aircraft.	Students who had received training with the Microsoft Flight Simulator performed significantly better in the aircraft than students who had not received the training. The findings however noted that because the simulator utilised simple keyboard commands, the perceptual-motor skills normally associated with visual flight could not be effectively trained on such a simulation.
Inert helicopter simulator verses an agile helicopter simulator. Both helicopter simulators were designed to train pilots in maintaining stable helicopter positioning and orientation, however the agile helicopter simulator utilises a MPI Motion Simulator as it is equipped with a realistic 1:1 motion representation.	The study by Nusseck, Teufel, Nieuwenhuizen and Bülthoff (2008) undertook a quasi-transfer design focusing on the ability of flight-naïve participants to successfully acquire and transfer the skills required to perform lateral sidestep hover manoeuvres in a helicopter simulation.	The amount of training required to stabilise either an agile or an inert helicopter dynamic did not differ. Further, it was found that there was a positive transfer effect for the acquired skills from the agile to the inert dynamics, but not from the inert to the agile dynamics. The findings also suggested that there was no transfer of skills from the inert to the agile simulator.

## Appendix C - Examples of Military Simulations

Military Simulations		
Simulation	Study	Findings
Simulation and Modelling for Acquisition, Requirements and Training (SMART) TACOPS - a commercial clone of 'Janus' (a non-commercial military simulation) SIMNET	Whilst many governments make use of simulations, both individually and collaboratively, little is known about it outside professional circles, as a result empirical research is rarely published. Some published result can be found in Macedonia (2002), Pike & Wansbury (2003) and Hieb & Wallace (2003).	
SimuLearn's Virtual Leader. Virtual Leader is a commercially available screen-based computer game that can be tailored to meet the needs of the user. The simulation can be used to encourage the user to become more agreeable or assertive and/or display more or less respect for authority.	The Independent Research from Corporate, Academic, and Military Institutions conducted a case study of twenty six cadets at the United States Military Academy in 2006. The participants were randomly assigned to either the control group, which consisted of a series of Army leadership-related interactive case studies, or the experimental group, which used SimuLearn's Virtual Leader. A pre-post instruction survey was used to measure their preference for leadership styles, and the ability to apply the right leadership style to the right situation (the 'right' answer was determined by seasoned military officers).	Participants who engaged with the Virtual Leader simulation reported an increased comfort with and the use of alternative leadership styles over the participants who engaged in the case studies. Overall, the study's findings supported the hypothesis that the simulation method increases the ability to correctly apply theory taught within a program of instruction compared to case studies.

## Appendix D - Examples of Business Simulations

Business Simulations		
Simulation	Study	Study
Performance management simulation. The students map human resources of a typical insurance company; analyse, classify and interpret multiple assessment data; and discuss operational decisions to promote achievement of strategic goals.	In Rachman-Moore and Kenett's (2006) study the participants engaged with the simulation for five weeks (during class) then completed a number of set tasks, then completed a feedback form. The feedback form included both open and closed questions regarding the simulation's contribution to student learning using the 5-point Likert scale.	Through engagement with the simulation the students obtained an increased understanding of the implementation of performance management, in particular it provided the students with tools and knowledge regarding the assessment of individual employee performance.
A management simulation designed to aid in the user's understanding of business strategy and policy course. The simulation enabled the users to engage with decision-making, strategy formulation, financial management, accounting principles and policy formulation.	Betts and Knaus (2006) investigated students' perceptions of the purpose and effectiveness of a management simulation in a college of business. They surveyed and held open discussions with fifty-four students enrolled in a capstone business policy and strategy course. The survey asked about learning objectives, learning effectiveness and how the simulation compared to other methods of learning.	"The students reported to have learned about decision-making, strategy development and group dynamics - all positive learning outcomes. They also experienced complex decision-making, saw the effects of their decisions and worked with other students" (Betts & Knaus, 2006:6).

## Appendix E - Information Session

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### **Introduce Myself**

Hi my name is Lisa. Four years ago I was just like you, sitting in this lecture hall with my friends, being overwhelmed by my new uni life and trying to find a balance between work, study and a social life. After I finished my Bachelor of Teaching (Primary) in 2003 and my Bachelor of Education (Honours) in 2005, and have decided to continue my study and do my PhD.

