TEACHERS MENTORED BY STUDENTS IN USING ICT

Submitted by

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STATEMENT OF AUTHORSHIP AND SOURCES

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

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All research procedures reported in the thesis received the approval of the relevant Ethics Committees.

Donna Gronn

ABSTRACT

Despite considerable expenditure by school systems on ICT in terms of hardware, software, and related professional development programs, the impact on classroom practice remains disappointing to many. Current models of teacher professional learning in ICT appear to have had minimal impact.

Based in the interpretative paradigm, this thesis describes the experience of the participants in a unique professional development program in which students in Grades 3 and 4 mentored teachers in their school in the use of ICT. The study was undertaken in two schools in Melbourne, Australia, and involved the professional development of teachers in the use of digital cameras and related software.

Following their initial training with the researcher in one school and a focus teacher in another, the children worked in pairs to conduct three semi-structured sessions with a teacher, mentoring them in the use of the technology. The children were also available to the teachers for further consultation or assistance. It was intended that the mentoring program would enhance teachers' knowledge of the technology and also their classroom practice. This thesis reports the benefits of student mentors in ICT as seen by teacher mentees involved in the project. In particular, the focus of this study is on the teachers' perceived effect of the student mentoring approach to professional development in relation to their skills and confidence with ICT, their classroom practice with ICT and their recognition of other values inherent in the program.

Data were collected throughout the project in the form of surveys, interviews, observations and student and teacher journals. Using NVivo, these data were analysed into themes to ascertain teachers' reported benefits of the program in relation to their skills, confidence and classroom practice with ICT.

Findings of the project included the improvement in teachers' skills and confidence and an impact on their thinking and practices with technology in the classroom. As well as these intended outcomes, teachers also reported a greater knowledge of their personal learning preferences, which influenced the way they saw the children's learning and therefore their classroom practice. Child mentors flourished in the mentoring relationships, showing their prowess in mentoring teachers with ICT, with several surprising their teachers with their capabilities. Overall, the teachers were very positive about the mentoring experience and the influence it had on their confidence, skills and classroom practice.

This study showed the potential impact of children as mentors of teachers in ICT, and offers a model for consideration by schools and school systems in the way in which they approach professional learning in ICT of their teachers.

DEDICATION

I dedicate this thesis to the many people who have encouraged and supported me throughout the journey:

My parents, Josie and Fred Fahey who have nurtured and supported my love of learning across the past 49 years.

My husband Andrew and our children Kat, Michael and Libby without whose love, encouragement and support this would not have been possible.

My supervisors, Doug Clarke and Marj Horne who encouraged me to begin this journey and have assisted and supported me along the way.

My friend, Geoff Romeo whose continual encouragement and assistance was invaluable.

All the children and pre-service teachers I have taught in the past 27 years in the hope of inspiring a love of learning that they will carry throughout their lives.

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CHAPTER 1

TEACHERS MENTORED BY STUDENTS IN USING ICT

1.1 CONTEXTUAL BACKGROUND

During the last 20 years, the amount of information and communication technologies (ICT) in Australian schools has increased substantially. For the specific example of computers in schools, programs have been established to ensure that the student to computer ratios continue to fall, that laptops are available for all teachers via programs such as the Victorian Education Department Teacher Laptop Program (Department of Education and Training: Victoria, 2002) and that specific software are readily available for educational use. There is an ever-growing variety of ICT available in schools, including continuing items such as calculators and computers, and the inclusion of ICT advances such as interactive whiteboards and ipods as they become available. Now film and media studies are integrated into the spectrum as well.

Specifically in terms of computers, according to the February 2007 Census of Computers in Victorian Schools data provided by the Department of Education and Early Childhood Development (DEECD), the curriculum computer to student ratio in Victorian Government schools was 1:3.54. Since 2002, this figure has varied between 4.17 and the current 3.54. The other statistic to note, due to the rapid changes in technology, is the percentage of computers in schools that are less than five years old. This percentage has fluctuated between 78% and 87% since 2002 (DEECD, 2007a).

Teachers have been under consistent pressure to incorporate the use of this ICT into their learning and teaching. They have been offered a broad range of professional development programs to improve their knowledge and skills with ICT and enable them to acquire an approach to teaching that utilises ICT effectively. Teacher professional learning has largely taken the following forms:
• on-site (at school) learning, which can be described as both formal (such as working in a project team, shadowing, mentoring) and informal activities such as a discussion about a school policy/process to build on understandings; and

- off-site (outside school) activities, which may include a conference or workshop, online training, a modular program conducted over a period of time or network activities (Department of Education and Training [DET], 2002).

Throughout this thesis professional learning is used to refer to teacher learning within their professional sphere. The focus is the teacher as learner. Professional development on the other hand refers to programs that are implemented to provide opportunities for professional learning to take place.

During the last 20 years, despite the increase of facilities and the large amount of professional development offered, there was still not apparent proportional use of ICT in classrooms across the state (DET, 2002). In some schools a range of computer skills and uses could be seen, however these occurrences were very patchy and certainly not proportional to the amount of money spent, on hardware, software and the professional development of staff in the pedagogy and skills required for their use in the last ten years.

Much of the hardware is unused in many schools, but many students are becoming computer literate in spite of the lack of ICT use in schools. A 2006 study based on a random sample of 1,606 Australian households, found that 79% of Australian households have a device for playing computer and video games, and Australians purchased nearly 12.5 million electronic games in 2006 (Brand, 2007). This is a large number given the population of approximately 20 million.

Twenty-first century students are playing with their *Nintendo*, *ibox*, *Playstation*, *wii* and other computer based games. They are at home on computers surfing the Internet for homework or just interesting facts, *Instant Messaging* their friends on *MSN* and updating their personal pages on *FaceBook*, *MySpace* etc. They are sending text messages to friends on their mobile phones. They are generally building skills and confidence with anything electronic to which they can gain access.

Due to the constant immersion in the digital technology with which they have grown up, many different terms are used to refer to the technological knowledge and capacities of children in schools. Terms such as *digital natives* (Cookson, 2004; Prensky, 2001), *net generation* (Tapscott, 1998, 2008), *iGeneration* (Irvine, 2004),

net generation (Oblinger & Oblinger, 2005; Tapscott, 1998), *computer generation* (Sandberg & Söderberg, 1997), and *generation now* (Gaddis, 2006), have all been used to describe the children who were born after the mid 1980s.

Different terms are used by different people, but the general community sees them as interchangeable. They are taken to describe children who have grown up immersed in the technologies they now take for granted. These children are at ease with this technology so perhaps they are the resource the education system should be looking at to assist in the professional development of teachers in the use of ICT in schools. This notion that children's confidence and expertise with ICT could be used to assist teachers in their skills and confidence with ICT is the essence of this study.

In an effort to increase the use of ICT in classrooms, an innovative model of professional development incorporating students as mentors for teachers in the use of ICT was developed by the author and trialled in two schools. For the purpose of this research the schools will be referred to as Mountaintop Primary School (Mountaintop) and Hillside Primary School (Hillside). The research reported in this thesis was a largely qualitative study of this innovative model of teacher professional development in ICT.

An initial pilot study, which investigated the possibility of using children as mentors to their teachers in the use of a new piece of software to the school, showed the effectiveness of a different relationship between teachers and students in their teaching and learning of ICT. This pilot study informed the development of this research. From the pilot study, a model of teacher professional learning emerged where the students in one class became proficient with a new piece of software and they in turn acted as mentors for the teachers in their school to develop their proficiency with the software.

The pilot study focused on one classroom of students and all staff members within the school. It indicated that children mentoring their teachers could make an important contribution to teacher professional learning, however there were a number of factors in the design that were not convenient for schools. The pilot study involved a model where the students in one class became proficient at using a new piece of

software and then provided the professional development to teachers by acting as mentors in a whole group computer laboratory session. This model of whole group professional development was not seen as sustainable in a school because it was generally not convenient to gather teachers together at one time due to their various other commitments.

It was decided to adapt the model by expanding it and opening it up to a longer, ongoing mentoring program. A more sustainable model within the school setting, one which looked at both hardware and software, was proposed. The new model described in this thesis encouraged mentors and their teachers to meet at a time convenient to them both. This allowed them to meet more frequently, particularly when they had a specific need, and also enabled more of an ongoing relationship. This study was conducted in two schools to discover the applicability of this model of professional development, and the effect it had, particularly on the knowledge, skills and confidence of the teachers involved, and subsequently, how it affected their classroom practice.

The research question was as follows:
What benefits of student mentors in ICT do teachers report? In particular what is the perceived effect of this approach on the teachers' skills, confidence and classroom practice with ICT?

1.2   SIGNIFICANCE

This research has potential significance to all groups and aspects of education from students to teachers, parents, principals and education systems. Children have the most to gain from the research, as any enhancement to teaching and learning within the system benefits children in the long run. If the implementation of this professional development model was successful, children would gain more confident and experienced teachers who could work with them to help them to acquire further knowledge and skills in all areas of the curriculum. Those children who were mentors within the program could gain much more. They could gain the confidence and skills to mentor adults in this unique situation. With that mentoring may come the added confidence that prospectively could flow into all they do in the school setting and beyond.

The teachers would benefit from a successful mentoring program. They would gain the skills and confidence to use ICT and to incorporate it into their learning and teaching. They would gain an added understanding of the children who mentor them and this would in turn influence their relationship with the children they teach. The teachers would gain knowledge of the power of mentoring in their own learning, but also in the learning of their students, colleagues and parent helpers in their classrooms.

This is significant to parents of these children as they would see the money they have put into the technological advancements in their children's schools being well used to the advantage of their children and their children's peers. In most homes, parents readily agree that their children know more about computers and new technologies than they do themselves (NCH & Tesco-Telecoms, 2006). They also realise that their children will need very strong ICT skills to thrive in the heavily ICT-centric workplace they will join eventually. The parents of the mentors too may see a significant change in their children's confidence, when the children realise they are valued for their contribution to the teacher's learning and therefore the advancement of ICT in their school.

Principals too may see such mentoring programs as significant as they would see their staff confidence grow as teachers realise the ease with which they can use ICT in their schools. They too would be pleased to see the hardware and software they have installed in their schools being used productively by more students and teachers, possibly for the first time.

Finally, the significance of this project cannot be understated for the Victorian State Government who have committed over $400,000,000 in ICT hardware funding to schools since 2001, as outlined in the literature review.

All of these stakeholders in the use of ICT in education have an interest in the success of a professional development model that can facilitate teachers' use of ICT in their classrooms with their students. The primary purpose of our education system is to develop the learning and understandings of the children. This project is of significance for children's learning in the long term if teachers improve their use of

ICT, but for the particular children in the project there are a number of possible related benefits as well. Although the topic of the benefits for the mentor children is interesting and could well be the focus of future research, this thesis focuses on the benefits for the teachers, recognising that this aspect will affect more children in the long run.

1.3 PURPOSE OF THE STUDY

The establishment of a professional development model, which is effective for ICT in schools and at a low cost, would have impact on two major issues for schools and systems. That is,

- the amount of money that has been spent on ICT resources and professional development to seemingly little effect; and
- the reluctance of many teachers to use computers, despite the availability of ICT professional development in Victoria.

The intent of this project was to use one of the largest low cost resources we have at our fingertips: our students. Of particular interest was the applicability of the child-to-teacher mentoring process and the effect it had particularly on the skills and confidence of the teachers involved, and how this in turn affected their classroom practice.

The purpose was not to evaluate the program, but to observe it and to interpret it through the participants' eyes. As a result of these observations and interpretations, it may be possible to answer the question: Is mentoring of teachers by their students a useful alternative, or could it be complementary to the current professional development of teachers in ICT?

From a personal viewpoint, this has been of interest to me as I have worked in the professional development of teachers in ICT for a number of years, and during this time I have noticed with pre-service teachers, with teachers working in the field and as a parent myself, that there is a lack of knowledge and skills with technology in the field of education.

Most schools have purchased a broad range of technologies, the latest large-scale purchases in Victoria being interactive whiteboards (Jones & Vincent, 2006). This year, the Australian Federal Government has also announced a "$1.2 billion Digital Education Revolution" which includes "new or upgraded information and communications technology (ICT) for secondary schools with students in Years 9 to 12" (Department of Education, Employment and Workplace Relations, 2008, parag. 3). Governments and schools talk of the amounts and varieties of technological items they possess. Fewer schools and systems talk of the uses of these technologies to enhance their students' learning.

Although students at university appear to be computer literate, from my experience as a lecturer in ICT, only a small percentage of them come to university actually literate enough to incorporate ICT into a classroom. Most university students are prepared to type an essay in a word processed document and use a webmail program to send emails, but when asked to present their findings in an electronic presentation, some are not even sure of the options available to them.

As previously stated, a small pilot study was completed, using Grade 5 students aged 10 to 11 years as mentors for the teachers in their school. This will be detailed further in Chapter 3, but it is pertinent to note here that both teachers and students benefited from the mentoring experience. There were positive outcomes in the areas of teacher confidence, skills, and use of technology in the classroom. This provided an impetus for ongoing research in this area.

1.4   ORGANISATION OF THE THESIS

This thesis is organised into seven chapters. In Chapter 1, the context of the study and its significance to the education community as a whole are introduced and the purpose of the research is outlined.

In Chapter 2, a review of relevant literature is presented with specific focus on technology in schools, adult learning, teacher professional development and mentoring.

In Chapter 3, the methodology is discussed placing the study within the interpretative paradigm. The related research methods are considered and the case study design

is expanded upon to reveal the study of an innovative ICT professional development model in which children mentor their teachers to improve skills and confidence with ICT.

In Chapter 4, the story of the project is told with a particular focus on two of the participating teachers, thus enabling the rich description of these cases to emerge.

In Chapter 5, the data analysis and perceived benefits of the mentoring are discussed with specific reference to the teachers' skills and confidence with ICT, their classroom practice with ICT, and their appreciation of other benefits implicit in the program.

In Chapter 6, the list of assumptions on which the development of the program was based and how it was adapted throughout the project to be more appropriate for a child-to-adult mentoring model are discussed. Each assumption appropriate to the child-to-adult mentoring model is elaborated.

In Chapter 7, the overall benefits of the program are discussed, with recommendations and implications for further research regarding ICT professional development, professional development in general, school leadership, teacher classroom practice in using children as mentors and selection of child mentors.

CHAPTER 2

LITERATURE REVIEW

Nothing could be more absurd than an experiment in which computers are placed in a classroom where nothing else is changed … computers serve best when they allow everything to change. (Papert, 1993, p.139)

2.1 BACKGROUND TO THE LITERATURE REVIEW

The focus of this study was on how teachers valued the assistance of student mentors in the development of their ICT knowledge, skills and confidence and what the impact was of this development on their classroom practice. The child-to-adult mentoring explored in this project was different from the usual forms of professional development, in which teachers were assisted by other teachers or outside experts in the area, to a role reversal situation where the children became the more experienced guides to the teachers. This alternative option for professional development was suggested due to the inconsistency of success in other professional development models with ICT, the potential of this approach as revealed in the pilot study, and the fact that this approach was yet to be fully explored in the literature.

This review is structured under the following headings: technology in schools; adult learning; teacher professional development; and mentoring. The discussion on technology includes consideration of government infrastructure and spending in this area, relevant government and education systems' policies, and findings from related studies that outline the types of use of technology in schools. The literature on computer-related aversion or phobia, seen in many adults and in particular teachers, is covered here as well.

Adult learning was pertinent because adults were the focus of the study. It was necessary to understand how adults learn, and to draw implications for general principles of learning which in turn informed the proposed mentoring model. Within the adult learning area, there was the more specific case of teacher professional

development. It was necessary to decide whether teacher professional development was different from other types of adult learning and if so, in what ways.

Mentoring was clearly of relevance because the mentoring relationship was at the heart of this research. In an educational setting it is usual to have an experienced adult as the mentor working with a normally younger inexperienced mentee (Shea, 1992). In the study that forms the basis of this thesis, the younger person was the mentor and the inexperienced, but older person the mentee. Clearly the usual power relationship was reversed in this context. This reversal of roles went beyond the normal understanding of school where the teacher is seen as the mentor of the students. As McCann and Radford (1993) aptly stated, "schools are places for student learning. It is only recently, however, that they have begun to be thought of as places for teachers' professional learning" (p. 25). In this study, a program was explored that reconceptualised the understanding of teachers' professional learning especially in the area of teachers learning technology.

2.2   TECHNOLOGY IN SCHOOLS

Technology, specifically computer technology, has been a part of Australian schools since the 1960s and is now a noticeable part of every school in the country. Although the use of technology has been shown to create a significant positive impact on improvement in student learning in a broad range of studies (BECTA, 2003; Butler, 2000; Clements, 1999, 2002; Edmonson, 2006; Fletcher, Parkhill & Fa'afoi, 2005; Gee, 2003; Ivers, 2003; Ivers & Barron, 2002; Johnstone, 2003; Mancabelli, 2007; Spender & Stewart, 2002; Thomson & De Bortoli, 2007; West & Graham, 2005) and teachers and researchers in the field regularly report in educational journals on the positive effects they see in their students' learning due to the use of technologies (Brown-Yoder, 2003; Donohoo, 2005; Fletcher & Brooks, 2006; Kolb, 2006; Levin, 2005; McEune, 2004; Steelman, 2005; Tuttle, 2005; Wahl & Duffield, 2006), the use of technology in schools is still under constant examination.

Many (Armstrong, & Casement, 2000; Buckenmeyer & Freitas, 2006; Cordes & Miller, 1999; Jamieson-Proctor, Burnett, Finger & Watson, 2006; Newhouse, 2002) are sceptical about impact, partly because pure research in the area of the value of technology to improvement in student learning is difficult to accomplish. As

Newhouse (2002) stated in his report for the Department of Education and Training (WA), *Measuring the Impact of ICT on Teaching and Learning*:

> While it would be convenient to be able to make a direct connection between the use of ICT and learning outcomes, most reputable educational researchers today would agree that there will never be a direct link because learning is mediated through the learning environment and ICT is only one element of that environment. Studies that have tried to identify this mediated impact of ICT on learning have found it impossible to entirely remove the effects of other elements of the learning environment. (p.16)

Educational value is not always about increased test scores, and there are reports (Gee, 2003; Steelman, 2005; Valcke et al., 2005) of improvement in areas of students' learning such as their ability to collaborate, apply critical thinking skills and to feel their work has meaning and that others value it. The educational value of these learning improvements cannot be measured by numbers alone. However there are more recent research studies that offer positive results when discussing the impact of a range of ICT implementations on student achievement. In 2007, the focus of a *Computers in the Schools Journal*, was evidence-based research on the impact of technology in education. The six articles in the edition relating to student learning all discuss the positive effect of ICT on student learning, though to differing degrees and across different items (LaMont-Johnson, 2007).

In the introduction to the edition, LaMont-Johnson and Maddux (2007) summed up the issue when they referred to the Knezek and Christensen (2007) article on the effect of technology-based programs on first- and second-grade reading achievement and they stated: "The bottom line in this study is that when teachers are properly trained and have the proper equipment and necessary support, technology does make a difference" (p. 5). The issue is not just the technology, but also the teachers and the support they receive.

From the studies above there appears to be a prima facie case that technology is advantageous to children's learning. Of course, the value of the technology, like any tool in a classroom, is based on the value of the teaching that places it in the classroom. Technology alone does not provide improvement to students' learning: technology needs to be surrounded by good pedagogy and teachers who understand

and value its use. It is not just about the technology, it is also about the quality of the teaching.

It is important to keep in mind Wang's (2006) comment: "technology can assist and enable learning if used appropriately, but it cannot cause learning" (p. 37). If technology in education is viewed in this way, then it is imperative that the teachers are conversant with its uses and have skills and confidence to include it in ways that are conducive to improved student learning.

In 2001, Zhao and Cziko stated that "while evidence of the educational benefits of technology abounds and investment in hardware and software has dramatically increased, relatively few teachers use technology regularly in their teaching and the impact of computers on existing curricula is still very limited" (p. 1). This was still true when this project began, and educational experts including government education departments have constantly been attempting to redress this issue. In 2008, the Australian Minister for Education, Julia Gillard when addressing the Australian Computers in Education Conference in Canberra, commented on the lack of use of technology in schools when she stated,

> while ICT has fundamentally reshaped whole industries, revolutionised production processes and generated massive improvements in productivity in our workplaces, our education systems have been slower in adapting … technology is still seen as something of an optional 'add-on' to the teaching process in the vast majority of Australian schools. Technology is not yet near the centre of our daily classroom practices. (Gillard, 2008, p. 2)

Minister Gillard spoke of the need for change just as many others have in the past. In his book, *The Children's Machine*, Papert (1993) talked of the need for change and how computers serve best when they allow everything to change. In a 2004 presentation in Sydney, Australia, Papert spoke of the need for education systems to encourage staff to experiment, not to use computers just as tools, but to use them as construction materials, to use them to build things rather than to use them just to gather information. He saw computers and technology as enabling people to "get engaged in activities and projects where you use mathematical thinking in a hard, rigorous way" (Papert, 2004, audio 37:10-37:27).

Like Papert, we should be using computers as an integral part of activities and projects which enable and encourage our students to think in a hard, rigorous way. Education sectors all around the world have been focusing on doing this, and in an attempt to enable schools to create opportunities to engage in these activities a large amount of money has been and continues to be invested.

2.2.1   The Victorian context

Given that the setting of this study was in Victorian primary schools, it was useful to begin the review of pertinent literature on the frequency and use of technology from the Victorian perspective. This review was situated in the 2006 introduction of the *Victorian Essential Learning Standards* (VELS) (VCAA, 2006), and the range of spending initiatives of the last ten years by the Victorian Department of Education.

VELS is structured with three core and interrelated Strands: Physical, Personal and Social Learning; Discipline-based Learning; and Interdisciplinary Learning. While the domain of Science for example was classified as a domain within a discipline-based strand, greater recognition was given to ICT as a domain within the Interdisciplinary Learning Strand. This strand was seen as identifying "a range of knowledge, skills and behaviours which cross disciplinary boundaries and are essential to ensuring students are prepared as active learners and problem-solvers for success at school and beyond" (p. xxx). The particular dimensions of focus for the ICT domain were: ICT for Visualising Thinking, ICT for Creating, and ICT for Communicating. Teachers were encouraged to determine collectively the extent to which these dimensions were addressed in their teaching and learning programs, and the school as a whole was expected to ensure appropriate coverage of the Standards across the relevant developmental levels. As stated on the Victorian Curriculum and Assessment Authority (VCAA) website, "ICT, as an interdisciplinary domain, focuses on providing students with tools to transform their learning and to enrich their learning environment" (VCAA, 2006, Introduction, para. 2).

Education systems all over the world have invested considerable amounts of money into hardware, software, infrastructure, and professional development for teachers. In Victoria alone, the education system including the Government, Catholic and Independent systems, as well as individual schools, have spent a large portion of their budgets setting up computer labs, computer pods and individual computers in

classrooms. The 1998 document *Learning Technologies in Victorian Schools* (DOE, 1998), led to a range of existing and new initiatives including hardware purchases by the statewide software licensing fund, Internet access, print and electronic resources, Navigator Schools and teacher professional development. Following this there was the rollout of the Notebooks for Teachers and Principals Program which began in 1998 (DET, 2002). From 2001 to 2007, specific commitments to Technology in schools were made in the Victorian State Budgets. These are summarised in Table 2.1, along with additional initiatives that were funded during this time.

Table 2.1
Specific Commitments to Technology in Schools in Victorian State Budgets and Initiatives (DEECD, 2007a, DEECD, 2007b, DET, 2002)

Year	Commitment	Dollars (millions)
2001	$23 million over three years for additional computers and networking	23
2002	$40 million to enhance eLearning in school environments by providing "computer pods" adjacent to classrooms in all secondary or P-12 (secondary component) colleges (initiative)	40
2003	$8 million over four years to give non-government schools continued access to the VicOne internet network	8
2004	$30.5 million boost for information and communication technology including	48
	$16 million over four years - provide faster access to the internet for hundreds of schools across Victoria	
	$1.5 million allocated to pilot and evaluate a new student management system	
2005	$89.3 million four-year initiative to provide a high-speed, fibre-optic broadband system to all Victorian government schools	102.3
	$7 million to expand the number of high-tech classrooms in schools across Victoria	
	$6 million to upgrade information and communication facilities in Victorian government schools allowing them to operate a wireless local network (initiative)	
2006	Normal budget with no new initiatives	0
2007	$68 million for Ultranet and computers in schools	68

One additional item not included in Table 2.1 is the 2001 annual commitment of seven million dollars per year by the state government to help sustain and refresh ICT in Victorian government schools. From these figures alone, we can see the enormity of the financial input. This of course excluded human resources such as ICT technicians and teacher professional development leaders, teacher time and individual school initiatives. Also excluded from this amount were other smaller projects such as the RePC Program (formerly Surplus Computers Program), which distributed "surplus to needs" computers and printers from Government Departments

and Industry to schools at no cost, and the Notebook computers to which teachers and principals in Victorian Government schools all have access (DET, 2005).

With a ratio of 3.54 students per curriculum computer and 40,163 teacher and principal notebooks in the Victorian Government Schools in 2007 (DEECD, 2007b) there was more than sufficient technology for schools to be using ICT in the classrooms every day. So, who was or was not using technology and why? According to the Department of Education and Training in 2002:

> One of the key barriers to broader use of Educational Technology in schools is the low technology skill level of teachers. Some respondents commented that this situation had improved with the introduction of the (Victorian Education Department) Teacher Laptop Program. However many teachers still have a fear of technology. (DET, 2002, p. 10)

Many teachers have attended a range of professional development with ICT but the amount of ICT being used in schools has not been commensurate (Hadfield, Maddux & Love, 1997; Jamieson-Proctor & Finger, 2006; Lam, 2000; Lloyd & Albion, 2005; Rovai & Childress, 2002; Zhao & Cziko, 2001). One reason cited frequently in the literature was that many teachers were not comfortable with technology (Oliver, 2005; Pina & Harris, 1993; Smith, 2000; Tenore, 2000). Teacher attitudes towards computers have been the subject of many papers. It was noted that these attitudes did not support teachers learning with computers or using them in classrooms (Cookson, 2004; Hardy, 1998; Hidalgo, Lu & Miller, 2000; Kluever, Lam, Hoffman, Green & Swearingen, 1994; Laffey & Musser, 1998; and Lam, 2000). This range of literature discussing teachers and their use, or lack thereof, of technology in teaching and learning supported Tenbusch (1998) who stated in his paper on technology staff development: "The biggest obstacle to the implementation of technology in education isn't the lack of hardware, but rather the fact that many teachers aren't ready to use computers in the classroom" (p. 1).