### **Introduce Simulation**

During my studies I was introduced to a classroom simulation aimed at giving pre-service teachers some extra practical experience, without any face-to-face time with children. The simulation works on the same principles as such simulations as 'SIM city' and 'The SIMs', in which the user manipulates a simulated environment and deals with all the consequences of their decisions. The classroom simulation however, allows the user to take on the role of a kindergarten teacher in a simulated classroom. The user then makes decisions about organising the lesson, classroom management and responses to individual students. As part of this subject, you will explore this program and gain an idea of what it's like to be a teacher, having to track student progress and how to plan, justify and reflect upon the decisions made throughout the lesson.

### **Introduce project**

The title of my project is 'Making links between university knowledge and field experience: An investigation into pre-service teacher learning experiences through an online simulation.' I know what you're thinking ... 'What?' What I'm trying to do is find out the simulation helps you to connect what you learn at uni to, how to teach in an actual classroom.

### **What participation involves**

What does this mean to you? Well ... As part of this subject you will use the simulation over a period of two weeks and will reflect on your decisions in an electronic journal.



Because you will already be using the simulation in class, and completing your journal entries, the only thing you will need to do is allow me to view your responses and have a short interview with me after you use the simulation and after your field experience (at the end of this session). And if you do change your mind you can withdraw at anytime without penalty.

### **Conclusion**

This project has become so important to me. I've spent so many hours thinking about it that it has become a large part of my life. I really want it to be a success. For this to happen I need your help. The benefits to you, as a participant are rewarding. You will gain a better understanding of your beliefs as a beginning teacher and the consequences of your decisions as a classroom teacher. You never know, in a few years you might be standing here asking for volunteers to help you. So before you hand back those surveys tick YES, I would like to be involved in research on this topic; I really need your help. Thanks.

## Appendix F – Demographical Survey (first year students)

University of Wollongong



### DEMOGRAPHICAL SURVEY

Tel (02) 42213571

E-mail [bferry@uow.edu.au](mailto:bferry@uow.edu.au)

**FIRST NAME:** \_\_\_\_\_ **SEX:** Male Female

**AGE:** 17 - 19 20 - 22 23 - 25 26+

**EDUCATIONAL BACKGROUND** (highest level achieved):

*(Please circle the most applicable)*

High School TAFE Tertiary Other (Please specify) \_\_\_\_\_

**AVERAGE MARK (SCHOOL/TAFE):**

*(Please circle the most applicable)*

85%+ 75-84% 65-74% 50-64% <49%

**PREVIOUS EXPERIENCES WITH CHILDREN:**

*(Please circle)*

I have siblings/other young family members Yes No

I have children of my own Yes No

I'm a parent helper in my child's class Yes No

I have had work experience (high school) in a primary class Yes No

A family member is a teacher and I help out in his/her class Yes No

I'm a tutor (1:1) Yes No

I work with children as swim teacher/karate instructor/

Scout leader/church group leader/etc Yes No

Other (please specify) \_\_\_\_\_

**ARE YOU INTERESTED IN BECOMING INVOLVED IN A RESEARCH PROJECT USING CLASSSIM?**

*(Please circle)*

Yes

No

If yes, what is your uni email address? \_\_\_\_\_@uow.edu.au

OR other email address? \_\_\_\_\_

**Thanks for your help ☺**

## Appendix G – Demographic Survey (third year students)

University of Wollongong



### DEMOGRAPHICAL SURVEY

Tel (02) 42213571

E-mail [bferry@uow.edu.au](mailto:bferry@uow.edu.au)

**FIRST NAME:** \_\_\_\_\_ **SEX:** Male Female

**AGE:** 17 - 19 20 - 22 23 - 25 26+

**EDUCATIONAL BACKGROUND** (highest level achieved):

*(Please circle the most applicable)*

High School TAFE Tertiary Other (Please specify) \_\_\_\_\_

**AVERAGE MARK (UNIVERSITY):**

*(Please circle the most applicable)*

HD D C P F

**SELF REPORTED RATING OF PREVIOUS FIELD EXPERIENCE:**

*(Please circle the most applicable number)*

Overall experience during previous field experiences

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

Supervising teacher support

Poor	Fair	Average	Good	Excellent
1	2	3	4	5

**ARE YOU INTERESTED IN BECOMING INVOLVED IN A RESEARCH PROJECT USING CLASSSIM?**

*(Please circle)*

Yes

No

If yes, what is your uni email address? \_\_\_\_\_@uow.edu.au

OR other email address? \_\_\_\_\_

**Thanks for your help ☺**

## Appendix H – Selection Matrix (first year students)

		Previous Experience with Children				
		No experience	Family	1:1 tutoring	Helper in Classroom	Teacher/leader out of classroom
Average Mark Achieved	85% +		<b>F2</b> , M3, M4, M5	F9	<b>F11</b> , F12, F13, F14,	<b>F19</b> , F20
	75-84%	M1	F3, F4	<b>F10</b>	F15	<b>F21</b> , F22, F23, F24, F25, F26, F27, F28, F29, <b>M12</b>
	65-74%	F1, <b>M2</b>	F5, F6, F7, <b>M6</b> , M7, M8	M10	F16, M11	F30, F31, F32, M13
	50-64%		<b>F8</b> , M9		<b>F17</b> , F18	F33
	<49%					

**Key:**

F = Female (n = 33)

M = Male (n = 13)

**Bold** = Participants selected to represent first year cohort (n=10)

## Appendix I – Selection Matrix (third year students)

		Experience during Previous Field Experiences				
		Negative	Semi-negative	Average	Semi-positive	Positive
Average Mark Achieved	85%+		<b>F1</b>	F5	<b>F7</b> , F8, F9, M4	<b>F15</b> , F16
	75-84%		F2, F3, M1	<b>M3</b>	F10, F11, F12, F13, <b>M5</b> , M6, M7	<b>F17</b> , M8
	65-74%		F4, <b>M2</b>		<b>F14</b>	<b>F18</b> , F19, F20, <b>F21</b>
	50-64%			F6		
	<49%					

**Key:**

F = Female (n = 21)

M = Male (n = 8)

**Bold** = Participants selected to represent third year cohort (n = 10)

***Bold Italics*** = Participants who withdrew from study before data collection commenced (n=3)

## Appendix J – Observation Guide

### Research Questions:

How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?

- What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?
- In what ways can the virtual environment of ClassSim support the principles of adult learning?
- In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?

### What to look for:

1. Did they access any of the ClassSim's embedded thinking tools (TS, Updates & Support Material)? When did they use them?
2. Do participants access ClassSim's embedded cognitive tools (TS, Updates & Support Material) to gain further understanding about teaching/learning?

Time	Observations	Notes

## Appendix K – Pilot Interview of Participants after Engaging with ClassSim

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1. How old are you? What sort of education have you had? What sort of experiences have you had with children (*use the participants' demographic information to individualise question*)?
2. When you used ClassSim, what was your purpose?
3. In your Thinking Space you referred to (*insert major issues discussed in participants 'Thinking Space'*). How did this tool help you to make decisions and/or make links to your university studies/practical experiences? Did you look at the prompts? If so, how did they help scaffold your reflections?
4. Did you access the student updates/profiles/summaries while using ClassSim? In what way did their use add to your experience with ClassSim?
5. Were you able to make links to your university studies whilst accessing these tools? Can you explain this?
6. When you engaged with ClassSim you chose (*insert names of episodes*). Can you explain why you chose this episode structure?
7. Any other comments you would like to make?

## Appendix L – Interview of Participants after Engaging with ClassSim

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1. How old are you? What sort of education have you had? What sort of experiences have you had with children (*use the participants' demographic information to individualise question*)?
2. When you used ClassSim, what was your purpose? What did you learn from of this experience?
3. In your Thinking Space you referred to (*insert major issues discussed in participants 'Thinking Space'*). How did this tool help you to make decisions and/or make links to your university studies? Did you look at the prompts? If so, how did they help scaffold your reflections?
4. Did you access the student updates/profiles/summaries while using ClassSim? In what way did their use add to your experience with ClassSim?
5. Were you able to make links to your university studies whilst accessing these tools? Can you explain this?
6. When you engaged with ClassSim you chose (*insert names of episodes*). Can you explain why you chose this episode structure?
7. In your opinion, how has your experience with ClassSim added to your pre-service teacher training?
8. Any other comments you would like to make?