Research has been conducted into the attitudes to computers of in-service and pre-service teachers (Hardy, 1998; Hidalgo et al., 2000; Hunt & Bohlin, 1995; Jamieson-Proctor & Finger, 2006; Laffey & Musser, 1998; Milbrath & Kinzie, 2000; Teo, Lee, & Chai, 2008). This literature led to identifying the major factor inhibiting computer use in the classroom, namely computer anxiety among teachers (Bradley & Russell, 1997; Crouch & Montecino, 1997; George & Camarata, 1996; Hadfield, Maddux &

Love, 1997; Jamison-Proctor & Finger, 2006; Kluever et al., 1994; Phelps & Ellis, 2002; Pina & Harris, 1993; Rovai & Childress, 2002; Tenore, 2000). These authors agreed that there were still many teachers in our schools who experienced anxiety at the thought of teaching with computers. Hadfield et al. (1997) reviewed a range of earlier data and supported some findings with their own data. These data suggested that computer aversion was strongly tied to lack of computer experience. They found that "the level of computer experience accounted for more of the variance in computer aversion (43.6%) in the pre-service sample than any other individual or demographic variable" and that "although the vast majority of teachers have access to computer technology in their classrooms, less than one-half of them actually integrated computer use into the curriculum" (p. 23).

Teachers whose use of computers was inhibited by their anxieties towards the technology were the ones this research was intended to assist. Those teachers, who were anxious at the thought of computers, needed to be encouraged to use them in their classrooms. From my experience these teachers heard others talk about using technology in their classrooms and thought those other teachers were extraordinary because they could use computers. They did not realise that they too were also able to use technology in their classrooms. Was it all a matter of confidence?

How teachers learn to use ICT best is still debated but I believed at the commencement of this study that to use the ICT tools effectively in their classrooms, teachers needed confidence. A simple way to develop confidence, from my experience, was to build some basic skills with hardware, software and peripherals. I was not claiming that this acquisition of skills and knowledge would automatically lead to high quality teaching with ICT, but I did believe that it built the important factor of confidence, which the literature implied was a prerequisite for the successful use of technology in the classroom.

Once it was recognised that some teachers suffered from anxiety towards computers and their use in the classroom, it was possible to move forward and look at how to counteract that anxiety. Decisions could then be made about how teachers could be assisted best in gaining skills with the hardware, software and peripherals for use in their classrooms. What were the optimum conditions in which teachers learned? To know this, it was necessary to look more closely at how adults and specifically

teachers learned. The next section of the review will examine in detail the research on adult learning. This will be followed by a discussion of the literature on teacher professional development.

2.3 ADULT LEARNING

We all start our lives with a natural inclination to learn (Piaget, 1979; Vygotsky, 1978). This follows us through our early years as we learn to walk and talk, through our formal schooling and on through our working years, till the day we die. As teachers we focus on the learning styles of our students, the children. In this study the focus was different. It needed to be on the learning styles of the adults involved. So what exactly is adult learning? This section of the literature review will examine key research on adult learning, leading to an investigation of the literature on teacher professional development.

Defining *learning* was a challenge as many authors have different interpretations of the concept, but as Bower and Hilgard (1981) stated:

> While it is difficult to frame a definition of learning adequate to cover all diverse forms and exclude other causes of behavior change, the definition of learning itself is not a major source of difference between learning theories. Their differences are over issues of interpretation, not over definition. (p. 14)

Unlike education which "emphasizes the educator, the agent of change" the term learning "emphasizes the person in whom change occurs or is expected to occur" (Knowles, 2005, p. 10). The learning is not seen as one isolated moment in people's lives that can be pinpointed, but the process, or journey they take. As Zemke and Zemke (1984) stated, "learning is a means to an end, not an end in itself" (p.1).

Others take this definition further and explore the possibility that learning encompasses more than a process. Smith (1982) stated that the term learning "is used to describe a product, a process, or a function" (p. 34). Although Smith's individual components of product, process and function are supported by many theorists (Botkin, Elmandjra & Malitza, 1979; Gagne, 1965; Gardner, 2004; Knowles, 2005), his definition is broader than we require for this project.

Smith (1982) went further to state that "reflecting on the wide array of available learning theories and definitions of learning, one finds perhaps only one common feature: newness. Something that did not exist or was not grasped has been manifested or brought to light" (p. 35). Many other authors, when defining learning used different words to describe what is basically newness. The terms used include both "change" and "growth" (Bower & Hilgard, 1981; Bruner, 1971; Crow & Crow, 1963; Gagne, 1965; Skinner, 1968). The use of these three terms; newness, change and growth assist to define the process of learning in simple terms.

Other theorists saw the emphasis on growth, with its focus on cognitive development, as too narrow to explain what learning was about. They saw learning as a process that included a range of items including personal involvement (Rogers, 1983) and emotional and imaginal skills (Jones, 1968).

Gagne, Bloom and Gardner expanded the definition of the learning process further by creating domains, taxonomies and intelligences. Gagne identified five domains of the learning process: motor skills, verbal information, intellectual skills, cognitive strategies, and attitudes. Bloom (1956) in the development of his Taxonomy, identified three domains of educational objectives; cognitive, affective and psychomotor. The contributions of these theorists were all important in giving a more thorough explanation of what learning entailed and enabled more focused discussion and development of learning activities. Gardner (2004) developed eight intelligences (with a ninth "in a holding pattern") that he defined as "a biopsychological potential to process specific forms of information in certain ways" (p. 29). These intelligences have been and are still used as an umbrella for learning in many schools today.

Learning obviously, is not simple to define, but taking into consideration the broader aspects of learning described in the literature, this study focused on learning as a process, and specifically a *process of change and/or growth.* Therefore the study focused on following the learning journey of teachers, reporting on the change or growth process in relation to the teachers' knowledge, skills and confidence with ICT and the impact this change and/or growth had on their classroom practice.

Since this particular study dealt with adult learning, it was important not only to look at the term learning, but also to define *adult*, since adults were the major learners in

this project. So, what did we mean by adult? Knowles (1990) offered four definitions for the term adult:

> First, the *biological* definition: we become adult biologically when we reach the age at which we can reproduce … Second, the legal definition: we become adults legally when we reach the age the law says we can vote, get a driver's license, marry without consent, and the like. Third, the social definition: we become adult socially when we start performing adult roles… Finally the psychological definition: we become adult psychologically when we arrive at a self-concept of being responsible for our own lives, of being self-directing. From the viewpoint of learning it is the psychological definition that is most important. (p. 57)

Based on the range of theorists' definitions of learning and Knowles' (1990) view of adult learners, it was decided that the adult learner in this project, in the simplest terms, was a self-directing person who was responsible for her/his own life and who was undergoing a process of change and/or growth. Other relevant aspects included the conditions that best suited their learning and what assumptions they made about how they learned.

Change and growth facilitate a need for an adult to learn, but why are adults motivated to seek certain paths of learning? What motivates them? Intentional learning had a range of motivations but "more than half of the person's motivation was to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself (sic)" (Tough, 1979, p. 1). Though some learning did happen without specific thought from the learner, many motivations were initially hidden and arose during the learning process. Taylor, Marienau and Fiddler (2000) stated, specifically referring to adults:

> Most adults who initially seek out formal learning to help them deal with external change do not realize that it is also likely to engender internal change … If asked, most are likely to name reasons connected to job security or career advancement; a few come 'just because' learning something new appeals to them for its own sake or … to complete something left undone … Though adults' expressed purpose is usually to work towards pragmatic goals, thoughtful self-reflection often reveals more complex desires. (p. 9)

So it is for teachers, as they are confronted by the change that computers have brought to education. The influx of technology in schools has been a life changing

time for most teachers who have had to adapt to broad changes in their professional lives, with computers impacting on resources, planning, pedagogy, assessment and reporting. This changing use of technology was clearly a motivator for schools to encourage, and teachers to undertake "learning experiences in order to cope with specific life-changing events" (Zemke & Zemke, 1984, p. 1). Zemke and Zemke agreed that once teachers began the learning then "increasing or maintaining one's self-esteem and pleasure are strong secondary motivators for engaging in learning experiences" (p. 1). So, professional development must increase and maintain the teacher's self-esteem and pleasure in order to hold their interest.

There is considerable discussion in the literature about how adults, once motivated, actually do learn. As Malouf (2003) put it, "adult education is about learning, not teaching" (p. 165). He pointed to the fact that the learner is the most important person in the situation, they are the focus and they have the control. Knowles (1990) agreed when he stated:

> All of the great teachers of ancient times ... were all teachers of adults, not children. ...they came to have a very different concept of the learning/teaching process from the one that later came to dominate formal education. They perceived learning to be a process of active inquiry, not passive reception of transmitted content. (pp. 27-28)

The ancient Chinese and Hebrew teachers used what we would call the case method where a leader or one of the group described a situation, often as a parable, and the group explored jointly its characteristics and possible resolutions. The ancient Greeks used that Socratic dialogue where the leader or group member posed a question or dilemma and the group members would pool their thinking and experience in seeking an answer or solution. Finally, the ancient Romans had more confrontational challenges that forced group members to state positions and then defend them. These ancient methods of the learning/teaching process offer some basis for adult education today (Knowles, 1990).

Although these ancient teachers utilized unique characteristics of adults as learners, Knowles (1990) noted that only "in the last two decades have these notions [about the unique characteristics of adults as learners] evolved into a comprehensive theory of adult learning" (p. 28). Knowles went on to discuss the evolution of research on adults as learners, as he saw it. This evolution showed the range of attention that

adult learning received over the past 80 years. It also allowed the development from the original Lindeman (1926) Key Assumptions (see Table 2.2) about adult learners, through the attempts at adapting child learning theories to suit adults, the clarification and elaboration of the major factors in adult learning, to the discussions of adult learning styles and the physiology of adult learning, to be seen.

Table 2.2
Lindeman's Key Assumptions About Adult Learners

- Adults are motivated to learn as they experience needs and interests that learning will satisfy.
- Adults' orientation to learning is life-centered.
- Experience is the richest source for adults' learning
- Adults have a deep need to be self-directing.
- Individual differences among people increase with age.

Pedagogy is a term that has been used to describe children's learning. A term that has been used to describe adult's learning is Andragogy. This simply meant the art and science of helping adults learn (Knowles, 1990). In a formal sense, adult learning was around and considered long before formal child learning. There have been numerous debates over time about the relevance of the term Andragogy. Alexander Kapp, a German grammar school teacher, who used the word Andragogik to describe Plato, coined the term in 1833. The German philosopher Johan Friedrich Herbart strongly opposed the use of the term and the term consequently disappeared for nearly 100 years. In 1921, Eugen Rosenstock, a German social scientist, thought he invented the term Andragogy until he was told in 1962 of its earlier use.

The word Androgogy was first published in 1951 when Swiss Psychiatrist Heinrich Hanselmann published *Androgogy: Nature, Possibilities and Boundaries of Adult Education*. This was followed in 1957 when a German teacher published *Introduction to Andragogy: Basic Issues in Adult Education* (note the change in spelling). It was used more frequently then and first appeared in a dictionary (*Addenda of Webster's 3rd New International Dictionary (Unabridged)*) in 1981 (Knowles, 1990).

Originally Pedagogy and Andragogy were considered to be quite different, but as Burns noted in 2002, the two became more alike as time went on. The comparison between the two was not seen as important to this research, but what did have implications from the reading about adult learners for this study was the fact that

adult learners have different characteristics to child learners, and maximising the conditions under which they learn was the more important aspect.

2.3.1   Characteristics of adult learners and appropriate learning conditions

Lindeman (1926), whom many identify as the father of adult education stated that "in adult education the curriculum is built around the student's needs and interests" (p. 4). He then went on to say "the resource of highest value in adult education is the learner's experience" (p. 7). Both of these statements were supported in the adult education literature. Firstly adults expected their needs and interests to be the focus of any learning they did. Lives were busy and if there was no need or interest to learn something, most adults would rather use their time in other ventures. This was particularly true for teachers who had a constant stream of commitments and expectations on their time. Adults needed to know why they needed to learn something before undertaking it. Once they knew they needed it, they were ready and willing to learn (Burns, 2002; Knowles, 1990). This project will need to take into account the needs and interests of the teachers and reflect on what is happening in their classrooms. The computer software or peripherals chosen had to be selected in consultation with teachers to reflect these needs. The teachers' interests were then interwoven.

As noted by Lindeman, the value of the learner's experience could not be overstated. Whether past experiences had been positive or negative, they had an impact on the adult's ability to learn. It was recognised in the literature that adults had a large quantity of very valuable experience that must be the basis of their learning (Burns, 2002; Knowles, 1990). Knox (1987) agreed stating that "the most valuable information you can obtain in order to help people learn something is what they already know about the subject" (p. 38). Many teachers had limited experience with technology. The experience that teachers did have was in the area of learning and this gave them a strong basis for taking on new ideas.

The teachers' lack of experiences with ICT was something that informed the way the professional development was designed. In order to give the teachers the appropriate experiences so that they could build their learning, a sequence of experiences needed to be provided throughout the sessions. Mentors were also

encouraged to relate teachers' previous activities in the classroom to those the computer would enable them to do differently.

In the literature, adults were seen as active learners. They did not want to sit by and be taught passively. They were focused on being part of the learning process, both in the planning and presentation. They wanted to have control of their learning (Knowles, 1990). Carl Rogers (1969) summed this up well when he stated that "there is evidence from industry as well as from the field of education that such participative learning is far more effective than passive learning" (p. 162). Knox (1987) described active learning taking many forms in which "participants help clarify preferences, make choices, ask questions, seek answers, select activities, practice procedures, and give you feedback on their progress and satisfaction" (p. 35). These items were seen as essential in any adult learning situation. In this project the teachers needed to be active in the selection of software/peripherals and the choices they made as to the uses of each.

The approach or theory best suited to the particular learners will depend on the attributes those learners bring. Knowles (1990) made six assumptions about adult learners. These have been summarised in Table 2.3.

Table 2.3
Knowles' Assumptions About Adult Learners

[1]Need to know	Adults need to know why they need to learn something before undertaking to learn it.
Self concept of the learner	Adults have a self concept of being responsible for their own decisions, for their own lives.
[3]Experience of the learner	Adults have a great quantity and quality of experience.
Readiness to learn	Adults come ready to learn those things they need to know.
[2]Orientation to learning	In contrast to children and youths' subject-centred orientation to learning (at least at school) adults are life-centered (or task-centered or problem-centred) in their orientation to learning. This is critical!
[4]Motivation	Adults have some external pressures but the most potent motivators are internal pressures.

[1]Adults are motivated to learn as they experience needs and interests that learning will satisfy.
[2]Adults' orientation to learning is life-centred. [3]Experience is the richest source for adults' learning.
[4]Adults have a deep need to be self-directing.

Fogarty and Pete (2004) shed light on these early findings, including the work of Malouf (2003) and Scott (1985) when charting nine considerations for adult learners. The characteristics Fogarty, Pete, Malouf and Scott saw in adult learners have been combined and summarised in Table 2.4. This further enhanced the image of the adult learner. Interestingly Fogarty and Pete (2004) noted that these "findings have proven true over time and remain respected in the field as prominent issues and concerns of the adult learner" (p. 15).

Table 2.4
Attributes of Adult Learners as outlined by Fogarty, Malouf and Scott

Fogarty & Pete (2004, pp. 15-25)	Malouf (2003, pp.16-20).	Scott (1985, pp. 11-12)
[4]Control of their learning	[4]Strong feelings about the learning situation	[4]Are independent and responsible
[1]Immediate utility	[1]A specified purpose for their learning	[1]Usually want quick efficient payoffs for immediate application
[2]Focus on issues that concern them	[2]More strongly motivated by internal pressures than external rewards many preoccupations	[2]Often come from role as a worker, parent, spouse, or enthusiast or from personal crisis although specific reasons for attending will vary. Often have conflicting responsibilities and pressures outside the class
Test their learning as they go Expect performance improvement		Often have highly developed self esteem and can feel threatened about the possibility of looking a fool or being a failure
Anticipate how they will use their learning	Set habits and strongly established tastes, proud of their independence, selective filters and firmly established attitudes	Orientation to learning is often problem centred
Maximise available resources	[3]Have a lot of experience to draw on	[3]Have a wealth of experience which should be used in learning. Physical ability, dexterity and short-term memory can decrease with age but other mental capacities (for example reasoning) can increase as a result of experience
Require collaborative, respectful, mutual and informal climate		Can have different learning styles which may require conflicting teaching approaches
Rely on information that is appropriate and developmentally paced		Are likely to be more judgemental and frank if teaching is inappropriate

[1]Adults are motivated to learn as they experience needs and interests that learning will satisfy.
[2]Adults' orientation to learning is life-centred.
[3]Experience is the richest source for adults' learning.
[4]Adults have a deep need to be self-directing.

The five key authors that have been discussed here have their foundations in the key assumptions about adult learners first posited by Lindeman in 1926. Although they all differ in wording or inclination slightly, they all agree on four of Lindeman's five key assumptions, those being adult learners are motivated to learn as they experience needs and interests that learning will satisfy; adults' orientation to learning is life centred; experience is the richest source for adults learning; and adults have a deep need to be self-directing. These are indicated with footnotes in Tables 2.3 and 2.4.

Lindeman's fifth assumption that individual differences among people increase with age seems to have been discarded by others as they expanded assumptions to make them more specific to their needs and added assumptions or attributes of their own. Fogarty and Pete (2004) for example, described the need for immediate utility. This was an attribute that stood out for this project. Teachers needed to receive quick, efficient payoffs for their input and expected to immediately apply their learning. In this study, this was incorporated into each school's plan for their professional development, as will be outlined in Chapter 3.

Also noticeable in Table 2.4 is that the last three of Fogarty and Pete's attributes were focusing more on the climate of the adult learning situation. These were further developed by Fogarty & Pete (2004), Malouf (2003) and Scott (1985), when they considered the physical environment, the human and interpersonal environment and the organisational climate. It was important in this research to ensure the environment was suitable, particularly as the human and interpersonal environment was different to most learning environments in which the participants found themselves.

With these attributes and considerations in mind, a climate that was conducive to adult learning could begin to be imagined within the program described in this study. Each consideration needed to be taken into account when setting up the learning environment in each school. The particular attributes of adult learners listed in Table 2.4 were noted to ensure the researcher was aware of these during observations of the mentoring sessions. The teachers were also asked in their interviews for their responses to particular characteristics. It was interesting to see, in this different relationship of children mentoring teachers, which, if any, of these characteristics was prominent. This provided a focus for observational aspects of the study as these

attributes of the adult learner contributed to the framework to be used during data collection throughout observations.

The range of literature is very broad in the area of adult learning, but it was useful in defining the adult learner for this project as a self-directing person who was responsible for their own life and who was undergoing a process of change and/or growth. The literature also assisted in the clarification of the characteristics of adult learners and some of the environmental issues that confronted them.

However, since the students in the study were teachers, a question to be addressed was: What are the specific learning needs of teachers and how might these be addressed in professional development settings.

2.4   TEACHER PROFESSIONAL DEVELOPMENT

Teachers are involved in a wide range of professional development over their teaching careers. Teacher professional development has taken many forms in schools with some schools using one predominant model and others using a range of models. These models have included after-school or full-day sessions ranging from individual to group and whole school participation. Technology offers new options for professional development, with on-line and semi-on-line sessions. In my experience, of speaking to teachers following a broad variety of professional development sessions, many commented on both the value and the disappointments of these particular sessions. Teachers generally agreed that no model of professional development was ideal. The important issue was that, whichever model was chosen by schools, the optimum situation was to have a culture of ongoing professional development within the school.

One such model that was the basis for change in teacher professional development was the Apple Classrooms of Tomorrow (ACOT) model. ACOT, beginning in 1985, was developed as an alternative to traditional teacher professional development where teachers were removed from classroom practice and were not encouraged to construct their own learning. As this quote from the report on ACOT's two-year pilot project stated:

ACOT was a collaboration—initiated in 1985—among public schools, universities, research agencies, and Apple Computer, Inc. In ACOT classrooms, students and teachers had immediate access to a wide range of technologies … In addition, students can use an assortment of software programs and tools … In ACOT classrooms, technology is viewed as a tool for learning and a medium for thinking, collaborating, and communicating. (Yocam & Wilmore, 1994, preface)

This report described the evolution of a professional development project in which "teachers learnt not only about using technology in the classroom, but also about changing their instructional role" (Yocam & Wilmore, 1994, p. 1). As part of the ACOT mentoring model the teachers took on a new role, that of co-learner in the classroom. This assisted them to come to terms with the other new role expected in education - that of facilitator of the students' learning in a more student-centred classroom (Yocam & Wilmore, 1994).

The ACOT staff found that the teacher development approaches that had the most impact had the following features. They

- involved small-group collaborations;
- took place in working classrooms;
- built on teachers' existing knowledge;
- provided opportunities to experiment and reflect; and
- provided ongoing support (p. 3)

McKenzie (1991, 2001) wrote many articles regarding teachers as adult learners. His focus was on the classroom climate, the home of teachers. He saw teachers as "adult learners with individual learning style[s], different stages of development and quite divergent interest and needs" (p. 1). In a later article, he agreed with those already mentioned that "adult learning usually involves the learner in activities that match that person's interests, needs, style and developmental readiness" (McKenzie, 2001, p. 4). McKenzie believed that professional development should be experienced as "a personal journey of growth and discovery that engages the learner on a daily and perhaps hourly basis ... One learns by doing and exploring ... by trying, by failing, by changing and adapting strategies and by overcoming obstacles after many trials" (p. 4). He went on to state that we must create "the conditions, as well as the

inclination and the competencies to transfer new tools and skills into daily practice. ...Adult learning is all about melding practice with context" (p. 5).

In my experience, teachers have been encouraged to use computers, but have not always been supported in their learning of how to use computers to their full potential in their classrooms, to gain the best educational benefit for their students. Teachers commented that one of the largest issues was not being able to find professional development that they could fit into their time, budget and learning modes. Cookson (2004) elaborated on this difficulty:

> One of the key barriers to broader use of Educational Technology in schools is the low technology skill level of teachers. ... [the] situation had improved with the introduction of the [Victorian Department of Education and Training] Teacher Laptop Program. However many teachers still have a fear of technology, and although teachers are supposed to do 40 hours a year technology training, schools often don't have the courses available, or time release for them to achieve this level. (p. 10)

2.4.1 Principles of professional development

When thinking about professional development for teachers there were many key principles that needed consideration. In summarising the literature on effective professional development for teachers, Clarke (1994) developed ten key principles for effective learning. They were:

- *Address issues of concern and interest, largely (but not exclusively) identified by the teachers themselves, and involve a degree of choice for participants.
- Involve groups of teachers rather than individuals from a number of schools, and enlist the support of the school and district administration, students, parents and the broader school community.
- *Recognise and address the many impediments to teachers' growth at the individual, school and district level.
- Using teachers as participants in classroom activities or students in real situations, model desired classroom approaches during inservice sessions to project a clearer vision of the proposed changes.
- *Solicit teachers' conscious commitment to participate actively in the professional development sessions and to undertake required readings and classroom tasks, appropriately adapted for their own classroom.

- Recognise that changes in teachers' beliefs about teaching and learning are derived largely from classroom practice; as a result, such changes will follow the opportunity to validate, through observing positive student learning, information supplied by professional development programs.
- *Allow time and opportunities for planning, reflection, and feedback in order to report successes and failures to the group, to share "the wisdom of practice," and to discuss problems and solutions regarding individual students and new teaching approaches.
- *Enable participating teachers to gain a substantial degree of ownership by their involvement in decision making and by being regarded as true partners in the change process.
- *Recognise that change is a gradual, difficult and often painful process, and afford opportunities for ongoing support from peers and critical friends.
- *Encourage participants to set further goals for their professional growth.

Within this and the following lists of principles, an asterisk (*) has been used to mark those principles that are particularly relevant to this study. These selected principles focus on the practical nature of the learning to be explored. There is a focus on the needs of the particular teachers and schools under the umbrella of effective teaching and learning principles, as well as the practical issues such as timing and ongoing support. Those principles not selected were inappropriate to the child-to-adult mentoring situation, for example; *involving groups of teachers*, or *consciously provide links to other parts of the educational system*,

Although published in a book for teachers of mathematics, these principles were derived from studies of professional development in a wide variety of curriculum areas. When we look at Clarke's ten key principles for effective learning, some of them are quite clearly related to the previously discussed adult learning principles, however some of them focus on aspects that are specifically relevant to teachers.

If we then look at the principles of effective professional development established by Loucks-Horsley, Stiles and Hewson (1996) in the area of mathematics and science, the same relationship and new focus is obvious. Loucks-Horsley, Stiles and Hewson stated that effective professional development experiences:

- *are driven by a clear, well-defined image of effective classroom learning and teaching;
- *provide teachers with opportunities to develop knowledge and skills and broaden their teaching approaches, so they can create better learning opportunities for students;
- use instructional methods to promote learning for adults which mirror the methods to be used with students;
- build or strengthen the learning community of science and mathematics teachers;
- prepare and support teachers to serve in leadership roles if they are inclined to do so;
- consciously provide links to other parts of the educational system; and
- *include continuous assessment.

Clarke and Loucks-Horsley et al. have some principles in common. For example, both emphasised the importance of modelling desired classroom approaches/teaching strategies. However, it is interesting that there is less in common than might have been expected. The key focus of Clarke's ten principles was the teacher, whereas Loucks Horsley et al. focused more from a system perspective. Relevant principles would inform the development of a list of assumptions to underpin any model for child-to-adult mentoring professional development, focused on the use of ICT. This process is described in Chapter 6.

It was interesting also to note that less than half of the principles for effective professional development related to the attributes discussed in adult learning. Although a classroom influence was anticipated, this study did not intend to directly influence the teachers' classroom practice. The mentors were to guide the teachers in developing skills with the computer peripherals and software. In this project, the focus was more on including the principles that enabled teachers to grasp the skills they needed to build their confidence. This would in turn encourage them to further their professional learning in the pedagogy and use of technology in their classrooms.

In the Victorian context, the Department of Education and Training (DET) developed seven principles of highly effective professional learning. They state that Professional Learning is:

- focused on student outcomes (not just individual teacher needs);
- focused on and embedded in teacher practice;
- informed by the best available research on effective learning and teaching;
- collaborative, involving reflection and feedback;
- evidence based and data driven;
- ongoing, supported and fully integrated into the culture and operations of the system;
- an individual and collective responsibility at all levels of the system; and
- not optional. (DET, 2005)

These DET-developed principles had a very strong focus on the planning of professional development and the laying down of foundations for a professional learning culture within schools, as this quote from DET describes:

> Professional learning that is consistent with the Principles is ongoing, school based and directly relevant to the daily work of teachers…. At a broader and more ambitious level, the Principles will lay the foundations for the development of a culture where schools are routinely and typically seen as places where both teachers and students learn, where professional learning is a normal part of every teacher's daily routine. (2005, p.4)

This was in agreement with the desired outcome of the mentoring process that is the basis of this study. It endeavoured to change the culture of the classrooms in the project in such a way that they became places for learning of both the students and the teachers.

All of these principles were useful, but they were only a part of the effective professional learning picture. This DET model for Effective Professional Learning has Teacher Knowledge and Skills as the next level. This is expanded to Pedagogical, Discipline, and Pedagogical Content Knowledge to more specifically define the learning. Finally DET listed the Effective Learning Models of which leaders needed to be aware in order to assist school staff in the most appropriate way on their professional learning journey.

Interestingly, of the four studies listing principles of effective teacher professional development, only the ACOT study listed building on teachers' existing knowledge. The fact that experience is the richest source for adults' learning was fundamental to

the literature on adult learning, yet only one study listed it as a feature of teacher professional development. The key features that were common amongst the literature discussed here were that teacher professional development should: involve collaborative groups; take place in realistic situations; provide opportunities to experiment and reflect; and provide ongoing support.

In the light of these principles, useful strategies for professional development are explored in the following section.

2.4.2   Strategies for professional development

In their book entitled *Designing Professional Development for Teachers of Science and Mathematics*, Loucks-Horsley, Hewson, Love and Stiles (1998) discussed a range of strategies for professional learning. Of the 15 strategies discussed, one with particular relevance for the focus of this research is *Coaching and Mentoring*. They believe that Coaching and Mentoring should:

1.   usually occur both in and out of class;
2.   offer formal and structured opportunities;
3.   have facilitators or leaders with knowledge and skills of a more experienced adult in a one-on-one relationship;
4.   offer varying but ongoing time periods;
5.   provide the confidence and ability to improve practice as learning goals are addressed;
6.   contain key elements that focus on learning or improvement mechanisms for sharing and feedback and opportunities for interaction;
7.   be implemented in a climate of trust, collegiality, continuous growth, allowing long term commitment to interaction;
8.   include skill building in coaching and mentoring and administrative support;
9.   contain trust and sharing relationships to overcome norms of isolation and privacy including time to meet; and
10. use approaches that vary so participants can choose one that suits them.

For this study, these characteristics of Coaching and Mentoring were particularly useful. They outlined the major practical issues that needed to be taken into consideration when planning the program. The only major difference was that the

facilitator or leader, the mentor, was not a more experienced adult but a child who had more relevant experience and confidence with ICT than the adult mentee.

Also taken from the Loucks-Horsley et al. (1998) model of Workshops, Institutes, Courses and Seminars was the fact that there must be opportunity for the learners to shape the sessions, time for reflection, prediction and exploration, and a safe environment for experimentation. Teachers needed to know that the professional learning in which they were participating was valuable to their classrooms. Just as children do, teachers needed to explore and experiment.

Previously noted principles provided general direction for the development of this professional development model, but as this study was specifically focused on technology it was necessary to find models with a technology focus. With this in mind, the *Components of Effective Professional Development for Technology Use,* elaborated by Rodriguez and Knuth (2000) were explored. The components they saw as essential to effective professional development for technology in schools are listed in Figure 2.1.

• Connection to student learning	• Ongoing process
• Hands-on technology use	• Sufficient time
• Variety of learning experiences	• Technical assistance and support
• Curriculum-specific applications	• Administrative support
• New roles for teachers	• Adequate resources
• Collegial learning	• Continuous funding
• Active participation of teachers	• Built-in evaluation

Figure 2.1. Components of effective professional development for technology use*.*

Six of the 14 components (*new roles for teachers, sufficient time, technical assistance and support, administrative support, adequate resources and continuous funding*) were primarily seen as the domain of the schools and in committing to the research the school principals would need to provide these items when necessary. Having said that, the proposed model required less administrative support and funding than most other forms of professional development used in schools as the model utilised the students within the schools and therefore did not rely on staff or outsiders who would need time allowances funding.

The other items in Rodriguez and Knuth's (2000) list of components were practical issues that applied directly to this research. These were: *connection to student learning, hands-on technology use, variety of learning experiences, curriculum-specific applications, collegial learning, active participation of teachers, ongoing process* and *built-in evaluation.* The connection of these to the project is discussed now.

1. Connection to student learning. The aim of all teachers was to improve student learning. Although teachers attended professional development to learn or improve something for themselves, their ultimate aim was that this would flow on to improvement in their students' learning. In this project the teachers all learned the use of a computer peripheral (digital camera) and related programs that were directly connected to something they would do with the students in their class.

2. Hands-on technology use. There was no value in only talking to teachers about technology. They needed to use it. The aim of this project was to get teachers sitting at a computer or holding a digital camera, with a child taking them through the processes and assisting them to master the software or peripheral. Teachers needed to have contact with the tools to learn how to use them.

3. Variety of learning experiences. No one model for professional learning would be perfect for every person in every situation and a range of models needed to be developed for a rounded professional learning experience. The model that was the focus of this research was intended to be used in the development of skills and knowledge in teachers, but most of all to increase their confidence so that they felt able to integrate technology into their classroom practice.

4. Curriculum-specific applications. This was vital to this program. To successfully integrate technology into the curriculum, teachers needed to have some understanding of the technology, so that through the use of technology with the mentors, they could discuss their functions and consequently their uses in the curriculum.

5. Collegial learning. Although the focus in this project was on the students as mentors, if we look at student mentors and teachers as colleagues, then collegial learning was actually a large component of the project. This could of course also flow from teacher to teacher as they discussed and shared what they learned in the mentoring sessions although this was not a timetabled component of the project.

6. Active participation of teachers. Rodriguez and Knuth recommended two strategies to encourage teachers to participate in professional learning with technology. They suggested mandating participation and/or systems of incentives. Within this project, some staff required both components, but for most, the incentive of becoming more confident with technology and seeing other staff grow in their confidence was incentive enough. Once reluctant teachers saw the positive impact of the student-mentoring model on the other staff and their classroom practice, they too were keen to be involved.

7. Ongoing process. Any professional development program should be an ongoing process to produce the best results. This mentoring model is considered viable in the long term as a process developed in the school and passed on from grade to grade. In this way, each student in the school will eventually learn the mentoring process and work with teachers as required. Teachers were also encouraged to utilise their mentors as support after the project was completed.

8. Built-in evaluation. This was also seen as useful to the project and through discussion, both individually and as a class, it was clear that the children were aware of the teachers' learning. Some children even tested teachers along the way by asking them to repeat something they had been shown.

Whilst all of these characteristics of professional development informed this study, no one list applied completely to this particular situation, so a new list to underpin the creation of the child-to-adult mentoring model was created. This list of assumptions was based on components of the Rodriguez and Knuth (2002) *Model of effective professional development for technology*, and included other items deemed appropriate from other literature discussed. One item that was not included in any

previous models was the relationship between the teacher and child. As this project is focused on using a child-to-adult mentoring model, a concept in professional development that has not been fully explored, the relationship between the child and adult is a component of the situation that may have an impact on the outcomes. As such it is important to include this relationship and to make it a focus of the research. The new set of assumptions that underpin the child-to-adult mentoring model proposed here is outlined diagrammatically in Figure 2.2 and elaborated further in Chapter 6.
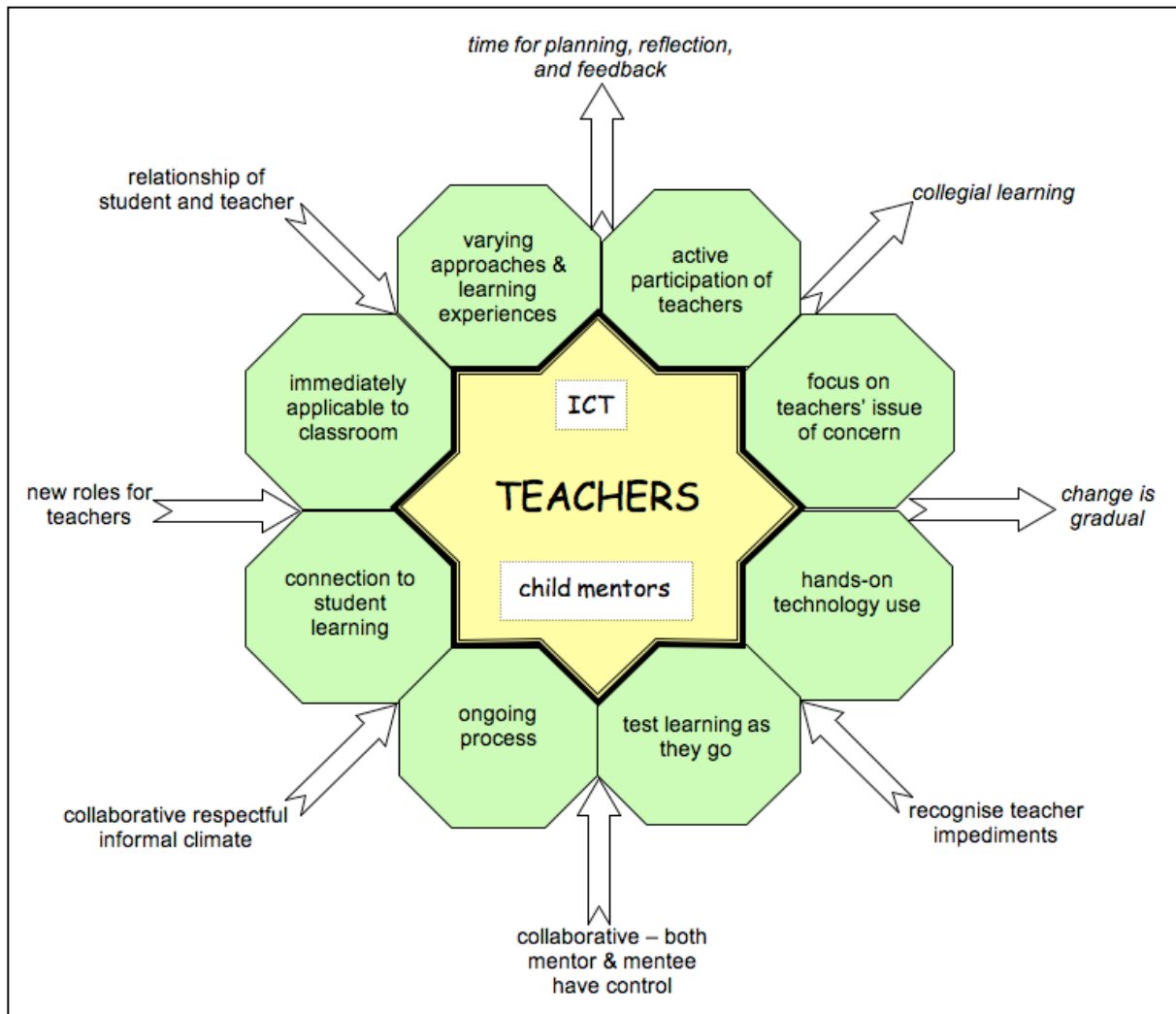
Figure 2.2. Diagrammatic representation of the assumptions that underpin the child-to-adult mentoring model.

These assumptions structured the form of the program in the schools. They comprised the practical issues that needed to be taken into consideration as the program was being established in each school. As the theoretical framework upon which the research was based, it was also used to assist and direct the data collection and analysis.

A key question underpinning this study was how an in-school mentoring program using students to assist in the area of teacher ICT professional development could be beneficial. It was therefore necessary to look at how mentors have previously been used in society and specifically in schools and if these options could inform this research. A discussion of this follows in the next section.

2.5   MENTORS

The adult learners in this project faced a different form of learning to those with which they were familiar. The adult learners had a mentor, but that mentor was a child. The literature describes a range of information on mentoring relationships starting with the story of how the name Mentor came about from Greek Mythology. It appeared in Homer's Odyssey circa 800BC where Odysseus, King of Ithaca entrusted care of his household and teaching of his son to Mentor, a trusted friend. The name mentor then became synonymous with trusted advisor, friend, teacher, and wise person (Carruthers, 1993).

Shea (1992) agreed when he stated that mentors were those "special people in our lives who, through their deeds and work help us to move towards fulfilling potential" (p. 3). He also defined mentoring more as a process whereby "mentor and mentee work together to discover the mentee's latent abilities" (Shea, 1992, p. v).

Focusing more in the education sector, O'Mahony and Matthews (2005) discussed building teams for school improvement, and examined the use of mentoring to improve teaching and learning practices. They stated "the decision to use mentoring to improve teaching and learning in classrooms is fundamental to school staff improvement and school change. Educational researchers are beginning to link directly quality mentoring, quality professional development and school improvement" (O'Mahony & Matthews, p. 13). They saw the goal as "not to create high quality mentoring programs as ends in themselves, but rather to incorporate mentoring as part and parcel of transforming teaching into a true learning profession" (p. 14).

O'Mahony and Matthews went on to discuss the use of mentoring for teacher renewal; including "on-the-job mentoring," mentoring for "increasing teacher knowledge," "changing classroom practice," "increasing student interest and

achievement," and "ongoing staff development" (pp. 15-16), all of which were relevant to this research. They suggested three things that should be kept in mind when thinking about mentoring: "Mentoring is a relationship, mentoring involves sharing and mentoring involves the development of yourself as well as others" (p. 22). Each of these three items had direct relevance to this research, so were kept in clear focus when designing the child mentor preparation sessions.

Definitions of mentors varied slightly but all described a person working with another to assist in their growth. However, all literature explored to this stage described an adult mentor and a younger mentee who may be a child or an adult but more usually was a colleague.

2.5.1 Children as mentees

The use of mentors in education is widespread in the literature. Mentoring occurred for and between both teachers and students. It was common to read about older students mentoring younger or less experienced students in school classrooms (Burgstahler & Cronheim, 2001; Roper-Davis, 1999; Smith, 2006). It was also common to read about students being mentored by a variety of teachers and/or parents in their school (Delgado-Gaitan & Ruiz, 1992; Gray & Albrecht, 1999). All of these mentoring situations had one thing in common; they all included an older and more experienced mentor and a younger, less experienced mentee, even when a child was the mentor.

2.5.2 Teachers as mentees

Many mentoring programs discussed in the literature involved a teacher being mentored. Mentoring has been utilised for pre-service teachers (Cuckle & Clarke, 2002; Hudson, 2003; Le Cornu, 2005), by pre-service teachers with a great deal of ICT experience to classroom experienced teachers with less ICT experience (Franklin, Turner, Kariuki & Duran, 2001; Lokey-Vega & Brantley-Dias, 2006), between teachers (Coupal, 2004, Gora, Hinson & Hall, 2003; Jamissen & Phelps, 2006) and by retirees to teachers (Walsh, 1989). Once again all of these mentoring situations had one thing in common; the more experienced assisting the less experienced. Please note that the use of the words "older" and "younger" has been

avoided here. Some pre-service teachers being mature-aged means the mentor may actually have been younger, but they were both adults in that situation.

Included in more technology-specific mentoring models used in schools were those in which the staff member with the technology knowledge and skills gave up their free time to help others (Tenbusch, 1998). Tenbusch encouraged schools to "consider enlisting the help of computer-literate teachers to provide help, support and guidance to their inexperienced or technophobic colleagues" (p. 6). He believed that individual tutoring was "crucial for getting past reluctance or fear" (p. 6). The idea of teachers supporting each other was also noted by Jamie McKenzie when he stated: "Some districts assign effective classroom teachers to this mentor and coaching role full-time for a year or more so that classroom teachers have a built in support system to take them through the most difficult early stages" (McKenzie, 2001, para. 29).

Also rating mentors for teachers highly in the professional development of teachers in ICT was a report on the evaluation of new initiatives announced in 1998 by the Ministry of Education in New Zealand (Ham, Gilmore, Kachelhoffer, Morrow, Moeau, & Wenmoth, 2002). In the ICT professional development model there, each school used in-school mentors or Lead ICT Teachers, with some providing a predetermined program of professional development to staff and others a program based on "identified needs working with the mentor teachers in their own schools" (p. 45). Both teachers and principals rated Technology Mentors highly in the end of project surveys, with 75% of teachers and 70% of principals rating them as "largely effective" or "very effective" (p.69).

2.5.3   Who then were the mentors?

All of the mentoring relationships discussed so far involved adults or a significantly older person as the mentor. There were very few reported models of children mentoring their teachers. Only three projects were found in the literature that covered this type of mentoring in schools. One such program that has been referred to as a mentoring model that was working in schools was the *GenYES*[1] program. "What makes *Generation www.Y* different from other strategies that have the same goal is

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[1] The name of GenYES has changed over time. Generation www.Y is the same program.

its use of students as assistants and supporters of teachers as they learn to use technology in the classroom" (Harper, Martinez, Hardy & Conor, 2005, pp. 24-25).

GenYES started as a grant-funded project in the Olympia School District in the State of Washington in 1996 and continued as a private organization as is described by Harper et al. (2005) in the GenYES program and curriculum guide:

> The purpose of the GenYES program is to assist with the effective integration of technology in teaching and learning, while engaging students in constructive, meaningful activities that support teachers and other members of the school community… The core of GenYES is the establishment of collaborative partnerships between students and teachers, with the express purpose of facilitating the integration of modern digital technologies in the practice on teaching…by blurring the distinctions between teachers and learners. (p. 2)

Since its implementation in 1996, the program has been put into operation in Grades 1 to 12, with the majority of participating students in Grades 5 to 8. The course was taught by a coordinating teacher and offered as a 30-week class in schools. Each GenYES student in these classes formed a partnership with a teacher. The partner-teacher chose a lesson plan or curriculum unit to upgrade or build from scratch. The student focused on the technical aspects of the project, meeting regularly with the partner-teacher to ensure that the project fitted with the teacher's curriculum plan and classroom needs.

The students provided Internet expertise (e.g., search out Web sites for information and help with electronic presentation of materials), while the teachers modeled skills such as communicating effectively, mentoring, solving problems, and project management (Generation YES Inc, 2002-2004). There was a range of information on this program on the Internet but it was difficult to see the full extent of the program without buying it. The 2005 GenYES Research Report was the only research-based document available at the time of writing (Harper et al., 2005).

The focus of the GenYES program was the development of collaborative projects created between the student and the partner-teacher. The teachers designed these projects with input from the students, but the students' main task was to supply the technological component (Harper et al., 2005). This was more of a collaborative

situation in preparing projects for the schools, and working collaboratively was mentioned far more in the documents than mentoring. One of the premises of the Gen Y model is that it is not necessary to train teachers to be proficient with technology (Harper, Conor, & Course, 1999).

This was not seen as what was needed in the primary setting in Australia at the time and therefore the focus was on student mentoring of teachers in the use of software and peripherals to develop confidence and skills with these items. It would be possible in the future that this could lead to further involvement in project development, but it was preferred to leave the pedagogical content to the teachers and ICT coordinators as that is where their expertise lies.

Another program was the Student Technology Leadership Program (STLP) in the state of Kentucky, USA. This program empowered students to "help with hardware and network maintenance, electronic lesson design, and technology instruction, as well as conduct community-based activities. The mission of the STLP is to advance individual capabilities, to motivate *all* students, and to create leadership opportunities through the use of technology. The goals of the STLP are:

1. to develop activities that enhance the academic, social, and emotional growth of participating students;
2. to provide leadership opportunities to students;
3. to foster multi-age collaboration by forming innovative learning partnerships;
4. to form learning partnerships between students with different technology skills;
5. to develop activities that benefit communities; and
6. to develop instructional activities that integrate technology, benefit the school, and support the Kentucky Education Technology System (KETS). (Harrison, 1999, p.11)

It should be noted that these goals focus on the students rather than the professional learning of the teachers.

Reports were also cited from one study that took place in Wellington College in Auckland, New Zealand. The school was a girls secondary school where the students were offered the role of "Tech Angels" from a range of leadership roles within the school. The school was well resourced in technology including an ICT professional development room. Teachers or students used this room during the day,

with the comfort of knowing that ICT support was always close at hand. The "tech angels" met and talked as a group once a week to chart needs and direction. They also received up to two hours training a week, delivered at least one thirty-minute lesson and provided support to two staff members individually. The school embarked on this project to enable young women to develop their leadership potential and to help staff to learn ICT skills. The feedback from staff was very positive with most surprised at how much they preferred the Tech Angels' support to any they had received in the past. For the staff involved, the outcome had been transformative. Teachers commented frequently on how their confidence and enthusiasm had altered since becoming a part of the Tech Angels' supported group (Feltham, 2004; McLeod & Baldwin, 2003).

Tech Angels expanded their original focus of staff mentoring to also include student mentoring, but staff mentoring continued, as the statement from their website shows:

> When the Tech Angel programme began, one of its main focuses was Staff Mentoring. This has continued through to the present day with Year 13 students being assigned a teacher who they mentor throughout the course of a year. This could take place during their free periods, lunchtimes or after school as often as necessary to reach the goals they have set at the beginning of their relationship. (Tech Angels, 2007)

The Tech Angels project had been described in two articles by staff at the school, and in 2005 research was undertaken, under the umbrella of the New Zealand Council for Educational Research (NZCER), focusing on how the Tech Angels project has impacted on learning at Wellington Girls' College, and how (if at all) the features and principles that support learning in this project can be applied in other school contexts (Bolstad, Gilbert & Hipkins, 2006). This NZCER research interpreted the Tech Angels in two ways. Firstly as an ICT initiative and secondly as an evolving and almost "experimental" initiative, the ultimate aim of which was to introduce new ideas about teaching and learning with ICT into the secondary school environment" (Bolstad, Gilbert & Hipkins, 2006, p. 24).

These Tech Angels were truer to the mentoring models that have been discussed previously. They were partnered with one or two teachers but their sessions were one-to-one, with the Tech Angels having the technology expertise in the relationship. The scale of the program at the school was again much larger than we were planning

here and was with much older children. While the Tech Angels project was based in a secondary school, the present research was based in a primary school where the aim was to assist the student mentors to consolidate their knowledge and skills with a digital camera and related software, so that they could then assist their mentee to gain confidence in their own skills, and therefore integrate the digital cameras and related software for the benefit of the whole class.

Although these child-to-adult mentoring programs were similar to what was proposed for this study, the Tech Angels' study focused on students in a secondary school, the GenY program focused on project development, and STLP focussed on the avenue provided to the students. None of these was the focus for this study. They were though all successful examples of students mentoring teachers that gave encouragement to the idea of a model for the primary school setting.

Personal communications with various teachers who have used forms of mentoring between students and staff in the primary setting have assisted in informing this program. Unfortunately although these mentoring programs have been successful in their schools, none of them have been research-based, and only one, to my knowledge was reported in the literature. This program was shared in a presentation and paper (Pazzi & Johnson, 2000). It described a mentoring program that was running in a Melbourne school. In this school-based teacher professional development program the Mentors in Computer Education (MICE) were a group of students selected from across the grade levels. The ICT coordinator mentored these representatives from each grade. They in turn assisted their classroom teachers and peers to develop their skills in ICT. Personal communications with Georgina Pazzi have assisted in informing this project, but as the MICE program focus was on training two students from each class whereas this project is focused on using a whole class of students as mentors, it was not a major influence.

2.5.4 Features of mentors, mentees and their relationship

Throughout the literature, various lists appeared regularly as characteristics, traits and qualities of mentors, mentees and the mentoring relationship. These varied from author to author. A list of indicators that were present generally in a quality mentoring relationship was identified in and refined from the research (Carruthers, 1993; Johnson & Ridley, 2004; Layton, 2002; McKenzie, 2001; Nigro, 1993; O'Mahony &

Matthews, 2005). These descriptors were sorted into like groups and used to inform the observations as discussed in Section 3.5.

2.6   SUMMARY

Developments in technology are moving at a faster rate each year, but the fundamental ideas of technology use in the classroom are reasonably stable. If we could build a student-teacher relationship that utilises the technology and develops confidence in its use, it would be easier for both teacher and students, as a team, to approach the technological advances as they emerged.

With the continuing expectation of integration of ICT in education, it was important to focus on utilising the facilities the system had provided to our best ability. Knowing the commonalities in adult learning and particularly teacher professional learning and knowing the important principles that needed to be considered if the professional learning of teachers was to be optimised, assisted in developing a model for teacher professional development in ICT utilising the children in their school. Knowing that there were still teachers for whom technology created anxiety was further incentive to develop this child-to-teacher mentor model in primary schools.

Mentoring has been shown to be a powerful strategy within a range of situations. It has also been shown to be successful for both teachers and children in a variety of situations. Although the majority of mentoring situations had the younger person mentored by the older, wiser person, there were two studies and one classroom based program cited where the students mentored their teachers. Although these were primarily with students in secondary schools, one study had worked successfully with younger children.

The literature explored throughout this chapter provided support for the chosen approach to be undertaken. It allowed the further exploration of a mentoring model that could offer teachers and students the chance to work together as a body of learners, and to share their combined knowledge for positive learning outcomes. The next chapter outlines the way in which the study was conducted, the data collected and the method of analysis.

CHAPTER 3

METHODOLOGY AND METHODS

"Computers serve best when they allow everything to change"

(Papert, 1993, p. 149).

The above quote, from the father of educational computing Seymour Papert, is at the heart of what this project was about. The focus of the student mentor professional development model to be studied was based on a change in relationship between teachers and students. This change is fundamental to expanding the effective use of technology in schools today. This study looked at the change in the relationship of teacher to student in an information technology professional development model and how the model, which acknowledges students' acceptance and utilisation of technology in their world and uses them as an integral part of the professional development, affected the teachers involved.

3.1 THE RESEARCH QUESTION

This research was concerned with the question:

What benefits of student mentors in ICT do teachers report? In particular what is the perceived effect of this approach on the teachers' skills, confidence and classroom practice with ICT?

This question had two main aspects. The first looked at the teachers and their perspective on the knowledge, skills and confidence gained from the project. The second was pedagogical and focused on how the changes to their knowledge, skills and confidence affected their classroom practice with ICT.