## **Appendix M – Interview of Participants after both Field Experiences and Engaging with ClassSim**

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1. When you used ClassSim, what was your purpose? What did you learn from of this experience?
2. What connections can you make between your field experience class and ClassSim?
  - i. Targeted students (Similar? Different? How?)
  - ii. Structure of the Literacy Block (Similar? Different? How?)
  - iii. Underpinnings of episodes (e.g. Modelling, Guided, Independent) (Similar? Different? How?)
  - iv. Classroom interruptions (e.g. School notices, Bathroom breaks, Unexpected visitors) (Similar? Different? How?)
  - v. The decisions made (e.g. Behaviour management, Catering for different needs, Classroom management) (Similar? Different? How?)
3. Were the terms/concepts/strategies in ClassSim (i.e. summaries and running time) similar to those used during your field experience and/or throughout your university coursework?
4. Do you think ClassSim has helped your pre-service teacher learning? How do you think it helped you? What aspects of ClassSim do you believe supported your learning?
5. What has ClassSim taught you about subject knowledge (fundamental concepts and principles), how students learn (principles of developmental and educational psychology), general pedagogical knowledge (Quality Teaching models) and how to teach within particular disciplines?
6. Any other comments you would like to make?

## Appendix N – Field Experience Reflections (artefacts)

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### **Response during Field Experience:**

*Respond to each question each day/week:*

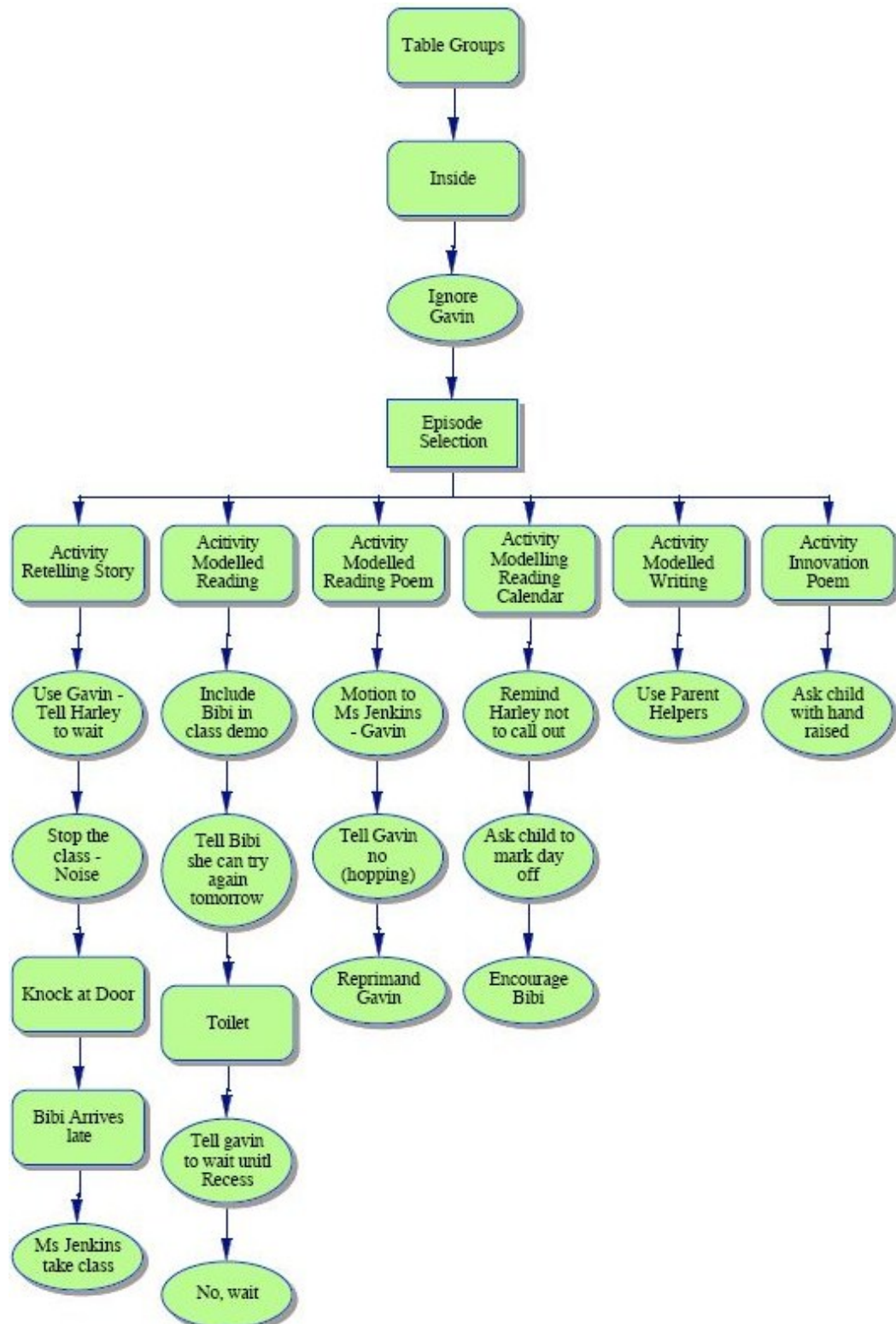
1. How were your experiences today/this week similar to your experience with the ClassSim scenarios and information?
2. What aspects of ClassSim were drawn upon today/this week? (e.g. decision-making opportunities, targeted-students updates – DET quality teaching behaviour management)
3. What has ClassSim taught you about the content you teach, how students learn, and how to teach students?