The research was situated within the interpretative paradigm, the central endeavour of which is "to understand the subjective world of human experience" (Cohen, Manion & Morrison, 2000, p. 22). Within the interpretative paradigm, the ontology is subjective and looks at the experience of the participant rather than the gathering of 'facts'. The interpretative epistemology is empathetic and looks at intersubjectivity, therefore encouraging a focus on the relationships that the participants have with others and their world. It is "characterised by a concern for the individual" (Cohen,

Manion & Morrison, 2000, p. 22). The interpretative methodology focuses on qualitative and interpretative data. In this project, this methodology was used more to understand the phenomenon than to emancipate it, as would be the case with critical research. Within the interpretative methodology the generic qualitative method and the case study method were used (Merriam, 2001).

My experience and impressions of education have been constructed through my interaction with other participants in my story, as well as through my personal interaction with them and their stories. For me, reality is seen in the way we interact with others and our universe. I have a strong foundation in the constructivist epistemology in which knowledge is something we construct through our interactions with our world and with the people who are a part of it. With this in mind the professional development program used in this research was situated in a social constructivist paradigm of learning (Ernest, 1999; Vygotsky, 1978).

The participants in the project had the greatest insight into their experiences and were the focus of the study. Case study methods were therefore used to explore the case of the mentoring program through the eyes of the participants and assist to clarify the readers' understanding of the professional development model. Case study methods allow us to "get as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors (thoughts, feelings, and desires)" (Bromley, 1986, p. 23).

This research began with a particular interest in the interactions between teachers and students and how students were being used to assist teachers in the integration of technology into their everyday classrooms. This research became a study of a professional development context where teachers were mentored in the use of technology by their students. This reality is not commonly seen in schools today and there has been very little research, particularly in primary schools, in this area.

Initially the research evaluated the impact of the whole program on teachers, students and the school as a whole. In essence, it focused on the big picture effect. This entailed using a survey method to ascertain how the professional development model operated and the value of such a program generally. This assisted in decision making regarding selection of specific case studies and also generated information

about changes in teachers and students during the program. The overall case researched was the phenomenon of the student mentor professional development model.

The research specifically looked more intensely at teachers' perceptions of what happened in this professional development model. A critical aspect of the research was the connection between the teachers' perceptions of what they experienced and what the researcher observed. The final cases researched will be the cases of individual teachers, as shown in Figure 3.1.
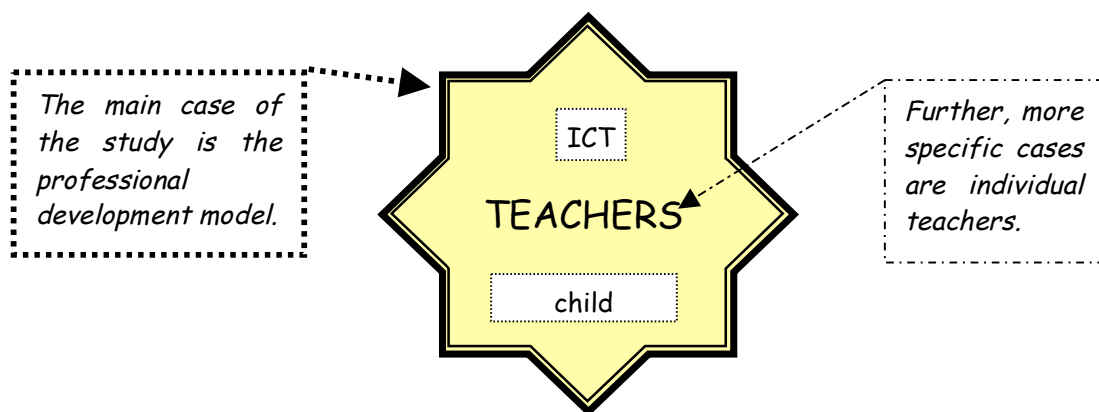
Figure 3.1. The case studies involved.

With the research question and cases defined, the next step was to identify the methods to be used for the project. The project was focused initially on the phenomenon of the professional development model where students were mentors, and the impact of that model across a diverse group of teachers. This lent itself to survey methods to enable a range of information, including attitudinal data, to be collected for a wide group of people. The collection of these data before and after allowed the study of change and established the impact of the program on the teachers involved.

As the research question was concerned with specifically investigating teacher perceptions, their interactions with the student mentors and how they saw this affecting their practice, a more in depth picture of individual participating teachers was needed. Data on the participants' attitudes, knowledge, skills and classroom practice were collected using a survey method. Further data to inform the question of teacher perceptions were collected using case study methods.

3.2 METHODS

Data collection in the form of surveys, observations, interviews and journals will be discussed in this section. The relationship to the research question of the various data is outlined in Figure 3.2. Individual items and further connections will be discussed throughout this chapter.

Research Question	Survey (pre and post)	Observation	Interviews	Journals	Survey (1 year later)
Teachers' confidence and skills	✓	✓	✓	✓	✓
Transference to classroom practice	✓		✓	✓	✓

Figure 3.2. Relationship of data collected to research question.

3.2.1 Case studies

Case study methods are highly appropriate for educational settings as they encourage the researcher to "concentrate on a specific instance or situation and to identify, or attempt to identify, the various interactive processes at work" (Bell, 2001, pp. 10-11). They also allow the opportunity for multiple data collection and analytic procedures that provide researchers with the opportunity to "compare and contrast interpretations, expand on the relevance of the project by developing unforseen findings and interpretations, and explore findings that are anomalous to or disconfirming of original hypotheses and impressions" (Freebody, 2003, p. 83). As Figure 3.1 shows, there were two specific levels explored in this project: firstly the overall case of the professional development program; and secondly, to give further insight into the program, the individual specific teacher case studies.

3.2.1.1 Survey method

To explore the impact of the professional development model, and its effect on the teachers, the children and others, enabling an image of how effective such a model could be at bringing about teacher change generally, different teachers in different school settings needed to be investigated. Thus the decision was made to gather data from two schools.

Because the research question focused on the effect of the approach, background and attitudinal data on all participating teachers were required. Thus, a survey method was chosen as the most efficient way to access data required to demonstrate the impact on teachers and the flow-on effect to their classrooms. The survey method allowed data to be collected from a wide range of people on more than one occasion. It allowed the collection of census type data that gave background details and attitudinal data encompassing teacher and student perception of attitudes, knowledge and skills. These data were all collected in response to a written questionnaire and recorded as quantitative data.

Wiersma and Jurs (2005) described two types of survey designs, longitudinal and cross-sectional. The research question was focused on the perceived effect of the student-mentoring program. As change was being investigated, a longitudinal survey design was most appropriate because it would allow the comparison of data from before the project through to the end of the project. The specific approach used was a panel study, which was described by Wiersma and Jurs (2005) as a "longitudinal study in which the same sample is measured two or more times" (p. 161). This allowed a comparison of data from the second questionnaire to the first, and extraction of the relationships and effects, thus providing information about change and the impact of the program. The cross-sectional survey was not suitable for this research since it is only administered once and "cannot be used for measuring change in an individual" (p. 162).

- Questionnaire

A questionnaire is useful in gathering both quantitative and qualitative data, while also allowing for open responses. The questionnaires in this research provided basic information on participants and also comments and thoughts from them that were further expanded during interviews. As participants completed both pre- and post-questionnaires comparative data were also gained on each individual's knowledge, confidence, skills and classroom practice using a zero to ten rating scale. These comparative data were used to determine participant responses to the various features of the program and how they affected participants.

Questionnaires were used for collection of data from both students and teachers. A survey for secondary mathematics teachers (Forgasz, 2003) provided the basis for the general and attitudinal questionnaire for this study. This survey was adapted, using questions from the pilot study questionnaires, for the teacher questionnaire (Appendix 1), and further adapted to a student questionnaire (Appendix 2). As well as collecting basic information, both personal and about the computer facilities available and/or used by participants, the questionnaires addressed the issues of students' and teachers' perceptions of their attitudes, confidence and skills with ICT. The teacher questionnaire generated data on the teachers' backgrounds in both teaching and use of ICT.

A further questionnaire was administered to available teachers one year after the completion of the project to provide data on teachers' skills, confidence and classroom practice in relation to ICT, and also on the frequency of and reasons for further contact with their mentors.

3.2.1.2 Case study method

The survey method was effective for collection of data on the professional development model used in this study. It generated data on aspects of each teacher's perceptions, although data at a more in-depth level were required for case studies of the individual teachers. A survey alone could not show all of the interactions that led to the changes taking place. To really look at the impact of the program, other components of the program, including how the teacher and student interactions developed, needed to be explored. The characteristics of the teacher and student interactions that supported any change needed investigation. To do this, a case study method was most appropriate as it allowed observation and insights into each case through the actions, insights and feelings of the participants. As described earlier, the question this research sought to explore had two main parts. Although each part of the question was explored using a case study method, to avoid confusion, I will refer to the student mentor professional development model as the overall case and the teachers within as further in-depth studies.

Stake (1995) defined a case as "a specific, a complex, functioning thing" (p. 2) and stated that:

> For the most part, the cases of interest in education and social service are people and programs. Each one is similar to other persons and programs in many ways and unique in many ways. We are interested in them both for their uniqueness and commonality. We seek to understand them. We would like to hear their stories. (Stake, 1995, p. 1)

Miles and Huberman (1994) were more specific and referred to the boundaries of a case. They believe a case was "a phenomenon of some sort occurring in a bounded context" (p. 25). Their symbolism (see Figure 3.3) clearly showed that "there is a focus, or "heart" of the study, and a somewhat indeterminate boundary defines the edge of the case: what will not be studied" (p. 25). Although we generally see a bounded context as solid, this cannot be said for a case as at different situations or times different items influence the case.
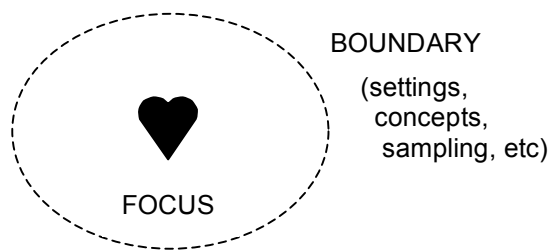
Figure 3.3. The case as the unit of analysis.

Merriam (2001) agreed, stating that "the single most defining characteristic of case study research lies in delimiting the object of study, the case" (p. 27). She suggested we need to "ask how finite the data collection would be, that is, whether there is a limit to the number of people involved who could be interviewed or a finite amount of time for observations" (pp. 27-28) to ensure the case study is clearly defined.

There are difficulties, of course, when looking at a case that is one aspect of a whole school, as it can seem artificial, because we are removing a normally integrated part of a reality and studying it as though it is separated, but it is often necessary to do this to make the research manageable and to focus the research on particular issues of interest. As Bogdan and Biklen (1982) stated, "detaching a piece to study distorts, but the researcher attempts to choose a piece that is a natural existing unit" (p. 55).

The case therefore must be defined clearly from the outset as an entity around which there are definite boundaries, and the case as it sits within those boundaries must be observed. In this study we had an overall case, an "innovative program" (Stake,

1995. p. 2) that ran alongside the general school program and incorporated different techniques for professionally developing teachers in the use of ICT in their classrooms. As is shown in Figure 3.4, there were clearly defined participants in this aspect of the research and although it was a program that was influenced by, and also influenced, many areas of the school, the innovative child-to-adult mentoring program had definite boundaries.
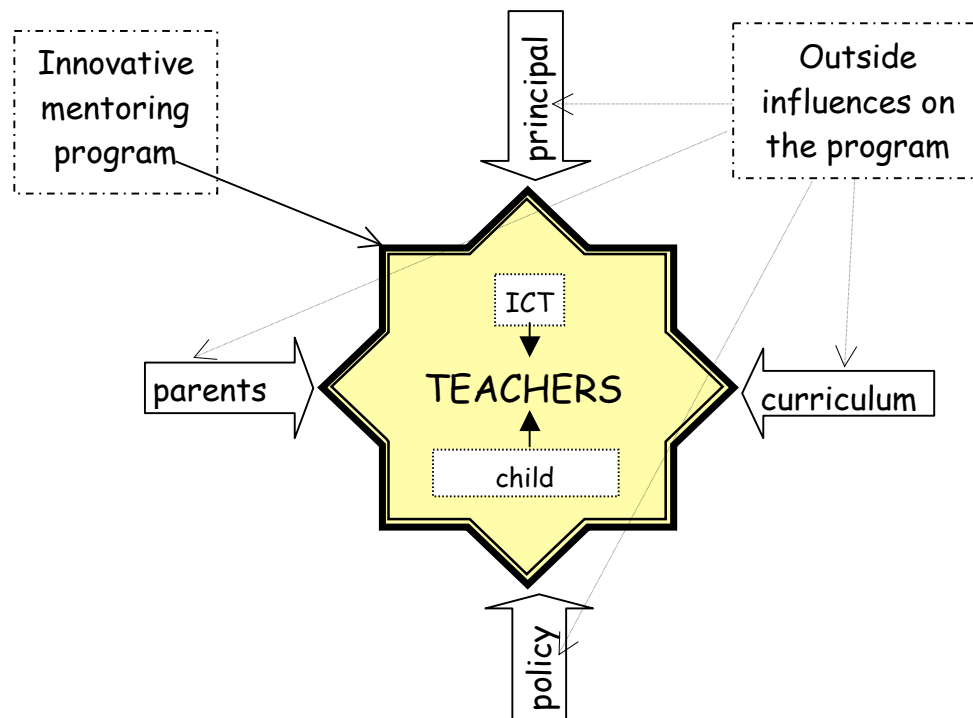
Figure 3.4. Overarching case study, showing key boundaries and influences.

The individual teachers involved in the program also had clearly defined boundaries and a broad range of situations that influenced them, both directly and indirectly, throughout the project. Two of these teachers were chosen for more in-depth case studies to further investigate and elaborate the impact of the program.

The case study then was the exploration of this innovative child-to-adult mentoring program. The case study method was "employed to gain an in-depth understanding of the situation and meaning for those involved. The interest was in process rather than outcomes, in context rather than specific variables, in discovery rather than confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research" (Merriam, 2001, p. 19). Within this context the case-study approach gave an opportunity for the mentoring program to be studied in some depth. To add more depth to the rich description of the mentoring program a

concentrated study was made of two specific teachers. This was done to explore further the case of the mentoring program through the eyes of the participants and assist in clarifying the readers' understanding of the impact of the professional development.

Bogdan and Biklen (1982) discussed types of case studies, each of which shared some similar data collection methods but had different broad foci. In the *historical* case study the focus is on tracing an organization over time, in the *life history* case study the focus is on one person, in the *document* case study the focus is on the actual documents, whereas in the *observational* case study the focus of the study is on a "particular organization … or some aspect of the organization" (Bogdan & Biklen, 1982, p. 55). Thus the observational case study was most appropriate as this research was intended to focus on a particular aspect of teacher professional development. The focus in particular was that of the mentoring program where teachers were mentored by students. As responses varied according to the person and situation they were in, observation of mentoring sessions was vital. This observation was of course supplemented with formal and informal interviews to verify that the researcher's observations gave a true picture of the participants' perspective.

- Observation

Observation was one method of identifying interactive processes. As Yin (2001) stated, "some relevant behaviours or environmental conditions will be available for observation. Such observations serve as yet another source of evidence for case study" (p. 92). While it was easy to observe others, making the observations valid and reliable enough to be used as research data required them to be planned and systematically documented (Merriam, 2001). Direct observations as described in Yin (2001) were used. They ranged from "formal to casual data collection activities" (p. 92). Formally, the researcher was present in the rooms as an observer while teachers and student mentors interacted. Informally, the researcher observed teachers in other situations where it was a more casual observation such as in a group of teachers in the staffroom. To gain the most from the observations, it was necessary to make the researcher unobtrusive so as to minimise the influence on the program.

To ensure efficiency in the observations, Merriam's (2001) checklist of elements likely to be found in any setting was followed (pp. 97-98). The list included physical setting, participants, activities and interactions, conversations, subtle factors and the researcher's own behaviour. The recording of observations was a little more problematic. Ideally this would have been done using video, but the availability of video tools and the complex nature of its analysis rendered it less efficient for this project. Instead, checklists for observation and field notes on a laptop were used. Digital photographs were also taken to refer to in later interview situations. The photographs were used to remind the participants of particular situations and to stimulate their responses.

- <u>Interview</u>

Interviews with participants were needed to provide data on those items that could not be directly observed. This included the participants' thoughts, feelings and intentions, which could not be seen, nor could they be accurately inferred, by observation alone. Participants were asked therefore for their opinions and interpretations to gain that information from their perspective. "Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowledgeable, and able to be made explicit. We interview to find out what is in someone else's mind, to gather their stories" (Patton, 2002, p. 341). Although the participant's perspective was very important, the researcher was also aware that what a participant may say or think they are doing, was not always exactly what was done. All interview data were also supported or challenged by the researcher's observations and the observations of others.

Patton (2002) described three types of interviews: the informal conversational interview; the general interview guide approach; and the standardised open-ended interview. All three types of interviews were used, but the guide and the standardised formats were combined to offer greater flexibility. The informal conversational interview was used at various times when the chance arose to have an unstructured interview with a participant. This form of interview offered maximum flexibility and allowed leads of the respondent to be followed. The general interview guide approach combined with the standardised format was used in the more formal situations when specific questions needed to be asked of each participant. The

interview guide listed key questions but also allowed items to be explored further at the researcher's discretion. These other questions or probes further expanded on topics that the participant raised as important to them, or followed a previously unexpected path (Patton, 2002).

Interviews were designed to elicit the essence of the experience from the participants' perspectives. To do this, the interviewer listened, prompted when necessary, often using artefacts such as photographs and encouraged subjects to expand and describe their recollections of the experience. It was important to find critical incidents on which the participants could focus and elaborate. The interviewer needed to bring out a participant's reflections, understandings, knowledge and theorising.

The right questions were critical in extracting appropriate data. Strauss, Schatzman, Bucher and Sabshin (1981) outlined four question types that could be used to stimulate responses from an informant. They are *Hypothetical* questions, where the interviewer asks a 'what if' or 'suppose' question, the *devil's advocate* questions which challenge the participant to consider an opposing view, the *Ideal Position* questions which ask for a response to an ideal situation, and the *Interpretive* questions which advance a tentative interpretation of a response and ask for a reaction. The use of all four types of questions elicited a broad range of responses during the interview process. The interviewer continually used probes to extract further information about something already asked. This probing sought more details or clarification particularly when the response was silence, single words or incomplete sentences (Merriam, 2001).

In planning the interview structure, care was also taken to avoid multiple questions, which contained more than one question or idea and could confuse participants; leading questions that revealed an interviewer's bias or assumptions; and yes/no questions that impeded the process with one word answers (Merriam, 2001; Patton, 2002).

An interview guide or schedule (Merriam, 2001; Yin, 2001) (see Appendix 4) was used as an outline for the interview. It contained a combination of a few unstructured

topics, and lists of very specific questions listed in a highly structured way. The interview guide provided the structure and focus for the interview.

- Journals

The fact that the interviews occurred at the end of the series of mentoring sessions meant that they relied on the memory of the participants. To assist the participants to remember aspects of their experiences, journals were given to both teachers and child mentors to encourage them to record their thoughts and feelings as close as possible to the time of the experience. The journals were unstructured.

Although case studies focus on data collection through observations, interviews and journals, data collection was not rigid. The data collected led in different directions. Continual reviewing of the data led to further data, either for clarification or exploration of what had already been collected. The opportunity to use many different sources of evidence was a major strength of this case study data collection (Yin, 2001).

With the question defined and the methods outlined, the specific design of the study will now be explained.

3.3 DESIGN OF THE STUDY

The study focused on an innovative model of teacher professional development in ICT. As well as the information gained from the literature review, the research was based on a pilot study, which showed the effectiveness of a different relationship between teachers and students in their teaching and learning of ICT (Gronn, 2005). The study proposed a model where the students in one class became proficient with a new piece of software or peripheral and they in turn acted as mentors for the teachers in their school to develop their proficiency with the software. Mentoring was observed in two different settings to discover its applicability, and the effect it had, particularly on the knowledge, skills and confidence of the teachers involved, and therefore, how it affected their classroom practice.

3.3.1   Pilot study

In 2004, a pilot study was undertaken. The focus of the study was a Grade 5 class who were to mentor the teachers of the school in the use of a piece of software, new to the school, *Inspiration*. The teachers were interested to trial this new initiative, although some staff were sceptical, as Cate's comment shows:

> I wasn't really negative in the beginning but I was wondering whether it would be a success. After going through the process I do believe it has been quite successful and I think it's been successful for everyone, children and teachers. (Cate, interview, 2004)

The pilot called for teachers and students, to think differently about their teaching and learning relationship and to look more to each other as partners in their education. This was not traditionally how the student-teacher relationship was viewed, but once the sessions began, everyone appeared to benefit from this mentoring relationship.

3.3.1.1 Outline

The pilot study investigated the value of this different model of professional development for teachers in their teaching and learning of ICT.

Initially, a Grade 5 class was exposed to the software by the researcher and, under the researcher's supervision, explored the software program *Inspiration*. This continued until the students had a working knowledge of the majority of facets of the program and its possible uses in education. It included four sessions of one and a quarter hours exploring the package and discussing how it could be used in classrooms throughout the school. One session explored the concept of mentors and how this could work in the situation and a further two sessions consolidated and prepared for the mentoring sessions.

The children and teachers were then asked to attend two before-school sessions of 45 minutes each, one week apart. This took the place of a regular staff meeting time. The collaboration between teachers and students began with a session at which one student briefly introduced the program to the staff. Following this session the teachers moved to a computer, with their two assigned mentors. The researcher had only an observer's role.

The students took up the mentoring role and directed the teachers to the *Inspiration* program on the computers, assisting the teachers whenever they saw a need. The researcher observed the effect the roles had on each group of participants including the ways in which students and teachers communicated when the students were in this mentoring role. Three other formal half hour sessions were run over three weeks with the students as mentors and the researcher as observer. The staff then sought out their mentor/s when they had an issue with the *Inspiration* software, but also with technology in general.

3.3.1.2 The mentors

The children relaxed visibly very early into the session and their comments afterwards showed that, although they were anxious prior to beginning, they realised they were capable of the task. Their feelings were often of relief, but overwhelmingly positive. A typical comment spoke of how they were nervous at the start but realised it was not that bad: "It felt good to actually get it over and done with. I was nervous at the start but now because I know I've done one lesson and it was not as bad as I thought it was gunna (sic) be. [I thought] I'd just like forget everything" (Rick, interview, 2004). Rick also commented in the interview that "it was good to get it over and done with because you know what you're going to do next week … the first lesson wasn't as scary as I thought" (2004). This showed that he was really thinking about the process and although he was initially anxious, that soon turned to relief and then confidence as he realised he had something to offer the teachers.

The children were all very positive and their realisation that the teachers were not there to judge them but to learn from them was helpful. As Milly stated in her interview, "I felt kind of nervous at the start knowing that you were going to have to teach a teacher and you might stuff up or something" (2004). As well as the situation being different, the children also did not want to offend or upset the teachers. This was obvious in Gemma's interview statement "I was really nervous because I might sound mean to the teachers and disappoint them or something and it didn't happen and I was happy about that" (2004).

3.3.1.3 The mentees

The teachers too were very happy with the sessions and compared them favourably to other professional development they had attended. They spoke of less expectation and less pressure and enjoyed the children's style of mentoring. They found the children patient and slow moving mentors, who explained items simply, using step-by-step processes and generally catered to the learning needs of the teachers.

The following comments make it obvious that the teachers felt very comfortable with the children's mentoring style: "Far less threatening" (Jenny, 2004); "kids seem to have that acceptance and they don't really care if you know it or not" (Cate, 2004); "The girls were really good and very patient so I could say oh hang on, how do you do that again?" (Clare, 2004); "We were moving more slowly and that is good" (Jenny, 2004); and "step by step instruction was good for me" (Maggie, 2004). The following comment by Nerida seems to sum it all up:

> It enhanced it [my learning] because there was no pressure. Sometimes when you've got adults teaching you things there is this pressure to know exactly what you are doing and with the children teaching you that pressure was taken away because they put it into their steps … kids just have a simple way of explaining things sometimes. (2004)

Overall the pilot study was a positive experience for both students and teachers and encouraged further investigation into a model for students sharing their expertise in technology as mentors for teachers. Both teachers and students responded favourably to the mentoring sessions and were happy to continue. There was improvement seen in both teacher skills and confidence with technology, particularly the program *Inspiration*. There was also a change seen in the children involved. Their initial tentativeness was quickly replaced by confidence and a willingness to help others with technology. This project was foundational and set directions for the larger doctoral study undertaken and forms the basis of this thesis.

3.3.1.4 Data collection

During the pilot study, data collection consisted of journals, interviews and entry and exit questionnaires, from both teachers and child mentors. The researcher's observational data were also included. Each of these data sources provided useful information in the pilot study, so the decision was made to use similar data collection items in the main study. Incidental data collected in the form of emails from child

mentors were not seen as appropriate in this instance as the focus of the research question was the teacher.

The experience of, and positive response to, the pilot study enabled it to be used as a basis for further research into the area of children as mentors to teachers in ICT. It was in fact the foundation for this larger study and was valuable when developing the assumptions that underlie the child-to-adult mentoring model.

3.3.2 The model of professional development

As discussed in the literature review in Chapter 2, a new set of assumptions that underpinned the child-to-adult mentoring model was proposed and these were used as the basis for this doctoral research. These assumptions were used to assist in the setting up of the program of child-to-adult mentoring within the two schools.

The model for the professional development of teachers, utilizing the skills and confidence of the children in their school, included the mentoring sessions being held initially out of the classroom situation. The teachers were also encouraged to call on their student mentors at times of need. This was one of the most powerful features of this model as it allowed teachers to get "just in time" assistance which was crucial to their continuing the experience of ICT in their classrooms (McKenzie, 1991).

The time periods for the mentor relationships were to be varied, but each relationship between teacher and mentors was to be ongoing. The participants were encouraged to cover items as necessary and then to go to their classroom to experience them. If only a five-minute session was needed at a given time, that was all that needed to occur. Mechanisms for sharing and feedback were included at the beginning and end of each session when teachers were expected to share what they had been doing in their classroom with the new skills they had acquired.

The climate of the mentoring sessions and the relationship between the teachers and child mentors needed to be one of trust and collegiality. Teachers were used to having the students trust them, but in this program the tables were turned and teachers needed to let their guard down and allow the students to see their "failings". This was not something for which preparation was easy, but it was hoped that once the initial contact was made and the first piece of assistance/information was passed

between the mentors and mentees, they would realise that they were both there for the same reason and the collegiality would become apparent.

The mentors needed to develop a range of skills themselves. Within the sessions with the 'expert' teacher or researcher, the students were encouraged to develop skills not only with technology, but also in mentoring. These included the communication skills of clarifying, phrasing, conflict management and listening. Also necessary for successful partnerships were the skills of observation and providing feedback. These skills were discussed with the students during the initial sessions prior to contact with the teachers.

Mentors were also made aware that the teachers were all different and that the things that interested the teachers would depend on the grade level that they were teaching and their experience with ICT. Child mentors were encouraged to go off on "tangents" if it was necessary, and to allow teachers to ask questions and direct the session so that it was useful to them. The person coordinating the mentors used examples from the children's own learning experiences to explain many situations that might occur. It was noted in the pilot study that this was a surprise to the student mentors. Some children just expected the teachers to sit and do as they were told. As James stated: "Today I was pretty annoyed with Mrs Smith because she kept on exploring around" (Gronn, 2005). This was certainly something that was learned from the pilot study that needed to be explained to the children during the pre-mentoring training. They were allowed to let the teachers explore to a certain extent. Of course the difficulty then was how to get the teachers to return to the focus of the sessions.

Administrative support, as with any professional situation was needed for this project. Along with the permission of principals of the schools involved, came the understanding that at various times throughout the project the mentors and mentees would need time to get together, whether for assistance or clarification of an issue. Principals and support staff were very obliging in this area.

In both schools in the larger project, discussion was held to decide the exact focus of the professional learning so that it was applicable to each school and its individual teachers. Both schools decided the focus should be on digital cameras and related software.

Initially the children were exposed to the digital cameras and related software by a school staff member or the researcher and, under their supervision, they explored these technologies until they had a working knowledge of the majority of their facets and some of their uses in education. This was expected to take up to eight hours in total over a four-week period. Intertwined with this digital camera and related software exposure for the children were focused discussions on what it meant to be a mentor.

The collaboration between the majority of the staff and children began with a session at which the children, in pairs and sometimes trios, introduced the staff to the digital cameras. This was done at Mountaintop in a staff resource room and at Hillside in the staffroom. It was expected that the staff would form bonds with one or two children and that a working relationship would develop between the pairs or trios of children and their assigned mentees. This working relationship was fostered both inside and outside of the classroom in both schools.

3.3.3   The research

The interaction between children and staff was observed at these mentoring sessions. The children took up a mentoring role assisting the staff whenever the staff members saw a need or in some cases when the children saw a need. The effects that the roles had on each group of participants was observed, including the ways in which children and staff communicated when the children were in this mentoring role. A total of three formal 30 minute sessions were run over three weeks with the children as mentors and the researcher as observer. It was proposed that the staff would then seek out their mentor/s when they had an issue with the digital camera or related software, but also with technology in general. This occurred for many mentoring groups across both schools.

The focus of this research was on the experiences and perceptions of the teachers as they progressed through the program and beyond. Observations of and interviews with the teachers were made. Teachers were also encouraged to write journals of their participation. Dependent on the individual teachers, a range of options for these journals was available from dot points through written stories to drawings. There was

a focus on the personal narrative of these participants, and how they best imparted their story depended on the individual.

As well as the teachers, the student mentors had a story to tell. They kept journals throughout the mentoring project and were interviewed as a group after each session to gain their insights into how the sessions and their teacher mentees were progressing. The students were also individually interviewed at the conclusion of the mentoring sessions. Data obtained from the students were useful for triangulation of teachers' responses.

Interviewing the main stakeholders in the school, such as the principal and coordinator, to gain information regarding the school setting, and their perceptions of the participants within the program, was important. These perceptions allowed a more rounded view of the setting in which the program was running, and also of the actual participants and any changes in their skills, confidence and classroom practice.

Interpretation of the data took various forms. These were applied throughout the data collection to inform the direction of further interviews. More thorough data analysis was undertaken when all data were collected. The focus was then on finding similarities, differences and relationships within the various data sources.

3.3.4   Timeline

Data were collected at the sites for one school year, following the participants until Term 4, as shown in Table 3.1. Observations and interviews were conducted as required.

Table 3.1
Project Timeline

Time	Action
Term 1, 2006	• Met with principal and coordinator and reviewed available documents to get the background and details of the site and participants. • Interim analysis occurred here to inform the observations and interviews to follow.
Term 2, 2006	• Digital cameras and associated software were chosen as the ICT professional development focus for both schools. • The participant group was decided on, including the mentor group and the mentees. Informed consents were sent out and collected from all participants. • It was decided at Mountaintop that the classroom teacher would be the principal support for the mentors with the researcher assisting. At Hillside the researcher was the principal support for the mentors. • Mentors and mentees completed questionnaire. • The program began with researcher observing and interviewing as appropriate. • Further interim analysis occurred.
Term 3, 2006	• Continued observation and interviews. • Further interim analysis occurred. • Final questionnaire.
Term 4, 2006	• Continued observation and interviews. • Further interim analysis occurred. • All data collated and final analysis began.
2007 - 2008	• Data analysis continued. • One year later survey completed by teachers. • Thesis writing began and completed.

3.3.5 Target group – Selection of participants

Within the case study method, selection occurred at two levels. Initially, the main case was chosen. For this research the main case was a unique model of ICT professional development where students mentored teachers.

The selection of the group of child mentors was influenced by the researcher, most importantly by stating the preferred grade level of students required (Grade 3, 4 or 5). These students were aged from 8 to 11. This was done to satisfy the requirement that the students would be at the school for more than one year of the project. The number of students involved also narrowed at Hillside as the project progressed. The class involved had eight Grade 4 students and eighteen Grade 3 students and a small computer lab in which to work. It was decided that the researcher would work with the eight Grade 4's only and that those eight children would mentor the Grade 3 students in their class, as well as various teachers within the school. Each Grade 4

student was then paired with a Grade 3 child and generally took the lead in the mentoring sessions with the teachers. Not all Grade 3 students were involved in the final mentoring, as teacher numbers did not permit this.

Initially teachers registered an interest in being involved in the project and all who applied participated. Once the initial mentoring sessions had begun, two teachers within the case who demonstrated a range of prior experiences, apparent capabilities and learning styles were identified. This provided interesting contrasts for the research. The reasons for the choices are further developed in Chapter 5. Figure 3.5 illustrates this selection of participants. First there is the ICT Mentoring Program (the hexagonal bounded area) and within that the two school sites that were involved. Initially there were three schools that agreed to participate, but timetabling difficulties dictated that one school was no longer available.
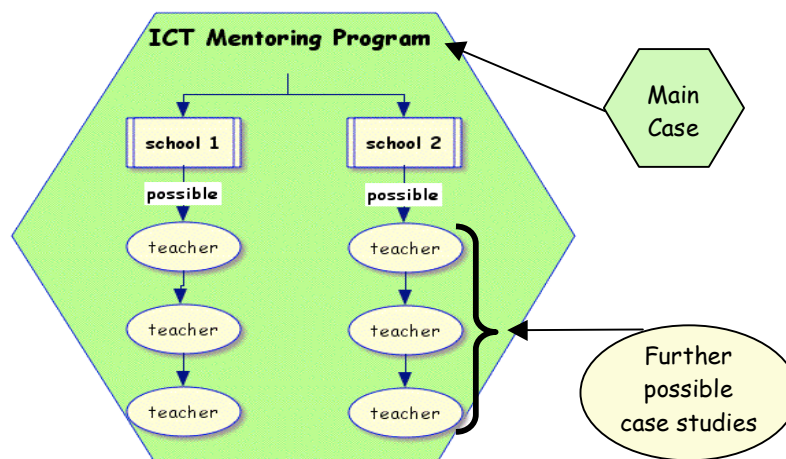
Figure 3.5. The cases involved in the study.

It was important for the researcher to be immersed in the school sites before a decision could be made on possible individual teacher case studies. At the same time the focus was on the research question and how individual teachers' experiences could inform it. By second term, basic insights had been gained from the interviews with the principal and coordinator, the questionnaires, and initial researcher observations of the participants and sites. Teachers involved provided further data through observations and interviews. During the initial observations and interviews, participants were asked for recommendations of other participants they felt would be suitable for interview. This was described by Merriam (2001) as snowball, chain or network sampling, a form of purposeful sampling. It was "based on the assumption that the investigator wants to discover, understand, and gain insight

and therefore must select a sample from which most can be learned" (p. 61). The cases for study were therefore selected based on both the researcher's observation and the recommendation of others. Participants were chosen primarily because they were part of the experience being investigated and could share their thoughts and feelings about the experience. The main sample included, teachers, students, coordinator, school principal and possibly parents, but the final case studies were of classroom teachers only since the focus of the research question was the teachers' perceptions.

To thoroughly investigate these cases, a range of data collection methods needed to be utilised. As indicated earlier, questionnaires, observations, interviews and journals were used. Other informal data were also collected through filed notes. The following section elaborates on the data collection methods seen as most appropriate, and their purpose in this research.

3.4 DESCRIPTION OF INSTRUMENTS

Case study analysis allows a broad range of data collection instruments. In this research, questionnaires, observations, interviews and journals were the main sources of data.

3.4.1 Questionnaires (Appendices 1, 2, 3)

There were separate questionnaires for teachers and students. Although the teacher was the main focus of this research, it was valuable to have data from the student mentors as this provided data which could be used to support teacher data collected.

The student and teacher questionnaires had six sections in common:

1. *About You* – collected census data giving background information;
2. *Computers and You: Attitudes and Confidence* – collected data on feelings and willingness towards ICT;
3. *Computers and You: Skills* – collected data on perception of skills with software and peripherals on a rating scale;
4. *Computer Facilities and Use: At Home* – collected data on facilities available and used in the participant's home;

5. *Computer Facilities and Use: At School* – collected data on facilities available and frequency of use in the participant's classroom; and

6. *Any Other Comments* – collected general data on why participants did or did not use computers.

The teacher questionnaire contained an additional section: *Computers and You – Background* that enquired into the professional development background in ICT of the teacher participants.

While the teachers completed their questionnaires at staff meetings, the method of delivery of the questionnaire to the students was face to face in a class group so that, should any issue of interpretation occur, points of difficulty could be explained. Teachers were also asked if there were any students with language or reading difficulties that may need assistance in the comprehension of the survey. Field notes were taken on any incidences of assistance.

3.4.2   Observations

Observations were formal and informal depending on specific evidence, or for new insights into the professional development program. The researcher completed observations alone, apart from five sessions when an associate sat in on the sessions. An observation schedule (see Appendix 5) and checklist were used in each session. They assisted in directing observations in certain areas but also allowed a place to record certain observations, as well as questions for later interviews. Observations focused on the relationship between teacher mentee and student mentor and the characteristics observed within this relationship as well as the teachers' attitudes, knowledge and skills during the sessions.

3.4.3   Interviews

In the case study method, the main instrument for data collection is often the interview. In this project, as well as incidentally, interviews were conducted after the completion of the series of mentoring sessions. The researcher interviewed each teacher and child individually. An interview guide (see Appendix 4) was used as a focus but interviews were semi structured thus allowing for greater flexibility. The focus of the interviews for teachers was to gain their impressions of the sessions and

program overall and to allow them to verbalise the benefits of the program. The student mentor interviews were shorter than the teachers' interviews and were also unstructured. This allowed student mentors to discuss their observations and feelings of the project in a one-to-one situation.

Incidental interviews occurred in staff rooms and playgrounds with both teachers and students. They also occurred with the student mentors after each mentoring session when they were eager to discuss the progress of the sessions and their teachers, and to reflect on how the program was impacting on all involved.

During the interview it was impossible to write or remember all responses to questions and probes, so the formal interviews with participants were digitally recorded and notes were taken throughout the interview to prompt further questions or to serve as a reminder for follow-up. The recordings were later transcribed as a review of the interview and for further analysis. The transcribed and handwritten notes became part of the field notes.

3.4.4   Journals

Teachers were encouraged to write in journals. These were private and only shared with the researcher. Many teachers used the journals to record notes during the sessions as well as commenting on their knowledge, skills, confidence and classroom practice. They were also encouraged to comment on their feelings at various times in the project. It was requested that teachers write as soon as they completed a mentoring session so that items were fresh in their minds, but this was not always possible due to other commitments. It was recommended that teachers present their writing in whatever format was most useful to them in recording their perceptions of the sessions. As well as perceptions of the actual sessions, staff were also encouraged to write of the effect the sessions had on them, as one teacher in the pilot study said, "I went home and told my husband about it and told him how it changed my perception of the children" (researcher notes, 2004).

The students had journals also. Their journal was a focus for recording their learning in sessions prior to the mentoring, but also a place for them to include any notes or feelings on how a session went and what they intended to follow up in the next

session. The journals provided data on how the students perceived the sessions and the teachers' progression.

3.5   ANALYSIS

The data were analysed following the components of a data analysis flow model as described by Miles and Huberman (1994) (see Figure 3.6). This model showed "three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification" (p. 10). As part of the initial data reduction it was anticipated that there would be qualitative and quantitative data and these were identified. This enabled two separate computer programs to be used for analysis. The majority of the data, being qualitative, were analysed in *NVivo* (QSR International, 2005). The quantitative data were analysed in Microsoft Excel.
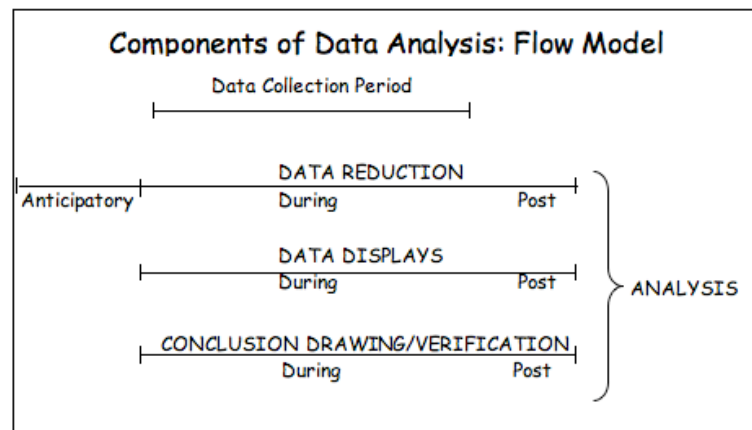
Figure 3.6. Components of data analysis: flow model.

3.5.1   Data reduction

Data reduction refers to the process of selecting, focusing, simplifying, abstracting and transforming the data that appear in written-up field notes or transcriptions. As shown in Figure 3.6, some data reduction occurred prior to the data collection period. This was the anticipatory data, for which the design of the project catered. Certain data types were seen as most useful for this project, so were selected in the beginning. Video recording of sessions was not seen as logistically possible so audio recordings were taken in preference. The other data types selected have been described previously. The most obvious reduction of data was in the selection of schools, teachers and students for the project which has been described in the section on Target group - Selection of participants 3.3.5.

Data reduction also occurred during the project as data were collected. Due to the variety of collection techniques there was a wide range of data. The data were sorted into quantitative and qualitative for analysis.

3.5.1.1 Quantitative data

Data from the questionnaires that could be quantified such as competence ratings were coded and entered into Excel. These data were then reduced using graphs and statistics such as means and percentages; they are reported on and displayed in Chapters 4 and 5.

3.5.1.2 Qualitative data

The data were predominantly qualitative. These qualitative data were transcribed and placed in *NVivo* where reduction began using coding. This allowed the researcher to code the survey (qualitative sections), journal entries and interview text against the nodes created from the features underpinning the mentoring relationship and the research question, thus allowing the data to be searched, linked and modelled for greater clarity.

Prior to the commencement of data collection, a list of descriptors sourced from the mentoring literature was sorted into items that affected the mentor (child), mentee (teacher), and the relationship between the two. The mentee descriptors were then organised into traits that related to personal characteristics and those that related to personal learning preferences. These groups were further refined to become a list of features underpinning a quality mentoring relationship (see Figure 3.7). This list was constantly referred to throughout the data collection and provided the initial focus for qualitative data analysis.

Mentor (C=Child)	Mentee (T=Teacher)	Relationship betw. mentor and mentee (R= Relationship)
C1. Charactereristics	T1. Self as a learner	R1. Good rapport between mentor and mentee
C2. Learning environment [manner of interaction]	T2. Relationships	R2. Trust and confidentiality
C3. Approach [How they teach]	T3. Approach to project	R3. Clear objectives and goals
C4. Interaction–explanations [How they tell - content model]	T4. Reactions with mentor	R4. Mutual respect
C5. Interaction–discourse [How they encourage learning- foster interaction]	T5. Take control of learning	R5. Clear communication and feedback
	T6. Persistence	R6. Physical environment comfortable
	T7. Making choices	R7. Shared experience
C6. Planning	T8. Approach [doing]	R8. Acknowledgment and celebration of achievements
C7. Management		R9. Others are aware and supportive
C8. Relationships between mentors		R10. Locus of control

Figure 3.7. Features underpinning a quality mentoring relationship.

Tree Nodes (see Figure 3.8) were set up in *NVivo* based on these features and data were coded against them. As this analysis took place, further characteristics emerged that had not been obvious in the literature. Any items that were deemed interesting, but did not fit the current set of Tree Nodes as developed from the literature, were placed in a newly created Free Node (see Figure 3.8). Some of these items were then integrated into the Tree Nodes upon further analysis, but some new items stayed as Free Nodes.
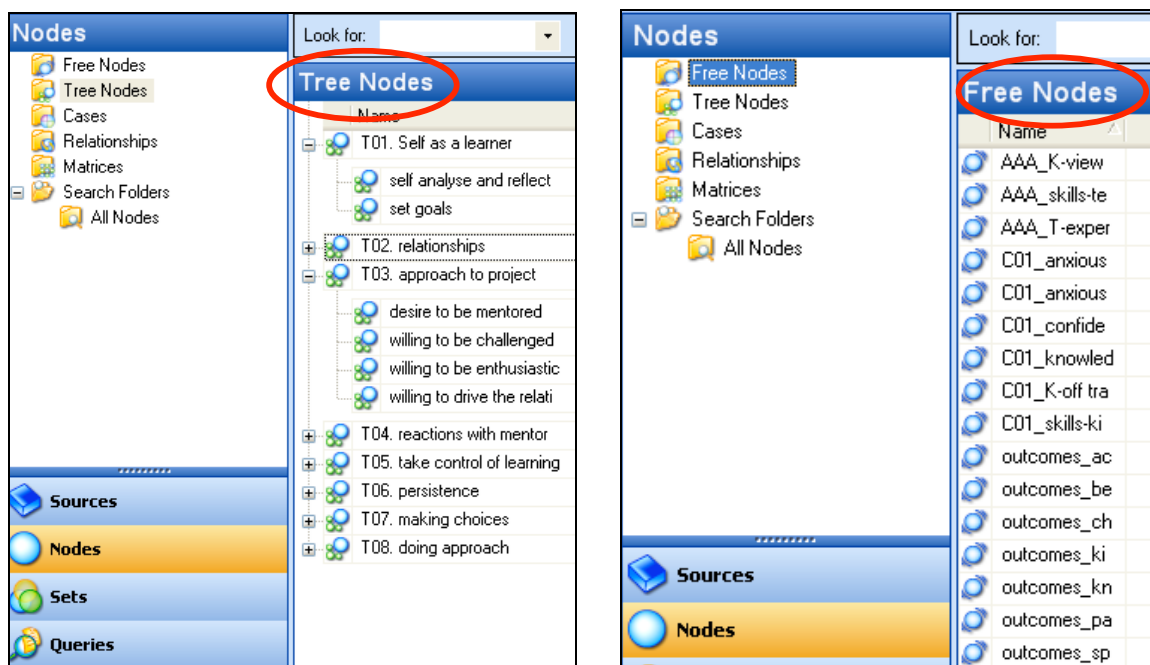
Figure 3.8. Example of the tree node and free node structure in NVivo.

Later the teacher-reported data (interviews and journals) were also coded against the key components of the research question (see underlined italics in Figure 3.9). This was initially done for all interviews from one school and analysis of this small group

was undertaken. The data were clustered together under the main branches of the Tree Nodes and extensions of the branches were formed for the particularly large items, thus refining the data. Input from others was sought at this stage to ensure no items were missed. Word frequency searches were done on the documents to further explore specific items that arose from the data and to extrude data that related specifically to the research question. This added a new collection of Free Nodes for analysis.

> What *benefits* of student mentors in ICT do teachers report? In particular what is the perceived effect of this approach on the teachers' *skills, confidence* and *classroom practice* with ICT?

Figure 3.9. Key components of the research question.

Having developed various topics from the data, which had been abbreviated as codes, the data were reanalysed to confirm initial analysis and to see if any further new codes emerged. During this process, data were displayed as diagrams to give a visual view of the data and their connections within the project. All codes were sorted within the characteristics relating to teachers, mentors and the relationship between the two, and preliminary analysis on material belonging to each theme was performed. The data were then recoded as necessary (Tesch 1990).

After initial analysis, to confirm consistency of descriptors and coding and in order to assist in the validity of the study by negating researcher bias, the researcher along with two colleagues coded common pieces of interview data. It was realised that the data proved to be ambiguous in relation to some features and open to different interpretations by different coders. When the coding was discussed it was found that differences between the three academics' coding results were related to ambiguities in understanding the separation of the terms, and also the terms not being distinctly separate in the child-to-adult mentoring situation. It was often found that some teacher comments were rated to two similar features. This seemed to indicate that there wasn't a distinction between some items in the list for the child-to-adult mentoring situation.

These observations and analysis led to the refinement of the original features as found in the literature, to a more specific set of features underpinning a quality mentoring relationship within the child-to-adult mentoring model (see Figure 3.10). Although the original features were initially used to distil the data and assisted to

clarify the roles of the participants throughout the research, the new refined set of features was more pertinent to the child-to-adult mentoring model. The experts therefore coded a new data set to the refined list of features and found they were in agreement.

This analysis also led to the refinement of the assumptions underpinning the development of a mentoring professional development model as discussed in Chapter 6.

Mentor (CM=Child)	Mentee (TM=Teacher)	Relationship between mentor and mentee (RB=Relationship)
CM1. Personal characteristics	TM1. Self as a learner - specific	RB1. Good rapport
CM2. Learning environment		RB2. Shared experience
CM3. Chosen teaching style	TM2. Approach to project	RB3. Acknowledgement and celebration of achievements
CM4. Relationship between mentors	TM3. Take control of mentoring session	
	TM4. Learning style	RB4. Locus of control

Figure 3.10. Features underpinning a quality relationship within the child-to-adult mentoring model.

A descriptor of each feature was developed to assist in clarity of inter-rater reliability of coding. These descriptors are outlined in Table 3.2. The features, their refinement and descriptors are further detailed in Appendix 6.

Table 3.2
Feature Descriptors

Child mentor	
• Personal characteristics	The personal characteristics that the child mentors exhibited in and around the sessions. They are a feature of the project as they influenced the whole atmosphere of the project.
• Learning environment	The type of learning environment the child mentors set up for the teachers.
• Chosen teaching style	The way the teaching was structured and how the student mentors encouraged the teachers in their learning.
• Relationship between mentors	The way the child mentors worked together. How they shared the role of mentor and assisted each other in the mentoring.

Teacher mentee	
1. Self as a learner - specific	The way the teachers saw themselves as learners. The features they brought to the project that influenced the way they approached it and responded to the project and the child mentors.
2. Approach to project	How the teachers approached the project. The attitudes they brought to and carried through the project.
3. Take control of mentoring session	How the teachers handled the perceived loss of control in the mentoring situation and whether they exerted an influence on the sessions by their subtle manipulation of the children through questioning and other techniques.
4. Learning style	How the teachers preferred to learn.

Relationship between mentor and mentee	
1. Good rapport	How the mentee and mentors were able to work together.
2. Shared experience	The value of the experience as a shared learning situation for both mentor and mentee.
3. Acknowledgement and celebration of achievements	How the achievements of both mentees and mentors were valued and encouraged throughout the sessions
4. Locus of control	Focuses on who is in control of a situation. This is not just about who is using the equipment, it is more about who is leading the session, directing the progress of the session.

3.5.2   Data display

During data reduction, data displays were created, examples of which are shown in Figure 3.11 and Figure 3.12. These assisted to organise and compress information to permit clarification, conclusion drawing and action. Commonalities were sought in the data, as well as connections between the model and features, both original and emerging.

Figure 3.11. Example of data display: Free Nodes and how they fit with the research question.

nodes-v-teachers		A : T1.01...	B : T1.0 ...	C : T1.10...	D : T1.11 ...	E : T1.03 ...	F : T1.04 ...
71 : C01. Mentor Ch...		11	0	4	5	5	7
72 : C02. Learning e...		5	0	1	0	1	2
73 : C03. Approach -...		7	0	2	3	3	4
74 : C04. Interaction ...		8	1	2	4	3	5
75 : C05. Interation ...		7	0	1	1	1	2
76 : C06. planning		2	0	0	0	0	0
77 : C07. management		1	0	0	0	0	0
78 : C08. Relationshi...		8	0	3	3	4	4
79 : R01. Good rapport		5	0	1	1	2	2
80 : R02. Trust and c...		1	0	0	0	0	1
81 : R03. Clear objec...		0	0	0	0	0	0
82 : R04. Mutual res...		1	0	1	0	1	1
83 : R05. clear com...		4	0	0	0	0	0
84 : R06. Physical en...		0	0	1	1	1	0
85 : R07. shared exp...		5	1	1	2	2	2
86 : R08. acknowled...		1	0	0	1	0	0
87 : R09. Others are ...		1	0	0	0	1	0
88 : R10. locus of co...		6	0	3	2	6	2

Figure 3.12. Example of data display: Frequency of nodes by teacher.