### **Response after Field Experience:**

*Respond to this question at the end of your field experience:*

How have you used ClassSim to better understand the role of a teacher? How has it contributed to your pre-service training?

## Appendix O – Sample History Trail



## Appendix P – Information Sheet

University of Wollongong



### PARTICIPANT INFORMATION SHEET

Tel (02) 42213571  
Fax (02) 42213892  
E-mail [bferry@uow.edu.au](mailto:bferry@uow.edu.au)

#### Research Project

*Making links between university knowledge and field experience: An investigation into pre-service teacher learning experiences through an online simulation.*

Researcher:	Lisa Carrington (B. Education Honours)	
Contact Details:	Phone: 042 118 9296	Email: <a href="mailto:lac67@uow.edu.au">lac67@uow.edu.au</a>
Supervisors:	Dr. Lisa Kervin	Contact Details: 4221 3968
	Prof. Brian Ferry	Contact Details: 4221 3571

The research project aims to investigate how a virtual learning environment of an online classroom simulation contributes to the learning of pre-service teachers focusing on the following issues:

How does ClassSim, a virtual online classroom simulation environment, contribute to pre-service teachers' learning about the work of a teacher?

- *What connections do pre-service teachers make between theory and practice as they reflect upon their teacher education course and field experiences as they engage with ClassSim?*
- *In what ways can the virtual environment of ClassSim support the principles of adult learning?*
- *In what ways can pre-service teacher engagement with ClassSim contribute to the development of their professional identity?*

Before any research is undertaken, all students in 'Professional Development' will complete a demographic survey and state whether or not they will be interested in volunteering to participate in the research. This survey will also be used to obtain

general demographic information of the participants and the overall cohort of students enrolled in 'Professional Development'. Of those wishing to participate in the research project a representative sample of five to ten students will be selected to participate in the research via a selection matrix.

Participants will use the simulation as part of their normal tutorial classes and will use an electronic journal ('Thinking Space') to record all teaching decisions made throughout the simulation. This journal will also be used to reflect upon their use of the classroom simulation in regard to any previous and future field experiences in a classroom. The data collected from the participants' 'Thinking Space' will be used to gain insights into the participants' understanding of the teaching of literacy, behaviour management, classroom organisation, and any connections they make between their university coursework and experiences. The participants will also give the researcher access to their field experience reflections completed throughout their field experience in their designated class. These reflections will give the researcher a greater understanding of the participants' experiences during field experience and what, if any, connections are made between their experiences with ClassSim, their university coursework and their practical experiences.

The participants will have a slight increase in workload, as they will be involved in two 30-minute interviews (after use of ClassSim and after field experience). Each individual interview will last approximately 30 mins and will be audio-taped. This increase in workload will support participants during their current studies allowing them to reflect upon their professional development during their studies.

The identity of participants in this research will be kept confidential, and no participant will be identifiable in any published data.

If a participant has any enquiries about the research he/she can contact Lisa Carrington (0421189296), Lisa Kervin (4221 3968), or Brian Ferry (4221 3571). If the participant has any concerns or complaints regarding the way the research is or has been conducted he/she can contact the Ethics Officer, Human Research Ethics Committee, Office of Research on 4221 4457.

## Appendix Q – Consent Form

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University of Wollongong



### CONSENT FORM

Tel (02) 42213571  
E-mail [bferry@uow.edu.au](mailto:bferry@uow.edu.au)

*Making links between university knowledge and field experience: An investigation into pre-service teacher learning experiences through an online simulation.*

Researcher: Lisa Carrington

I have been given information about ‘*Making links between university knowledge and field experience: An investigation into pre-service teacher learning experiences through an online simulation*’ and discussed the research project with Lisa Carrington who is conducting this research as part of a Doctor of Philosophy degree supervised by Dr. Lisa Kervin and Prof. Brian Ferry in the Faculty of Education.