As described by Miles and Huberman (1994, p. 41), links within qualitative data and between qualitative and quantitative data were also made (see Figure 3.13). This assisted in the:

- confirmation and corroboration of the data via triangulation;
- elaboration and further development of the analysis; and
- initiation of new lines of thinking.
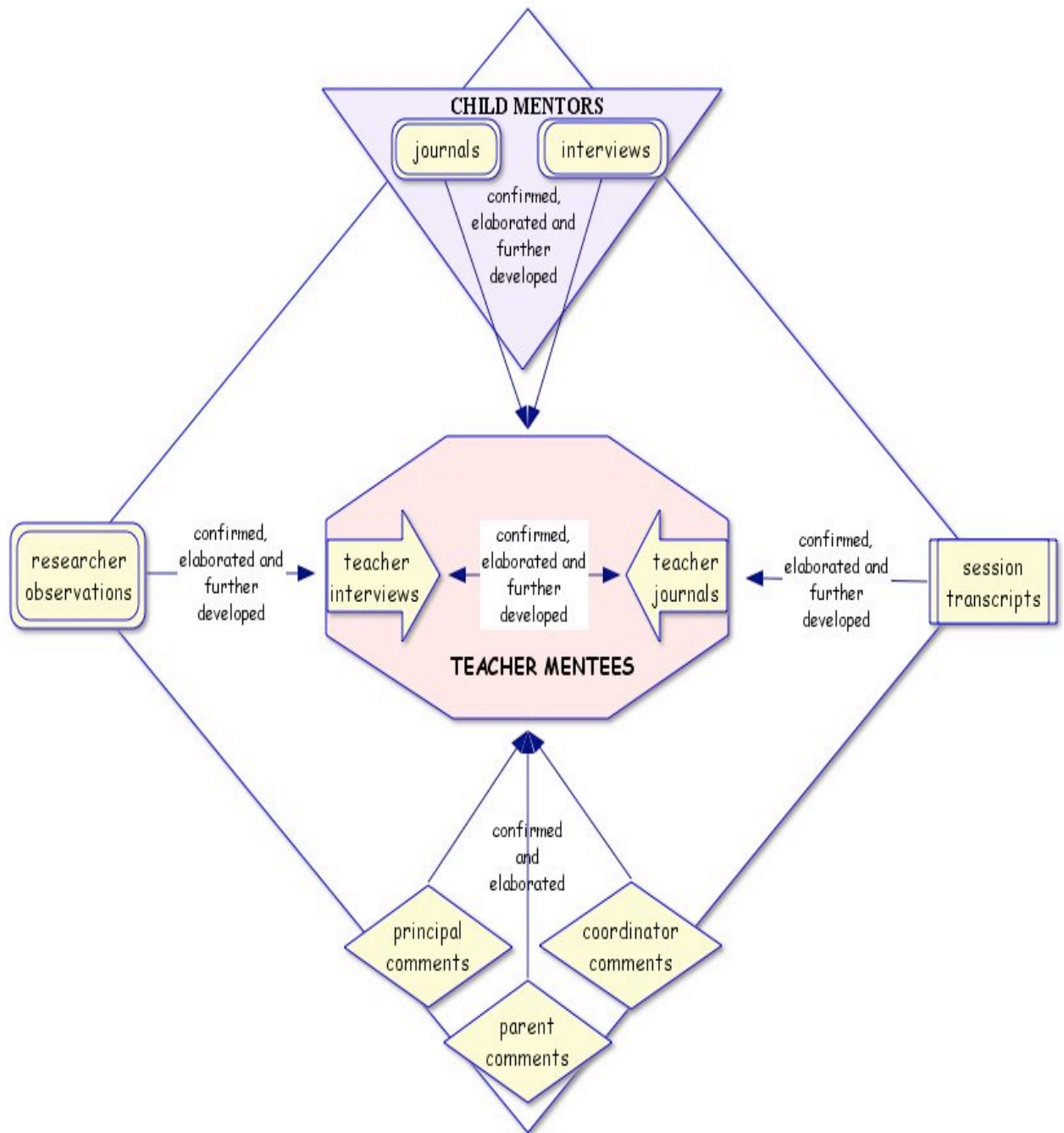
Figure 3.13. Links within and between the data.

Examples of these are: the use of teacher journals and session transcriptions to confirm teacher interview data; researcher observations and children's interviews and journals to corroborate teacher reported data; and the use of session transcripts and researcher observations to elaborate on the initial teacher reported data leading to the development of richer data. Matrices were also created in *NVivo* with various data sets to create a different view of the data, thus promoting new lines of thinking. This was particularly useful in the development of similarities and differences between teachers in the project.

3.5.3   Conclusion drawing/verification

Finally, conclusion drawing/verification took place where decisions were made as to the meaning to be drawn from the data. The data were analysed in a variety of ways depending upon the source. The following section describes the specific analysis of the various data types.

3.5.3.1 Questionnaire

The majority of the data from the questionnaire were used for pre- to post-comparison. As the same questionnaire was used pre and post the research, some of the data were repetitive. The questionnaire contained both quantitative and qualitative data and these were analysed differently. The quantitative data were converted to numeric format and inserted into *Excel*. These data were compiled to give facts, relationships, and causes and effects occurring between variables. Initially frequencies, percentages and means in each category were analysed then after the post questionnaire some responses were analysed for change over time.

A range of output displays was created to show the various data. These took the form of tables and graphs. The small amount of qualitative data also collected in the questionnaires were collated, coded and distilled for later use.

3.5.3.2 Observation

Observation occurred throughout and the data collected were in the form of checklists and field notes. These were under continual analysis as trends emerged during observations. The digital audio and researcher's field notes collected from the mentoring sessions, including memos from during and after sessions were transcribed and imported into *NVivo*. They were coded against the features underpinning a quality mentoring relationship and used in triangulation and elaboration of teacher reported data in the analysis toward the research question.

3.5.3.3 Interview

Informal interviews were spread through the project. Formal interviews of 30-45 minutes were held with teachers after the mentoring sessions. All interviews were recorded on a digital recorder and transcribed. The children's interviews were 10-15

minutes long. Repeated listening provided memos in the form of notes and quotes from these files.

Initially the types of data collected were coded and distilled. In this process all data were listened to or read to provide a sense of the project as a whole. All interview files were analysed as described earlier using the computer package *NVivo*.

3.5.3.4 Teacher journals

Teacher journals used throughout the project were collected at the conclusion of the project for textual analysis using the same approach through *NVivo*. The journals were minimal in content compared to the interview data, but as they provided observations and explanations made by teachers at the time of the session, what was written was valuable for use in triangulation and elaboration of the data.

Once all data had been analysed, an evaluative summary was prepared to explain the key themes exposed by the data. Specific Analytic Techniques outlined by Yin (2001), including *Explanation Building* where the "goal is to analyse the case study data by building an explanation about the case" (p. 120) were used. Causal links and plausible and/or rival explanations were identified in an attempt to construct an explanation of the case. The interpretation of the data was intended to tell the story of the ICT mentoring process from the teachers' perspective. Finally conclusions and recommendations from the research were written.

3.6   LIMITATIONS OF THE STUDY

3.6.1   Contextual settings

The limitations of the study included the contextual settings in which the study took place such as the particular schools and participants. Although the selection of schools was made by the researcher to show a range of contexts, it was limited to schools that expressed an interest in involvement and that were logistically viable. The selection of participants was to be inclusive of all staff who wished to be involved, and the selection of students was made for convenience reasons. It was understood that the findings of the research were applicable only to the schools, teachers and students who participated. However, given that two schools of different

sizes and technology facilities were chosen, perceptions and experience of participants may provide some insights into the value of this model for other schools.

The relationships within the social situation were also a limitation of the study. As the relationship between any two people varies dependent upon the individuals, so these relationships varied dependent on the choices of combinations of people. Teachers placed with a particular mentor may have reacted differently when placed with an alternate mentor. The number of mentoring relationships being explored was fairly large in the restricted environment in an attempt to constrain this limitation. The main focus of the study was not the relationship but rather the effect perceived by the teachers.

3.6.2   Teachers

The selection of teachers was different in each school so this too could be seen as a limitation of the study. At Mountaintop, the teachers were given the option of joining the project. This leads to many questions regarding the teachers' reasons for choosing to participate in the project. This could cause bias in the study, as reported reasons are not necessarily the real reasons. At Hillside, all teachers were required to participate. This raises the issue of whether the requirement to participate tainted the teachers' reactions and comments. Although it was understood that these were limitations of the study, the data did not seem to be influenced by teacher selection once the mentoring began and the extent of agreement between data from different sources supports this.

3.6.3   Students

The selection of students could also be seen as a limitation of the study as they were selected on the basis of teacher availability and the good will to have their class involved. Although the researcher was initially keen to have a whole class of Grade 5 students involved, due to the prevalence of composite Grade 5/6 in both schools it was decided that Grade 3/4 would be targeted. The selection of this level of children also meant that the findings may only be applicable to children of this age level.

As this study was focused on the teacher, this leaves the whole aspect of student learning to be considered. Although the students were mentoring the teachers, this

research was focused on the teacher and their response to this mode of professional development. The abilities and view of the students were obviously important in relation to the teachers, but the students and how this mentoring process affected them and their learning was not the focus of this research. It was obvious that questions and areas of interest arose during the research that were not suitable to pursue in this particular project, but the impact on the students is a future area of research.

3.6.4 Technology focus

An additional limitation of this study was that of the technology to be studied. In order to disrupt the schools as little as possible, the choice was given to the schools as to which technology would be the focus of the study. Both schools chose digital cameras, as they were items that the schools were about to purchase so the professional development was appropriate for those items at that time. This of course brought limitations as the findings are seen as applicable only to the specific items studied. It was intended that the actual technology not be the focus of the study, but rather the teachers' perceptions of this approach on their skills, confidence and classroom practice which included the relationship between the mentor and mentee.

3.7 THREATS TO VALIDITY

Many researchers find it easy to criticise case study research as not rigorous. To establish validity of the data in a case study, a range of strategies has been suggested (Merriam, 2001, Miles and Huberman, 1994; Yin, 2001). Five main strategies were used in this project:

1. Researcher's biases: The researcher made interpretations and defined the conceptual scheme at the outset of the study. The researcher also sought the assistance of colleagues to confirm consistency of descriptors and coding. This was done when the researcher along with two colleagues, experienced qualitative researchers, coded common pieces of interview data. This led to the refinement of the features of the people and relationships in the child-to-adult mentoring program. The features refinement and descriptors are elaborated in Appendix 6.

2. Triangulation: This is a popular strategy to enhance validity of data (Yin, 2001). Because of the range of collection methods the data from this project

were relatively easy to triangulate. For example, when gaining information regarding each teacher's confidence with computers, there were data from the teacher questionnaire, the researcher's observations, the children's observations, the teacher interview and in some cases the principal or coordinator's interviews. Each piece of data strengthened the original data. Although some data may have arisen that questioned previous data, this was very rare. It was therefore possible to validate each situation by combining different ways of looking at it. As Yin (2001) stated, "any finding or conclusion in a case study is likely to be much more convincing and accurate if it is based on several different sources of information" (p. 98). Triangulation also strengthened reliability.

3. Participant validation: The original data and the researcher's interpretations were taken to the source participants to confirm with them that their data had been correctly interpreted. This ensured biases did not distort the data from the participants' perspective.

4. Reliability check: To check consistency in the data, it was necessary to confirm all data were collected in a similar way. As there was predominantly only one researcher in the field in this research, one person collected the data, and there was no real issue with multiple investigators. There were five mentoring sessions at which a second researcher was present, but that was under the full supervision of the researcher to ensure consistency of approach.

5. Credibility/authenticity check: The descriptions were context rich, meaningful and comprehensive so the findings made sense, were credible and offered an authentic picture of the teacher professional development program.

3.8   ETHICAL ISSUES

It was important to protect the participants in the research project, as they may have felt pressured in a school situation to respond to items they would not normally discuss and also talk about things they didn't intend to reveal. Within this research, the participants were aware that they may end their participation at any time. Although one teacher did withdraw from the project, it was due to ill health, not any ethical issue.

Pseudonyms were used for the teachers, students and schools in this project to further protect the participants' identities. As part of the ethics clearance approved by the university ethics committee, there were also details of professionals to whom referrals could be made if any discomfort was caused to the participants. This was not required. The data gained from this project have been used only in the ways stipulated in the plain language statement presented to all participants as part of their informed consent package.

3.9   SUMMARY

This research, as diagrammatically outlined in Figure 3.14, was based in the Constructivist/Interpretative Paradigm, which encouraged qualitative methodologies. Although qualitative data were the main focus of the research, a survey method was also included to gain pre- and post-information from participants. A case study method was used to focus on the participants in a professional development model where teachers were mentored by students in the use of technology. Observation and interview facilitated the main data collection, but there was also some document analysis used as supplementary data to gain a richer picture of the unique professional development model. The data collection was carried out over one school year and the individual case study participants were selected during that time through both researcher observation and the recommendation of others in the project. The data collection was informed by continual data analysis thus allowing the project to be informed by the activities of the participants. Awareness of the issues regarding validity and ethics for the case study were at the forefront and a range of techniques was used to minimise the effects of both. The final results of the research were presented with pseudonyms used for all participants to protect their privacy.

Figure 3.14. Outline of the research.

CHAPTER 4

CHILDREN MENTOR TEACHERS

"I hope the teachers are ready to be blown away by their mentors"
(Mountaintop coordinator, journal, 11/07/2006).

This project was designed to investigate the benefits teachers reported in the use of student mentors for teachers' professional learning in ICT. In particular, it was designed to focus on the perceived effect of the approach on the teachers' skills and confidence with ICT and their classroom practice with ICT. It also exposed the teachers' recognition of other values inherent in the program.

To achieve this, a study of 22 teachers at two schools was undertaken. This chapter has a focus on the story of the child-to-adult mentoring program and how it progressed in the two schools involved. This is followed by a closer look at two specific teachers and their experiences through the project. First is the story of Odette, a Grade 3/4 teacher with some ICT experience, and second is the story of Moira, a Prep teacher with little ICT experience. Both teachers were naturally somewhat different in their personalities and their teaching and had some similar and some contrasting outcomes from this mentoring project. These will then be discussed with a focus on the specifics of the research question (see Figure 4.1).

What benefits of student mentors in ICT do teachers report?
In particular what is the perceived effect of this approach on the teachers' skills, confidence and classroom practice with ICT?

Figure 4.1. The research question.

4.1 THE STORY OF CHILD-TO-ADULT MENTORING

Any teacher involved in a program of professional development will bring to it their personal experiences and perceptions.

4.1.1   The two schools

Teachers in the project came from two schools, Mountaintop and Hillside. Although the schools were geographically close in the eastern suburbs of Melbourne, and had many similarities including clientele, there were also many differences in the schools. Size was a difference with Mountaintop having eleven classrooms and Hillside having six classrooms. At Mountaintop nine of the twelve participating teachers were primarily classroom teachers. At Hillside six of the ten teachers were primarily classroom teachers. Both school principals participated along with their literacy coordinators, an integration aide, a library technician and a physical education teacher/first assistant.

A major difference between the schools was in the teaching experience of teachers, particularly the classroom teachers. Figure 4.2 shows the breakdown of teachers' years of experience, with Figure 4.3 showing the teaching experience of classroom teachers only. The 15 year divider was chosen, as those teachers who were in teacher training greater than 15 years ago reported in their surveys almost no ICT training in their courses, whereas all of those who were trained in the 15 years prior to the project reported ICT training as part of their pre-service course.
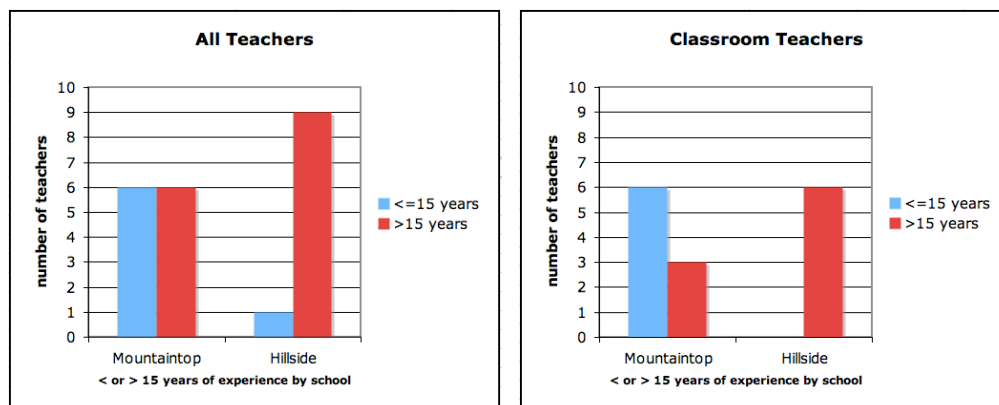
Figure 4.2. Years of experience: All teachers.

Interestingly Mountaintop had an equal balance of teachers with greater and less than 15 years of experience, but Hillside was heavily weighted to very experienced teachers. Hillside had a teaching experience range from 3 to 30 years, but all six classroom teachers had between 20 and 25 years of experience. Mountaintop had all teachers in the range of 4 to 32 years of experience with six of the nine classroom teachers falling in the range of 4 to 15 years of experience (see Figure 4.3).
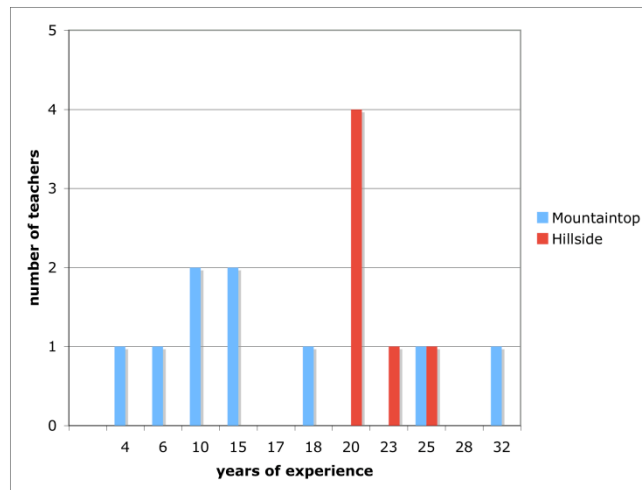
Figure 4.3. Years of experience: Classroom teachers.

Anxiety with the use of ICT was prominent in the literature and it was also evident in this project. Although the overall response in the pre-project survey to the question: *When Information and Communication Technologies (ICT) are mentioned how do you feel*? was positive, it is interesting to look at these responses by school and in relation to years of teaching experience.

Classroom teachers responded in very different ways between schools: at Mountaintop, almost all teachers commented in a positive way (see Figure 4.4). The most common response was excited (*n*=3) with the least positive response being "Glad to have an info tech person in the school." Hillside on the other hand had no most frequent response, but their responses were overwhelmingly more anxious.

	Positive responses	Possibly anxious responses
Mountaintop	• Excited (3 responses) • Fairly confident, willing to have a go • Interested • Alert	• Glad to have an info tech person in the school
Hillside	• Fine/confident	• Interested, a bit nervous about keeping up • Hope I am up to it! • Perplexed • Nervous • Non-enthusiastic

Figure 4.4. Responses to "When ICT are mentioned how do you feel?"

There was no apparent relationship between the teachers' years of experience and whether their responses were positive or negative. However, all negative responses

came from classroom teachers with greater than 20 years of experience and only two of the over 20 years of teaching experience were positive in their responses, which may indicate some degree of a relationship between anxiety and experience.

4.1.2   Teachers' enthusiasm for the project

Both schools had male principals who were enthusiastic about the integration of technology throughout their schools. Both schools had adequate technology facilities, but teachers noted they were always dealing with unwanted minor issues with hardware. For the Hillside teachers the project was seen as part of compulsory professional development and so all classroom teachers were involved. At Mountaintop all teachers were encouraged to participate in the child-to-adult mentoring program and approximately three quarters of classroom teachers chose to participate. The coordinator felt there were some extrinsic influences as she wrote in her journal, "Some teachers were keen to be part of the program and I am sure others felt 'peer group' pressure to be involved" (Mountaintop coordinator, journal, nd).

Teachers in both schools were generally enthusiastic about the program, although some had doubts about its value for them and their students. In the climate of ever increasing pressures and demands on teachers' time, many commented on the hope it would not be a waste of their time, as Lesley stated in her interview: "I am not one that would have a go myself generally if I think it is going to waste time" (Lesley, Hillside, interview, 16/10/2006). They were aware of the children's time, as Roxanne commented: "I don't want them to have wasted their time" (Roxanne, interview, 23/10/2006). Whilst concerned about time, they commented that it would be great if they did benefit from the program. As with Odette and Moira, the case studies presented later in this chapter, many teachers were interested in assisting the children by whom they were being mentored. As Roxanne described:

> I think now because they have shown me I feel … not obligated, like I feel as though I should, I have to now use the camera and practise the skills that they taught me. I don't want them to have wasted their time. (interview, 23/10/2006)

4.1.3   The mentoring sessions

Child-to-adult mentoring sessions were conducted in basically the same way at both schools. Mentoring sessions occurred at a time that was suitable for both students and teachers. The teacher, their mentors and the researcher sat together in a room with a computer and chairs. The layout of the room depended on the positions the children took. Examples of the various layouts are shown in Figure 4.5.

Both schools had chosen to work with digital cameras that were bought at the commencement of the project. Each teacher was expected to participate in three sessions with their mentors, but due to timetabling, teacher leave and other issues, some teachers had sessions that varied from the norm. One example of this was a teacher who was due to go on leave during the project so had two sessions, with the second being a longer session, incorporating what would be the second and third sessions for others. All teachers were given the opportunity to interact with their child mentors outside of sessions and, although many took this opportunity, some teachers just chatted to the mentors whilst on yard duty rather than seeking out their mentors' assistance between sessions. This informal communication assisted in strengthening relationships within the mentoring groups.

Figure 4.5. Various room layouts as preferred by mentors and mentees.

Each session included a hands-on experience for the teachers. They handled either the camera or computer throughout the majority of the session, or the children demonstrated with the hardware and then passed it to the teachers for their turn. Many teachers took notes through the sessions in the journal provided and all teachers took the opportunity to ask questions of their mentors as the sessions progressed. Once the sessions were finished the teachers were encouraged to call on their mentors whenever they felt the need. Some teachers did this regularly and continued to do so more than a year after the completion of the project.

To give a richer view of the data, attention has been focused on two teachers and their journey through the project based on the features inherent in a mentoring situation. Both teachers taught at Mountaintop, one in the middle school and one in the infant school. The first story presented here is that of Odette. Her story illustrates the continuing impact that child mentors can have on a teacher.

4.2 ODETTE'S STORY

Odette was a Grade 3/4 teacher at Mountaintop Primary School, an eastern suburban school. The year 2006 was her sixth year of teaching, but her first at this school. Although she was new to the school, she knew the children in the mentoring class of students, as they were also a Grade 3/4 class and the two grades often worked together. Odette's specific mentors, Angela, Violet and Wayne, were not very well known to her as she stated in her journal after the first session, "I have not worked a great deal with either of the children" (07/07/06). The mentors' class teacher had a great working relationship with Odette, frequently team teaching with her in their adjoining classrooms. She commented prior to the commencement of the project, that Odette would be one teacher who would really enjoy the project and benefit from it (personal communication, 03/07/06). Odette had previously been a mentor to beginning teachers at another school, but being new to this school in 2006 she had no specific responsibilities other than her classroom teaching. Odette felt she had a good level of computer education during her teacher training and had participated in the general professional development offered to staff, (e.g. *myclasses,*

elearning). She was keen to have further professional development in software programs such as *Windows MovieMaker*.

Prior to beginning the mentoring project, Odette saw herself as a capable learner, who was actively involved in her professional learning. She preferred to take notes so that she could refer to them in practice sessions. She preferred such sessions to be held very soon after the initial learning to maximise revision and consolidation of learning. She summarised her learning as "see it, do it, write it down, so I remember, and then revisit quickly because I forget. So I have to make sure I write it down and then refer back to it soon, otherwise I'll just file it away and not think about it again" (interview, 25/08/06).

Outwardly, Odette appeared confident with technology and had been using computers in the classroom during each year of her teaching. She wrote in the survey that she was excited when ICT or computers were mentioned and that "there's a whole lot of great stuff out there", but she was also finding it frustrating to use ICT with limited equipment in the school. On the zero to ten rating scale, she rated herself a five in confidence with the computer. Her corresponding comment read: "I don't have enough confidence when something doesn't work – and knowledge of computer systems, etc" (survey, 03/07/06).

When asked about this comment, Odette said her confidence was "so, so" and continued: "I have to have a play on my own and really make mistakes before I understand something properly, so I have to make sure I have learned it before I take it into the classroom" (interview, 25/08/06). Obviously Odette felt the need to know the content fully before taking it into the classroom to teach to her students. It is a matter of conjecture if this is how teachers, and especially Odette, will continue to think in the '*teach them how to learn*' not '*fill them with information*' era of education (Shuard, 1986). According to Julie Evans, the CEO of NetDay Project Tomorrow, the way that students think is changing: "Students no longer believe that the teacher is the font of all knowledge and students are the vessels to be filled" (Edmonson, 2006, p. 1). Is this change in students' thinking filtering into how teachers are teaching? This is certainly a challenge for teachers in this world of frequent technological change.

4.2.1 Odette's enthusiasm for the project

Odette approached the project with enthusiasm: "I was excited and keen to learn," and she even offered some of her students as 'guinea pigs' on whom the mentors could practise. Her child mentors got the impression she was there to learn as Angela stated in the first post session interview, "It looked like she was like wanting to learn something because, I don't know, the way she looked at us" (interview, 25/08/06). Violet continued, "she had a big smile on her" (interview, 25/08/06).

It is interesting to note that Odette used the mentoring example to describe her own classroom relationship with her students. When asked in the interview about her relationship with the students, she noted that it was:

> Quite similar to the mentoring. We take turns to mentor each other. Being new to the school this year, I always find myself asking the kids to help me out, and so with the computers, with the server, like knowing where to find certain things … So it is a little bit of I help them, they help me, then if we get stuck on anything we help each other. (25/08/06)

4.2.2 The mentoring sessions

Owing to student absences, Odette had three mentors over the course of the mentoring sessions, Violet (session 1, 2 & 3), Wayne (session 1) and Angela (session 2 & 3). The children all enjoyed working with her, both in and between sessions. Wayne was very enthusiastic about the mentoring and whenever someone was absent on a mentoring day he would offer to sit in for them. Consequently Wayne was involved in the mentoring of three teachers. His comments on the teachers were therefore insightful. He was really happy with the teachers he mentored and particularly Odette as this comment shows: "I got the thumbs up teachers… She [Odette] was actually more helpful [than other teachers mentored]. She didn't ask so many questions" (Wayne, interview, 31/08/06). Although Odette felt she asked too many questions, Wayne's impression, with his experience of others, was different.

4.2.2.1 Session one

In the first session, in her own words, Odette was "quite excited and very keen to learn" (journal, 07/07/06). She was hoping to gain insight into the school cameras, but also to be able to apply that to her personal camera. The children took her through the basics of using the camera. These included:

- safety instructions;
- turning on the camera;
- setting the mode;
- checking the image resolution;
- using zoom options;
- taking the photo - including partial hold to focus; and
- downloading the photos to the computer.
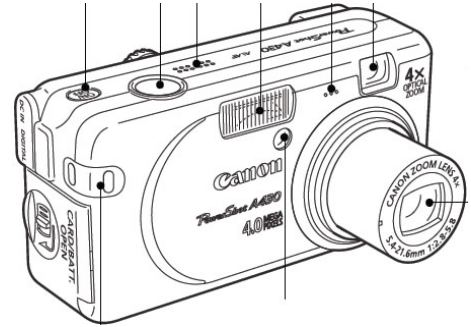
The learning environment was very positive and after initial nervousness, it became a constructive setting for learning. There was quite a lot of giggling and laughing. Initially I felt Odette seemed to be nervous, but it wasn't long before the laughter was all about enjoyment. "I need to write this down. (Laugh.) I am very sorry; I need to write all this down. So show me again. Show me" (Odette, session 1, 07/07/06). Odette constantly praised the children. "Fantastic. You are very good at explaining … Thank you, what great teachers you are" (session 1, 07/07/06).

She was very pleased with the children who mentored her. After the first session, she commented in her journal:

> The children who mentored me today were brilliant! I have not worked a great deal with either of the children. Wayne especially impressed me because he was very articulate and confident. His explanations were very clear and when I asked questions he clarified instructions for me. Violet was a little less vocal – but she offered suggestions when something didn't work and answered some of my questions. I felt very comfortable with the children when I asked questions, that I thought were a little basic and I should know the answers. The children answered them and repeated information for me. They seemed very proud of themselves for having such important knowledge to share. (07/07/06)

4.2.2.2 Session two

In session two the children revised the content of session one and then showed Odette how to insert and edit the photos she had taken in the previous session into a Microsoft Word document. This included:

- inserting the picture files into a Word document;
- finding and viewing the Picture Toolbar;
- text wrapping, cropping and rotating images;
- editing line style and fill colour;
- adjusting contrast and brightness; and
- setting transparency.
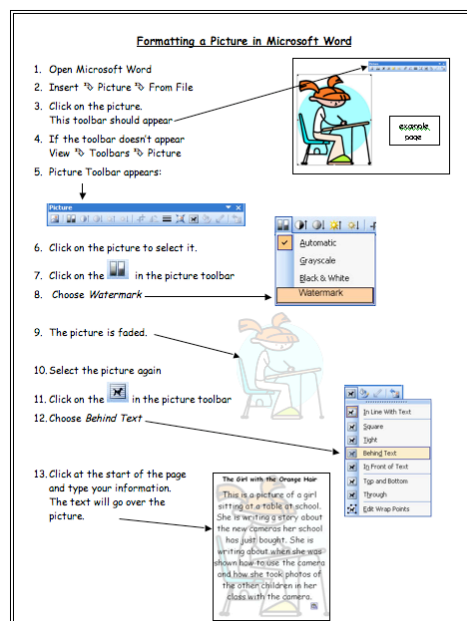
Angela was available for session two, so Wayne did not mentor. Knowing the content of the first session, but not having attended, Angela was amazed at how much the teacher had actually remembered. She commented in her journal: "The thing that I thought was really good was how she [teacher] could remember half the things when Violet and Wayne did it" (9/06/06). Odette had talked in the first session about practising both at home and in the classroom with her students. She had been excited to say that she couldn't wait to get home and try the techniques with her own camera. In session two, she proudly told the children how she had progressed at home with her own camera, which was the same brand so very similar and great practice.

Odette was really looking forward to the second session as she was feeling confident using the camera and wanted to focus on how to use and edit the photos in Word (journal, 21/07/06). She learned a range of editing options in Word, but was most impressed with the cropping feature: "Something I was shown today that I was unaware of was the cropping feature. I have used some of the other editing tools/functions, e.g. watermarking but not yet the cropping function. I think it will be very beneficial in the future" (journal, 21/07/06). She also learned more about the children in the session, as there was quite a change in dynamics with the new partnership. Violet, who had played an assistant role in the first session, was now the leader of the session as Odette mentioned in this journal comment:

My mentors were a different combination of children to last week and I was surprised by Violet! Last week she did not give as much input as Wayne, however with a new partner, Violet "took over" at times. She was very confident and took control of the session. (21/07/06)

4.2.2.3 Session three

Session three was quite short due to a time clash, but it confirmed Odette's increased confidence in both herself and the children. The children showed Odette how to use Microsoft Paint to further edit the photos she had taken. This included:

- inserting the photos into Paint;
- using lasso tool to cut out sections of the photo; and
- colour, text and drawing options.
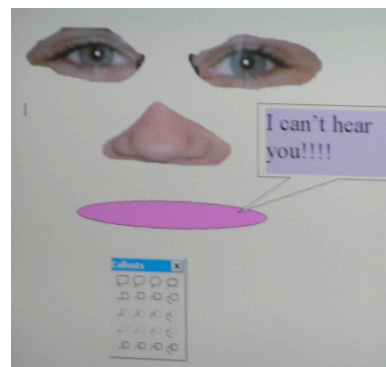
After the session Odette wrote in her journal that she was "feeling confident in taking photos and downloading them… also confident in downloading pictures into Word and Microsoft Publisher documents." She also noted that she would continue to utilise the children out of the required session times: "Due to the time limitations today we only touched on editing the photos in Paint. I am planning to meet with the children next week and continue the learning" (28/07/06).

Throughout all sessions, Odette took notes. Each time the children demonstrated techniques she wrote in her notebook. She then attempted the tasks and referred to her notes or corrected the notes as needed with oral assistance and encouragement from the children. Interestingly, in the third session the girls actually took notes also! As well as note taking, Odette used various other techniques to assist her learning. These included:

- asking the children to repeat things they had shown or told her so she could write them down;
- asking the children to slow down their instructions so she could take notes;
- questioning for clarity;
- repeating instructions as she enacted them or wrote them down;
- practising skills learned at home and in the classroom;
- sharing her skills with the students in her class;

- applying what was learned in her classroom; and
- calling on her mentors to assist her and her students outside of scheduled mentoring sessions.

All of these techniques were valuable to her and she was consistent in her use of them. Clearly she was aiming to gain as much as she could from the mentoring sessions.

4.2.2.4 Out of sessions

The mentors were very at ease with Odette and even corrected her if they saw her using the camera incorrectly out of session time. One such time was when the children were passing her room and saw she didn't have the camera strap on her arm. Violet went into the class and reminded her. "I'm your mentor and you have to put the strap on your arm." When asked if she was concerned about correcting the teacher, Violet was more concerned about the camera and replied, "If I don't tell her she might drop it and it could be broken" (interview, 25/07/06).

Odette was very keen to practise the skills and techniques she had been taught, so immediately began using the camera in her class. As this statement in her journal shows, she could see the benefits of using the cameras and the mentors, but also how using the mentors out of the structured sessions could assist her own learning:

> I used camera today to take photos of my class. After taking the photos I inserted them into a Word doc. I'm aiming to show my class how to do this over the coming week. Will possibly ask Elizabeth if her children can 'mentor' my class also in the use of digital camera. If they do I am hoping that I will hear all the directions again, therefore it will help my learning also. (25/07/06)

4.2.3   The mentors' views of Odette's learning

The mentors too were impressed with Odette and felt she learned a lot in the sessions. They were also aware that she had come to them with some skills of her own. Angela commented, "I think she did know a little bit about it". In the discussion that followed they decided the biggest things she had learned about were
•resolution;
•how to download pictures from the camera to the computer; and

•how to edit the picture on the computer (Angela & Violet, personal communication, 25/08/06).

4.2.4 Using what was learned in the classroom

Odette was very keen to pass on what she had learned to her class. She decided to ask her mentors for support. Consequently they were a part of planning and presenting lessons to the group of Grade 3/4 students. The following is her description of the mentors' involvement in the lesson:

> Violet and Wayne gave us a detailed set of [oral] instructions in the basic use of the camera. I was able to prompt them for more information when I thought my class needed it, which was great. After the whole class, we broke into three smaller groups. I had one group, Wayne had a group and Violet and Kim (integration aide) had a group. Each group had a camera and had the chance to take some photos. Next session I am planning to hand out the directions for using the digital cameras (maybe whole class reading focus). (journal, nd)

After the first session, Odette continued the use of cameras in her class as part of their inquiry learning and shared reading. She felt more confident, but still occasionally called on her mentors to "double check my explanations." When referring in her journal to the shared reading, Odette stated: "I think it would have been great if the children had a copy of the instructions as well as the camera so that they could read and then do." This seemed to mirror the way she preferred to learn as she took copious notes and referred to them continuously. She decided to create a guided reading activity for her students to complete in small groups "so cameras could be accessed by all children as they read" (journal, 24/8/06).

Odette gained in confidence as she applied her skills and commented in her journal: "We have been using MovieMaker in class for the past two weeks. Children are 'getting the hang' of using the digital camera and downloading pictures" (1/9/06). Though her confidence was increasing, she still utilised the support of her mentors as her journal entry shows:

> Several times I have asked children from Elizabeth's class to come in and help by supporting me when I am explaining something (eg how to save photos into the appropriate folder when downloading). They have been very helpful (and eager!!) to share what they know with us. (1/9/06)

In the same journal entry, she summed up her confidence in relation to her own skills. She stated: "I'm feeling much more confident in my own skills, therefore more confident when teaching these ICT skills" (Odette, 1/9/06).

4.2.5   Linking home and school experiences

From the first session Odette referred to the use of her home camera and how she was practising her skills with it. "What I am most excited about is that [resolution] function. I am going to go home to check my camera to see if I can make my pictures smaller" (session 1, 07/07/06). The children also reported that she was going to "try that at home with my [her] digital camera" (Violet, interview, 25/08/06).

4.2.6   Odette's perceived benefits of mentoring

The child mentoring sessions had quite an effect on Odette. A further development of her teaching was observed in the use of the mentors as support and co-teachers in her classroom. Elizabeth, the mentors' classroom teacher, confirmed that Odette was "more than happy to ask her mentors to help her" (interview, 25/08/06). There was also an increase in her confidence, which was observed on more than one occasion. Odette too noticed the effect and spoke about it in the interview and in her journal.

4.2.6.1 Personally – knowledge, skills, confidence and learning styles

"WOW- I always wanted to know how to do that" (Odette, session 3, 28/07/06)

Before beginning the mentoring sessions, Odette rated both her confidence and willingness to have-a-go with computers as five out of ten on a zero to ten rating scale. Both ratings moved to seven after the sessions. This increased confidence and willingness to try things with technology was obvious in her enthusiasm to continue to use the cameras and related programs in the classroom. Within one term she had introduced the students in her class to the cameras and they had used them regularly in their learning. They had specifically used technology further in their literacy activities, created art works for the school art show (see Figure 4.6), and movies within MovieMaker using photos and video they had taken with the cameras, downloaded and edited.
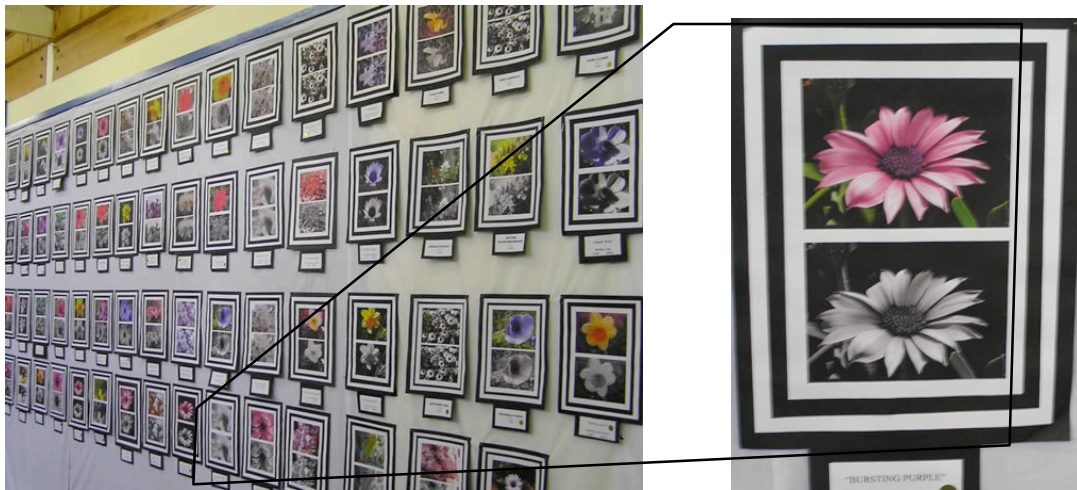
Figure 4.6. Children's photographic work in the school art show.

Odette stated that she was feeling much more confident when teaching ICT skills. As stated earlier, she put this down to greater confidence in her own skills: "I'm feeling much more confident in my own skills, therefore more confident when teaching these ICT skills" (journal, 1/9/06). This too was obvious in her survey where the rating out of 10 for level of ability with digital cameras had moved from five before the project to eight after the sessions, a figure she maintained when asked one year later. Further to this, her ratings for *overall skill with computers'* and *'MS Word'* and *'MS PowerPoint'* also moved up one point in the scale.

Feeling more confident led to other realisations. Odette felt anxious when watching children in her class slowly attempt to solve a problem. She admitted that her normal reaction would be to grab the mouse and solve the problem herself, but she had realised from the mentoring that doing that would not assist the children's learning because it had not assisted hers. She had wanted to be fully involved in the action of her learning. She spoke in her interview of one recent incident when she "stood back and said 'try this' and 'try this'". This signified for her the realisation that as adults we often take over whereas her mentors had allowed her to learn through doing. She commented on this further in her interview:

> If I just had've looked at it and watched them doing it, I would have just said "okay, maybe" and I wouldn't have used it I don't think. But because they said "now you do this" and "you do that" and I was actually doing it then more. It was actually good for me. (25/08/07)

Regarding specific skills, she commented on her camera and computer skills, but also on teaching methods:

> I have gained – with the computers – I just love the cropping, like being able to crop photos, so those sort of skills that I would rely on Elizabeth [co-teacher] to do for me. Like we did an art activity at the start of the year and we had to cut out the kid's heads in photos and Elizabeth did all of the 3\4s, so those sort of things I can now do independently which is terrific. Camera wise, just knowing a little bit more about the camera and I am hoping that in the future we will keep up the relationship and as Elizabeth's class learns, they can help me and then I can help my kids in turn. So that's probably yeah, personal ones, the way of teaching and so on. (interview, 25/08/07)

Her comment on the 'way of teaching' was interesting and she expanded on this later. The methods she had been through with the mentors had reinforced for her the value of note taking, and using new skills very soon after the initial learning, but also the value of the mentoring and the fact that the mentors were available to her almost any time. As she described in her interview, this gave her added confidence to try things with technology:

> It has probably reinforced in that I took lots of notes and then what I was doing in the class needed the skills that I learned through the mentoring, so I used them straight away and then if I had any issues I would just call on the kids from next door and they would come in and remind me. (25/08/07)

4.2.6.2 Professionally – her classroom practice

"It is something you can enjoy together." (Odette, interview, 25/08/07)

Odette's classroom practice was affected by the mentoring project specifically in that her confidence enabled her to utilise her skills, from those she already had to those she learned from her student mentors. She also regularly invited the mentors into her classroom to assist in her teaching. Odette utilised the child mentors in whole class explanations and also in small group work where they led the groups of students in their explorations. Her aim was to develop her own expert group of students in her own class as she explained in her interview: "With the cameras, we are in the early stages of getting Elizabeth's children to help my children and then sort of getting an expert group… I am trying to work on having an expert group in my class" (Odette, interview, 25/08/07).

The use of the child mentors in the classroom was very successful. Odette also noticed that the technology was very popular with her class when she commented,

"the technology – they just love it, they just beg to use the cameras". She also noted that the child mentors were "really good at explaining what they had to do and making sure, correcting the kids if they were making mistakes, or if they had questions – great answering of questions." The overflow into the rest of her teaching was discussed in the interview. Odette commented that she was much more aware of the strategies behind the mentoring. She commented in the interview:

> I have heard you mention that you have spoken to the kids about getting the person who, the mentoree to hold the camera and you explained and I am more conscious of that because you have a tendency to take over and that sort of thing. So I guess I am more conscious and trying to make sure I don't take over or if like we are doing partner work in another skill, getting the person who is explaining not to touch the mouse … I'm trying. (25/08/07)

When planning for classroom learning, Odette said the mentoring project had made her think about her optimum learning conditions, including the environment in which she learned and her preferred learning style. She therefore related this to her students' learning and offered different options to her class. An example of this was her comment in the interview when she compared her use of notes to the students' learning: "I thought I would need to see it written as well, so I got the instructions for the kids" (25/08/07).

4.2.6.3 Benefits of the mentoring over other professional development experiences

When asked to compare the professional development gained from the mentoring program to 'traditional' professional development in which she had participated, Odette was very complimentary to the mentoring. There were two main foci for her comments; the thoroughness of the children's teaching style and her need for individualised attention.

Odette felt that the mentors "picked up on the little things" that she wouldn't have bothered with, but that made her learning more comprehensive. Things "like making sure the picture size is the small one that holds less memory". That was important to maximise the efficiency of the camera and the ability to use the photos without further editing. She felt that the fact that they were more thorough has increased the amount she actually uses the cameras and photos in her classroom, as she clarifies in the

interview: "They were really thorough in that they showed me all the bits … they showed me other things so now I am using those other things like cropping, and I am using it a lot more in the classroom" (interview, 25/08/06).

She also noted that being able to have the students to herself made the sessions much more valuable for her. As in traditional professional development generally "you're one of many in a group" (Odette, interview, 25/08/06). Odette felt she was able to utilise the expertise of the mentors much more effectively than if she had been in a group of teachers with one adult mentor. With the child mentors Odette could "ask them questions on the spot and … they could tailor it for me". At traditional professional development, "normally, someone stands up and talks and you take it in that way" (interview, 25/08/06). This was seen as much less effective as there was very little possibility for follow up, and new skills and knowledge often got lost in her busy teacher's life. The availability of the child mentors within the school therefore was a bonus as Odette confirmed; "if there was something I wanted to do, they could follow up" (interview, 25/08/06).

The hands on aspect of the program, which seemed to be mostly lacking at traditional professional development that Odette had attended, was also a benefit. She stated: "I have to do it and occasionally we do small group stuff [at traditional professional development]. This was really beneficial because it was just me and I could do things". The ability to make mistakes and learn from them immediately also effected Odette's perception of the sessions. She was very clear to say, "I could make mistakes there and then, and we could fix it together" (interview, 25/08/06). Clearly Odette is a fan of the mentoring program and it is pleasing to see that she continues to develop as a teacher using ICT in her classroom.

4.2.7 Concluding Odette's story

Odette's experiences are a powerful illustration of how the role of student mentors for teachers can contribute to the professional learning of teachers, and also provide opportunities for reflection on their teaching in other contexts. The major personal benefit Odette reported from the program was the gain in "confidence and enjoyment in using equipment/computers" (survey_2, 29/08/07).

In a 'one year on' survey, Odette explained how she was "using the computers and especially the cameras a lot more this year [2007]" She attributed this to "greater knowledge of the equipment and software and support from other teachers and students [so that] problems and questions are solved quickly" (survey_2, 29/08/07). She also noted that she still saw her mentors often, but she had taken her learning further on her own and "moved beyond the learning done last year".

Directly related to her own learning experience through the mentoring project, Odette's teaching of ICT now involves less intervention in students' work, and more support and encouragement. She is now more aware of the need to allow the children to explore options and that her role is to offer direction as needed rather than to take over and do it for them.

As a great sign of her confidence in the mentoring program, Odette had even adapted the mentoring as practice for learning with ICT. The children in her class are now "teaching adults and classroom helpers how to use digital cameras" (survey_2, 29/08/07).

This second story presented here is that of Moira. Her story illustrates the ongoing support that child mentors can give to a teacher.

4.3   MOIRA'S STORY

Moira was a Prep Grade teacher two days per week and a specialist teacher two days per week at the same eastern suburban primary school, Mountaintop. 2006 was her 32nd year of teaching, and her 11th at this school. She knew the children in the mentoring class of students well as she had taught two of the three when they were in Prep and had taught all three boys in her specialist subject since they had been at the school.

Having previous knowledge and extended contact with her three mentors, Jeremy, Pearce and John, over many years, Moira was pleased when she realised they would be her mentors. She stated in her interview:

> I was fascinated with the three that I did get; I was really pleased because I'd had [two of] them in Prep. Just to see how much and how far they'd come and how confident they seem to have, you know, the confidence they'd gained to be able to help a teacher which I thought was wonderful for those three boys, especially Jeremy and John who are very, very quiet little children and of course Pearce came I think, in year 2, so I hadn't the same experience with him. (06/09/2006)

Moira had previously been a mentor to beginning teachers both in her classroom and specialist area. She had no computer education during her teacher training and since then had participated in the general professional development offered to staff (e.g. *myclasses, elearning*). Moira's family owned a digital camera but she preferred other family members to use it.

Prior to beginning the mentoring project, as far as technology goes, Moira saw herself as a very slow learner with a bit of a mental block and needing constant revision. In her survey she stated that she felt inadequate when thinking about ICT. As she explained in her interview:

> I'd have to practise each of the steps and have it written down so I could actually follow the steps and I guess like everything, the more you use whatever it is, the more confidence you get and of course it becomes second nature, but it just takes time. (06/09/2006)

Moira said she preferred to take notes, when learning something and to practise step by step what she had learned to gain confidence. She also saw herself as not wanting to be in the limelight. She explained this in the interview as: "I am not a very good chief, I'm a much better Indian. I would rather sort of stay in the background rather than the foreground, so yeah, you learn to manage that but it is still, you know, anxiety."

Outwardly Moira seemed anxious with technology, but was observed by the researcher, both before and during the sessions, as very keen to learn. In the pre-project survey, Moira rated herself as three on a zero to ten rating scale when asked about confidence with ICT, preferring to let others use the technology for her. She did

though rate herself as eight out of ten on the scale regarding her willingness to have-a-go. This have-a-go attitude was obvious in her demeanour during the project.

4.3.1   Moira's enthusiasm for the project

Moira exhibited enthusiasm for the project, but was seen by the researcher to be obviously anxious when arriving for the first session. When asked later in her interview how she felt going into the first session she replied:

> At first, a little, not insecure. It seemed very different, but then as we went on I thought "this is good for them and it is good for me, because I am learning at the same time they are sharing what they have learned", so it was a pretty good exchange of information time. (06/09/2006)

Her journal comments confirmed and elaborated this:

> I felt very unsure about the camera and the session hoping I wouldn't make a fool of myself in front of the boys. Jeremy explained the functions of the camera and to my surprise it wasn't as difficult as I thought. (14/07/2006)

Although still anxious Moira was very positive about being involved and wrote in her journal after the session: "I am feeling positive about being involved and am looking forward to feeling comfortable using the camera and computer for further use" (14/07/2006). The child mentors also felt that Moira was enjoying the sessions as Jeremy's journal comment shows. "Mrs. M dose rely in eoyd it wak were me, pete, jon" [Mrs M does really enjoy it, working with me, Pearce, John] (07/07/2006).

4.3.2   The mentoring sessions

Due to student numbers, Moira had three mentors, where most other teachers had only two. This made the mentoring room a little more crowded, but allowed for further versatility with the three mentors assisting each other. The children were all present at each session and Moira frequently called on one or all of them between sessions.

The boys did not comment much on Moira but Jeremy did note that the choice of teacher was playing on his mind when he said one of the reasons for his initial nervousness came before he knew which teacher he was mentoring. As he stated in his interview: "I was a bit nervous and a bit excited. Because when I was nervous I thought 'which teacher was I gunna [sic] have'" (31/08/2006).

Pearce was impressed with Moira's knowledge by the end of

Process for Taking a Photo Pentax Optio E10

1. **Turn on camera**
   a. Strap on
   b. Hands clear of lens
   c. Don't touch screen
   d. Button on top

2. **Set the mode**
   a. Dial on top
   b. What mode is it?
   c. Choose S for simple

3. **Check image resolution- recorded pixels**
   a. Press menu
   b. Recorded pixel should be 640
   c. If wrong - press OK
   d. Use 4 way controller to chose 640x480
   e. OK MENU

4. **Zoom**
   a. Moves you closer
   b. Digital zoom can blur
   c. Optical zoom is best

5. **Take the photo**
   a. Button on top
   b. Press half way down
   c. The [ ] middle of screen turns green - focus
   d. Press all the way down

6. **Download**
   a. Turn off the camera
   b. Plug small end of cord into camera and other end into the USB port on the computer.
   c. Turn the mode dial to the blue arrow.
   d. Turn on the camera and put it in a safe place.
   e. Computer recognizes the software
   f. New window comes up. Press next. Follow the instructions given.
   g. Select pictures by ticking the photo.
   h. Put a general name for these photos. Browse for the folder to save your pictures in.
   i. Follow the instructions to save. Wait as pictures download. Press finish to see photos.
   j. Turn off camera before taking cords out of camera and computer

the sessions when in his final journal entry he wrote: "WOW Mrs. M knows a lot!" (nd).

4.3.2.1 Session one

Commencing the first session, in her own words, Moira was "probably a little anxious". She explained that this was mostly due to her lack of knowledge in the ICT area, but also the possible embarrassment in front of the children. In the interview she explained: "I didn't know a lot about that area and I just thought I would make an idiot of myself in front of these three little kids". Although they were her feelings at the start of the session, this soon changed as she clarified:

> But it was only the initial thing before we got started, and once we got going it was pretty OK … I felt more comfortable in the setting and I don't know, maybe having a go, I think learning, being an ongoing learner is a very important thing. (interview, 06/09/2006)

Very quickly, Moira realised she was actually learning in the session and the children were not concerned whether she had prior knowledge or not. The children efficiently took her through the basics of using the camera. These included:

- safety instructions;

- turning on the camera;
- setting the mode;
- checking the image resolution;
- using zoom options;
- taking the photo - including partial hold to focus; and
- downloading the photos to the computer.

The learning environment was enthusiastic, with all participants looking happy in each other's company. The children all stated that they were excited to be teaching a teacher because it was normally the teacher teaching them. Two of them also commented in the interviews that they were also nervous at the beginning, one because they didn't know who the teacher was that they would be mentoring and the other because they didn't want to "stuff it". The following comments from their interviews show their feelings.