I understand that, if I consent to participate in this project I will be asked to use an online classroom simulation (ClassSim) to explore possible classroom scenarios as part of my usual course schedule. During this time I will be observed and an audio tape will be placed near me to record my interactions with my peers. I also understand that I will be required to participate in two individual interviews (after use of ClassSim and after my field experience). Each individual interview will last approximately 30 mins and will be audio-taped. I will also be asked to share my reflections (both ‘Thinking Space’ entries and field experience reflections).

I have been advised of the potential risks and burdens associated with this research, which include a possible slight increase in my workload during one semester of the

year, and have had an opportunity to ask Lisa any questions I may have about the research and my participation.

I understand that my participation in this research is voluntary. I am free to refuse to participate and I am free to withdraw from the research at any time. My refusal to participate or withdrawal of consent will not affect my relationship with the Faculty of Education or the University in any way. I also understand that the identity of all participants in this research will be kept confidential, and that no participant will be identifiable in any published data.

If I have enquiries about the research, I can contact Lisa Carrington (0421189296), Lisa Kervin (4221 3968), or Brian Ferry (4221 3571), or if I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on 4221 4457.

By signing below I am indicating my consent to participate in the research entitled '*Making links between university knowledge and field experience: An investigation into pre-service teacher learning experiences through an online simulation*', conducted by Lisa Carrington as it has been described to me in the information sheet and in discussion with Lisa. I understand that the data collected from my participation will be used for Lisa's thesis and may be used by Dr. Lisa Kervin and Prof. Brian Ferry in further research, and I consent for it to be used in this manner.

**Name (please print):**

**Signature:**

**Date:**

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.....

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## Appendix R – Audit Trail

Pilot study - First year pre-service participants (2006)

Name (pseudonym)	History Trail	Use of ClassSim (Observation)	Thinking Space (Artefacts)	1 <sup>st</sup> Interview
Scott	12/05	11/05	13/05	21/06
Nina	12/05	11/05	17/05	20/06
Chloe	12/05	11/05	23/05	20/06

First year pre-service participants (2007)

Name (pseudonym)	Document Analysis (subject outline) (DA)	Demographic Survey (S)	History Trail (HT)	Use of ClassSim (Observation) (O)	Thinking Space (Artefacts) (TS)	1 <sup>st</sup> Interview (I)	Field Experience Reflections (Artefacts) (FER)	2 <sup>nd</sup> Interview (I)
Kim	26/02	05/03	04/04	06/03	28/04	19/03	23/07	25/07
Leonie	26/02	05/03	04/04	06/03	09/03	20/03	11/06	23/07
Rachael	26/02	05/03	04/04	08/03	10/03	29/03	11/06	25/07
Sarah	26/02	05/03	04/04	08/03	09/03	27/03	11/06	26/07
Serena	26/02	05/03	04/04	08/03	12/03	23/03	14/06	25/07
Kellie	26/02	05/03	04/04	06/03	12/03	20/03	12/06	23/07
Jasmine	26/02	05/03	04/04	06/03	10/03	29/03	19/06	24/07
Daniel	26/02	05/03	04/04	08/03	16/03	20/03	14/06	23/07
Michael	26/02	05/03	04/04	08/03	15/03	22/03	19/06	24/07
Bruce	26/02	05/03	04/04	08/03	10/03	22/03	18/06	26/07

Third year pre-service participants (2007)

Name (pseudonym)	Document Analysis (subject outline) (DA)	Demographic Survey (S)	History Trail (HT)	Use of ClassSim (Observation) (O)	Thinking Space (Artefacts) (TS)	1 <sup>st</sup> Interview (I)	Field Experience Reflections (Artefacts) (FER)	2 <sup>nd</sup> Interview (I)
Mia	23/07	16/08	20/08	18/08	18/08	21/08	10/11	13/11
Lauren	23/07	16/08	20/08	18/08	19/08	22/08	09/11	16/11
Zoe	23/07	16/08	20/08	18/08	18/08	20/08	10/11	16/11
Isabella	23/07	16/08	20/08	18/08	30/08	20/08	11/11	12/11
Marie	23/07	16/08	20/08	18/08	30/08	20/08	11/11	13/11
Mark	23/07	16/08	20/08	18/08	09/09	24/08	12/11	13/11
Ross	23/07	16/08	20/08	18/08	21/08	22/08	10/11	16/11