> I was a bit nervous … but then I started doing it I felt good because I got chosen to do it. [Why were you excited?] Because I got the chance to do it. To teach someone. (Jeremy, interview, 31/08/2006)

> [I was excited] because we were going to teach the teachers. [It is exciting] because they always teach us. … Then [I was] a bit **nervous** because I think we might stuff it and we would run out of time and we wouldn't be really good mentors. (Pearce, interview, 31/08/2006)

The three boys worked very well together with Jeremy taking the lead and the others following in their notes and assisting when necessary. Jeremy gave the teacher the camera and told her how to use the equipment. He got her to manipulate the camera as required whilst pointing to items discussed. It was noted that he left the camera in the hands of the teacher (researcher notes, Moira session1, 14/07/2006). As Pearce stated in his interview the mentors had actually discussed who would do what prior to the sessions. Specifically, "who was going to talk the most and who was going to help him out and we'd go over what we had to do so we'd remember it" (Pearce, interview, 31/08/2006). They were well organised and worked efficiently as a team.

Moira too worked efficiently to gain information on the sessions. As this researcher note explains: "The teacher frequently asked questions during the session when she required clarity, or had a query between instructions. She referred questions

generally to all three boys but occasionally asked a specific child a question" (Researcher notes, 14/07/06).

Once the first session was over Moira said she felt better about the project, but was overwhelmed by what she had learned. In the interview when asked about how she felt at the conclusion of the first sessions she stated:

> Better, still overwhelmed because there was a lot to take in and then I felt like I had to go home and practise. So I got out the camera at home and started doing things at home, trying to sort of practise up a little bit of what I had done, so it gave me incentive, I think, to actually go and practise before the next session. (06/09/2006)

Although Moira felt the need to practise at home to feel less overwhelmed in the next session, the boys were happy she had learned a great deal. Jeremy focused on her learning when he commented: "I think she learned to download a bit better" (interview, 31/08/2006). Pearce also noticed improvement and commented that "she learned how to work with digital cameras and what's the best camera" (interview, 31/08/2006), but he also commented on his pride in their efforts and felt that Moira had learned a great deal from them. He said he was "proud because we teached (sic) a teacher" (interview, 31/08/2006).

Moira too was happy with the sessions and talked enthusiastically of the improvement in confidence in all three boys. She compared the sessions to when she had been a mentor for a student teacher, and how it was so different because, "I felt like I had the experience and I had more to sort of offer them, whereas these little ones had the information and I was getting it from them, which is really quite a role reversal" (interview, 06/09/2006).

Moira felt her relationship with the boys had changed. She now felt "quite comfortable going up to either of the three of them, any of them, and saying 'Jeremy can you give me a hand with this' or 'Pearce can you show me' or 'John' you know" (Moira, interview, 06/09/2006). Moira even felt it had changed her relationship with the whole class of mentors as when she couldn't find her own mentors one day, she asked another mentor to assist her as described in her interview:

> The other day I couldn't find any of them and I found one of the others because … I knew that they all had done the program so I think Andrew was

in there so I grabbed him and he came in here and he was very efficient. So I think the whole thing has really benefited all of the children who have done it. (Moira, 06/09/2006)

Moira was very pleased with the progress of the children and felt they were so much more confident since the mentoring project. In the interview Moira was constantly commenting on the children's confidence. As this quote shows, she was really pleased that their confidence seemed to be likely to flow into other areas:

> They have got the confidence by doing this. I think they'll think they can do other things too. So I think it will give them ongoing confidence, especially, as I said, John and Jeremy who are really very quiet and, as I say, they'll then, I think, go into other areas they are learning and have a go too, because I am sure this was a learning curve for them too. So it should flow into their other curriculum areas too. So, I think all experiences will give them a bit of a boost, a bit of self-esteem and things like that. (Moira, interview, 06/09/2006)

4.3.2.2 Session two

After practising between sessions, Moira felt a little better, but "insecure because everything was different, was new" (interview, 06/09/2006). She commented that she would have liked more time to revise each aspect with her mentors. "It's a new learning sort of coming, building on, but it is still all new each week, so there's still that little bit of anxiety but nothing that was too bad" (interview, 06/09/2006).

In session two, the children revised the content of session one and then showed Moira how to insert and edit the photos she had taken in the previous session in a MS Word document. This included:

- inserting the picture files into a Word document;
- finding and viewing the Picture Toolbar;
- text wrapping, cropping and rotating images;
- editing line style and fill colour;
- adjusting contrast and brightness; and
- setting transparency.
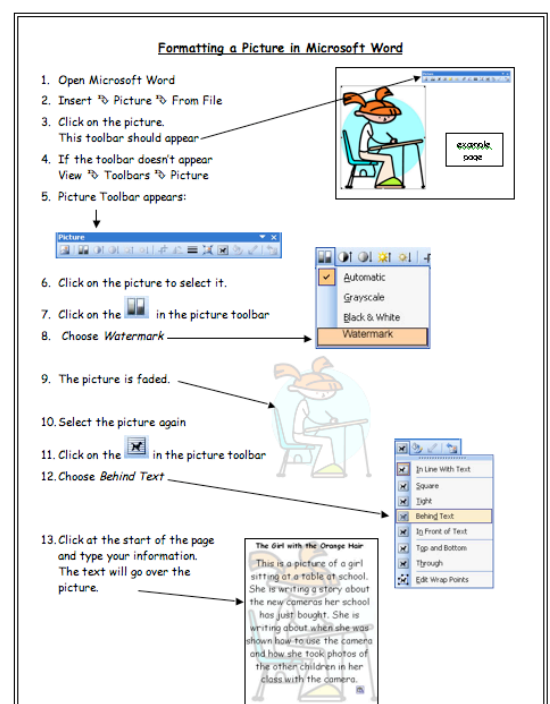
Once again the environment was very conducive to learning, with the boys cooperating well and really assisting Moira to learn. Although Jeremy again took the lead, Pearce and John were more forthcoming with information and suggestions. The boys regularly used their notes for support. So much that Moira, when asked about the mentors' teaching methods, in her interview, actually said that she would have liked a copy as shown in her response here:

> I thought it was methodical. I would like to have the sheet they were following so that I can follow it. But they were prepared and they knew where they were going and what they had to say and followed through their sheets so it was, as I said, all very methodical and it was a support for them too when they came to the sessions. So I thought they were well prepared and very confident and ready to go, they were eager to go. (06/09/2006)

Again Moira commented on the children and how she could see the development in their teaching methods from their own learning. She also noted the qualities that she felt made them "great mentors":

> Jeremy is very calm and methodical. Jeremy has learned survival strategies because of his learning difficulties. He has learned to follow instructions step-by-step. This way of doing things is an asset to Jeremy and this helps him be a great mentor. Pearce on the other hand was quick showing he was well informed and wanted to share his knowledge all at once. John was the quiet one. (journal, 21/07/2006)

Moira felt better using the camera coming into this session as she had practised during the week, at times with a mentor by her side. She wrote in her journal:

> This week I felt better about using the camera. My mentor Jeremy came to check my progress and make sure I was using the camera correctly. I used the camera for a woodworking incursion and I felt good being able to do this. Normally I would have another teacher or parent take the photos. Down loading the photos onto the computer and storing them in a file is OK. But I'm not yet confident with manipulating the photos. Today's session was full on and I felt that we progressed through too many steps too quickly. Jeremy and Pearce were very confident and fast at showing me all the aspects. (21/07/2006)

4.3.2.3 Session three

In session three, the children showed Moira how to use Paint to further edit the photos she had taken. This included:

- inserting the photos into Paint;
- using lasso tool to cut out sections of the photo; and
- colour, text and drawing options.

It was becoming apparent that although Moira was learning in each session, she was also becoming overwhelmed by the amount of information that was being presented. She commented in her journal: "Today's session was very 'full on'. There was a lot to take in as usual. I felt that today's session could of (sic) been split into two, with some practice of the skills during the week" (Moira, journal, 28/07/2006). With the amount of information in each session, revision was foremost in Moira's mind: "After this session I really feel that I would like to revisit these skills again as I'm not feeling very confident" (Moira, journal, 28/07/2006). Moira related her confidence to the confidence of John when she suggested in her journal that he might give her some revision: "Jeremy and Pearce were confident at each step, again John was the quiet one. It will be interesting to ask John on his own to take me through the steps of manipulating the photographs" (Moira, journal, 28/07/2006).

Overall Moira worked well in the sessions. Her journal comments show she was learning a lot, but at times felt the pace of new information was overwhelming. She certainly would have liked more time for revision between sessions. It was interesting to notice that Moira had no session notes or instructions written in her journal. Although she previously mentioned preferring to use notes to assist her learning, her learning strategy seemed to include listening intently, following instructions, repeating processes and asking questions. Moira commented previously on the amount of information she felt she was gaining in each session, sometimes too much, possibly Moira was just too busy to think of writing notes. The way Moira seemed to deal without notes was to access her mentors when she had an issue. The use of the mentors in the place of her notes was certainly a strategy Moira used often.

4.3.2.4 Out of sessions

Moira had regular contact with her mentors and often called them to assist with her use of the camera in the classroom. This included taking photos for her during some sessions and reminding her of how to use different facets of the camera and programs as she used them to assist her teaching at other times.

Jeremy and John were particularly pleased that Moira sought their support out of formal sessions. As Jeremy commented in the interview:

> I feel pretty good because she can just come up and say "can you help me with this?" I thought whatever teacher I got she wouldn't say come up and help me. [She has asked for help] probably about three times. [She said] "can you come and help me with taking photos and downloading them"? (31/08/2006)

Feeling the need to confirm who was doing the actual work, the researcher asked "does she get you to do it all?" to which Jeremy responded: "No. I basically tell her a bit and then she does it" (31/08/2006). John also commented on Moira and how she was using them as a backup if things went wrong:

> Sometimes she calls back for trouble she having in classroom … if she does something wrong she doesn't know how to fix it. So sometimes she comes. [What sort of things did she ask?] She asked us how you do it … cos she can't remember how to take a photo so that's what she asked me if she do something wrong. (John, interview, 31/08/2006)

Moira consistently utilised the boys as support. This was recognised by the schools mentoring coordinator. She commented in her interview:

> Jeremy, Moira had him as one of her mentors and she has known him right through and he has issues and she just said the way he spoke, his confidence, he looked you in the face and his ability to just go 'yes, yes, I know that' and he notices what she'd be doing and she has asked him four or five times now to come and help, download photos, she lost her photos … and he said 'it's okay we will download them again' and showed her where to download them to, where to put them and then she asked him to come in to take photos while they were having an in-school experience … so for them to just walk out and go no big deal. (Mountaintop coordinator, interview, 25/08/2006)

This was confirmed by Moira, in her interview:

> I think I got them out there one day when we had an incursion, a woodwork incursion, so I got them to sort of stand beside me and make sure I was doing all the right things. … It was good to have someone, as I say, just standing there as support and saying "well, what do I do now" and they would tell me and it was very good and they felt very important coming out to sort of help and they sort of take it in their stride and I think it is wonderful. (06/09/2006)

As already noted, this was also confirmed by Jeremy, one of Moira's mentors.

4.3.3 The mentors' views of Moira's learning

Jeremy, Pearce and John enjoyed their mentoring roles and had some great insights into Moira's progress through the sessions. Jeremy noticed the initial nervousness as he commented in his interview: "I think she was a bit nervous because she didn't really know what we were going to tell her". When asked if he thought she felt better after the first session he replied: "I think she felt really happy because she actually knew a bit more than she thought from day one" (31/08/2006). He went on to explain what he felt she had learned: "She feels quite confident to grab a camera and start taking photos and downloading them and all of that." He also felt she would ask him for assistance when she needed reminders "just to remind her and download and stuff" (Jeremy, interview, 31/08/2006). John also focused on the teacher's feelings and needs. He interpreted the nervousness seen by Jeremy as excitement when he stated: "I think she felt that she was excited because she gets to learn about the camera" (John, interview, 31/08/2006).

Pearce initially focused on Moira's questioning: "They ask you a lot of questions and it's pretty hard to answer them" (interview, 31/08/2006). He also commented on what she learned about the cameras, but went a little further to explain what she also learned about him: "She learned how to work with digital cameras and what's the best camera [and] that I'm smart" (interview, 31/08/2006).

4.3.4 Using what was learned in the classroom

Moira utilised the skills, knowledge and confidence she gained with the cameras and related software to integrate the photographs in her teaching as she explained in her interview:

> I can see the potential in how you sort of can be in the classroom if you know how to do it really quickly because if it takes you hours you tend to think "I haven't got the time" and you don't do it. But if you pick up the camera and have the photos within the system within the half day then it is instantaneous and you can use it with the children there and then rather than wait a week or two and with little ones it has to be instant, tomorrow's too late. So I think I have gained a lot. (06/09/2006)

Moira went on to discuss her confidence to use the camera in her classroom and how her fear was dissipating:

> I feel confident now to pick up a camera and take pictures and actually download them onto the computer. From thereon I would still have to do a lot of fiddling but at least that was the first step, I couldn't do that before. So, you know, I have learned something… I will have a go now, I won't be quite so scared of picking up the camera and heading around and taking photos. (interview, 06/09/2006)

Moira's regular support via her mentors made this use of technology easier and she felt very happy to have them supporting her both privately and within class activities.

4.3.5 Moira's perceived benefits of mentoring

Moira's skills with the digital camera and related software improved greatly throughout the project and along with this her confidence also showed an improvement. For Moira it was a matter of now using the ICT rather than asking someone to do it for her. This then flowed over to her classroom practice. She also saw a great benefit of the program in the progress of the child mentors, of whom she was very proud.

4.3.5.1 Personally – skills and confidence

In the pre-survey, Moira rated herself as a two out of a possible ten when asked about her level of ability with digital cameras. After the sessions, Moira rated herself as a six. She was "really pleased I actually took the leap and had a go and did it [the mentoring project] because I will have a go now. I won't be quite so scared of picking up the camera and heading around and taking photos" (interview, 06/09/2006).

For Moira the improvement in her level of ability with the digital camera seemed to lead to an improvement in her confidence with ICT generally, but according to her self assessment on the pre to post surveys she only increased from a three to a four. This was not commensurate with the four point increase in her level of ability with the digital camera, but it was interesting to see how much difference this small numeric change can make when you are feeling supported. Moira constantly referred to her child mentors when she was in need of support and this allowed her to complete activities that she would normally have left to others. As noted earlier "Normally I would have another teacher or parent take the photos" (journal, 06/09/2006).

4.3.5.2 Professionally – her classroom practice

Moira's use of the camera in her classroom focused generally on the taking of photos and using the photos later as a stimulus for discussion and/or writing. They were used in both generalist and specialist classrooms. The difference was that in specialist areas they were mainly displayed in a common area and discussed by children outside of class time, whereas in the Prep classroom they were used during the literacy time. The photos were printed out and used as an oral language stimulus to assist in recall of the experience. They were also used in small group discussion to promote writing. As Moira confirmed in her second interview: "Children stand around and chat about the photos. It's great for oral language" (20/02/2008).

Due to her involvement in the project it was now easier for Moira to take the photos herself rather than having to organise a parent or other teacher to help. She was also getting used to the management of the files on the school system, which made retrieval and use all the easier. As she stated in her interview: "Once I get the file management a little bit under control I will feel a lot happier" (06/09/2006).

Being in the Prep classroom, Moira also had a 'buddy' system running with the Grade 6 students. The cameras were used in the buddy sessions and photographs were presented to buddies at the end of the year as a memento of their friendship.

4.3.5.3 Benefits to the children

Although Moira gained personally and professionally in the project, for her the focus of the project was the child mentors. She had known her three mentors for many

years and was particularly interested in their development through the project. Moira was particularly aware of the boost she saw in the three boys' confidence. She was astounded at the improvements particularly in Jeremy who has great difficulties in his academic schooling. Her interview comment sums up her thoughts on the gains this program offered to her mentors:

> Well in Jeremy I just saw the confidence in a little boy who had started off with learning, a slow learner, because of other medical things and because he had been born very premature child. So his learning had to be very slow and very methodical, and to see him, you know, to become a mentor was just overwhelming really for me, it was just because I had seen him struggle so much as a prep, so it was overwhelming. The same with John. John came to us with no language and he couldn't actually verbalise a lot of things. He knew what things did but he couldn't name them and, as I said, it took us probably three quarters of the year to get John to actually start verbalising things. Now to see him turn up as a mentor it is obviously a very big step for that little boy. And with Pearce, I think Pearce has probably been a little more confident than the other two would have been as little ones, and also some of his schooling was overseas so that's different, he's had different input. But for these two little boys, to see where they started from and see where they have come to is just amazing. … with Jeremy it was just the confidence. The confidence to actually guide someone else. And John too. Because John didn't have a lot of input verbally during the sessions, he was watching, he was looking, but just to see the confidence in these little boys was just overwhelming really. (06/09/2006)

She also felt their confidence was useful to her learning because they did actually teach her:

> They actually taught me things as we went along and like I was saying, to see their confidence and to think that this is a two way exchange too, not just a one way and to see how far they have come … they were happy to do it, they were willing to do it, they did the training and were very happy to do all that, and they come with confidence, you know to help me and I don't think there's any drawbacks at all. (interview, 06/09/2006)

Disappointingly, when Moira was surveyed one year after the project she was not using ICT as much as she had been in 2006. She rated her confidence with computers as a four, the same as at the end of the sessions and stated that she is using computers less than in 2006. To gain further insight into this loss of use, a

second interview was organised. In this interview Moira clarified that as she was teaching two days in her specialist subject and the other two days split between two classes she did not feel she had the time to commit to the use of ICT. She did however comment that she recommended a language site to students in a newsletter each month and encouraged the use of PowerPoint for student presentations (interview2, 20/02/2008).

On the positive side Moira still calls on her mentors "when I need them to assist me if I have forgotten" and recalls the project as: "a great experience – positive for me and the mentors." She stated she "notices that the mentors continue to learn and expand their knowledge" (Moira, one year later survey, 01/09/2007).

4.3.5.4 Benefits of the mentoring over other professional development experiences

Moira felt very comfortable with the children in the mentoring sessions and thought perhaps this was because "it wasn't as threatening as my peers". It is interesting that many teachers in the project felt this way. Moira went on to say that she "would rather stay in the background than the foreground. I don't know, just a bit of insecurity I suppose". She also described in her interview why she felt the children's mentoring style was beneficial to her:

> Because I think as learners, I think they are prepared to go over and over things and they do it very differently to an adult who presumes you should know so much, where the children don't have the presumption. They know that they are there to help you, they don't really know how much you do or don't know, whereas other adults like at home, at my home with my IT husband, they assume you know so much and they take you through things so fast it's a blur, so that's where I felt the children just very, very different, they're more open, they're more, I don't know, there's just not that same threat. (06/09/2006)

4.3.6 Concluding Moira's story

For a teacher who came into this project saying her confidence with ICT and overall skills with ICT were a three out of ten, Moira had made some advances. Although she rated herself at the end of the project as only a four in both areas, she had

moved from a two out of ten in her reporting of her level of ability with digital cameras to a six. This jump of four points was considerable and above the mean of three points with only four teachers recording a greater improvement.

4.4   A COMPARISON: ODETTE AND MOIRA

Both Odette and Moira were teachers at the same school. They both gained from the mentoring project, but in very different ways. Overall Odette's story illustrates the continuing impact that child mentors can have on a teacher with Odette having "moved beyond the learning done last year" (Odette, survey2, 29/08/07) and including more varied ICT in a broader range of curriculum areas than she had been prior to the project. Moira's story, on the other hand, illustrates the ongoing support that child mentors can give to a teacher with Moira continuing to call on her mentors to reinforce the skills they taught her in the project. This need was mainly due to the irregularity of use, but also the ongoing confidence issues for someone who infrequently used technology. Further commonalities and contrasts will be discussed here with specific reference to the Research Question (see Figure 4.1) and its focus on the benefits reported by teacher participants.

4.4.1   Knowledge, skills and confidence with ICT

Before, during and after sessions, both Odette and Moira discussed the value of the sessions for the personal development of their own knowledge and skills in ICT. They were keen to learn new skills that could be utilised in their teaching. After the sessions, both teachers were pleased with the knowledge they had gained with the camera and the computer programs. The difference between the two was in respect to confidence. Whilst Odette went into the first session thinking about gaining insight into the school camera and applying it at home, Moira went into her first session feeling anxious due to her perceived lack of ICT knowledge. She felt she didn't want to be embarrassed in front of the boys as she explained in the interview: "I didn't know a lot about that area and I just thought I would make an idiot of myself in front of these three little kids" (06/09/2006).

In the pre- and post-project surveys the teachers were asked to rate their confidence with the computer and their level of ability with digital cameras. It is obvious from the data presented in Figure 4.7 that Odette started the project feeling more confident

with ICT than Moira and that her confidence continued to develop as the project progressed.
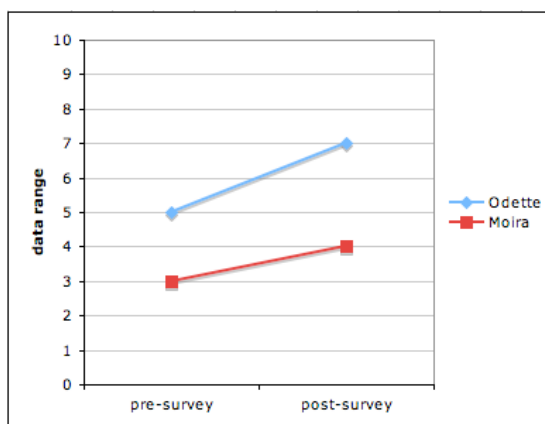
Figure 4.7. Odette and Moira's reported confidence comparison from surveys.

Odette also started ahead with her reported level of ability with digital cameras (see Figure 4.8). It is interesting to see that Moira rated herself in the post-project survey as a six, giving a stronger increase in her level of ability with the camera than Odette. Although Moira felt she had really improved in the ability with the camera, her confidence with ICT was only marginally increased.
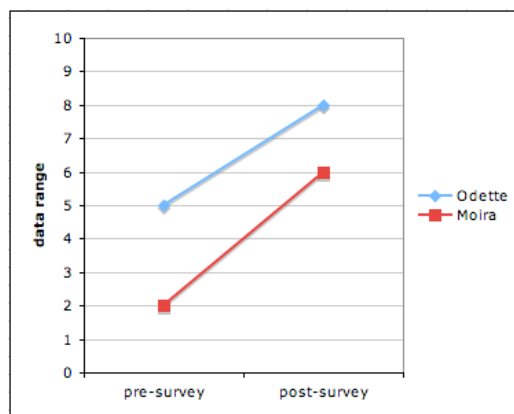
Figure 4.8. Odette and Moira's reported digital camera ability comparison from surveys.

Odette picked up the camera techniques very quickly and took copious notes to assist her to remember the techniques. She was particularly confident with the camera. Moira too picked up the camera techniques quickly, but unlike Odette she did not take any notes. By the completion of the session Odette was excited to try techniques on her own digital camera at home. Although Moira felt the session enabled a good exchange of information, she was feeling overwhelmed and wanted time to practise. Although Moira's anxiousness abated, and she began feeling better in respect to using the digital camera and related software because she had

practised with her mentor during the week, she was still feeling insecure as everything was new each session. After each session, Moira commented that she was still a bit anxious and feeling overwhelmed with the amount she was shown in each session and would like further revision time to boost her confidence.

The children noticed Moira's nervousness, but felt she was happy once they taught her each item. They understood she wanted their assistance outside of session times and were very obliging with their time. They said it was good to help her because she needed reminders. By the end of the sessions, the boys felt Moira was confident in taking and downloading photos. Odette also called on her mentors between sessions to assist her to teach her own class in the use of the cameras and software. This was valuable for her class but also as personal revision as she could revisit the information herself.

By the end of the sessions with the mentors, Moira had picked up the skills of using the camera and downloading the files to the computer. She was not yet confident with the manipulation of images. Conversely, Odette was feeling very confident to take photos, download and insert pictures into various computer programs. She commented that she loved cropping and was "feeling much more confident in my own skills, therefore more confident when teaching these ICT skills" (journal, 1/9/06). Her mentors were very impressed with her and felt she had learned a lot including setting resolution on the camera, downloading and editing photos. One year after the project, Odette noted that she still sees her mentors often, but she has taken her learning further on her own. The mentoring sessions stimulated her to learn more! Moira too continues to have contact with her mentors, and uses them to assist her when she needs reminders.

4.4.2   Classroom practice with ICT

Both Moira and Odette utilised the new skills and confidence they had acquired in the mentoring sessions in their classrooms, but in very different ways. Moira, teaching a Prep class saw less opportunity to use ICT in the classroom than did Odette teaching older children in a Grade 3/4. Moira used the school cameras for taking photographs of the children in the class during special events. These photographs were then used mostly in literacy time as stimulus for discussion and writing. One compounding factor for Moira was that she felt the photos needed to be used very close to the time

they were taken so as to gain the best response from the children. This made time frames short, which sometimes caused difficulties. During these photography times, Moira called on her mentors when necessary to remind her, or step her through a process.

Odette also asked her mentors to assist her if she forgot something, but she also used the newly acquired knowledge, skills and confidence she had gained in the sessions to impart the skills to her students. Her aim was to create an expert group of students in her class. She did this by utilising her mentors to team-teach with her. The child mentors came into some sessions and assisted Odette to pass on the knowledge and skills with the cameras and related software. This including showing the students as a whole class group the basics of the camera, then breaking into groups and each mentor and teacher leading a group. The class children then used the cameras across a rage of curriculum areas. These included literacy activities, movie making and as the focus of the grade's activity for the school art show. Odette also used these classroom sessions as revision for herself.

Another influence on Odette's classroom was in the realisation that it didn't help her to learn when others did the activity for her; she felt she needed to physically do everything herself to really learn it. Along with this came the realisation that it wouldn't help the children in her class to learn by her doing it for them. She made this comment after realising that she needed to actually be hands on with her learning and it helped her to remember it. This impacted on her classroom as she explained in the interview:

> I was just in the classroom then and we were inserting photos into a Word document and I was just standing there and I was resisting the urge to, because it wasn't working and I don't know why it wasn't working and it kept saying … I don't know I can't even remember the message. And the boy who was using the mouse, I was dying to go "well here try this" because I knew I could do it quicker and we had limited time, but I didn't, I stood back and said "try this" and "try this" and we ended up putting it into Paint which I have learned from the mentoring. (25/08/2006)

4.4.3 Recognition of the value of mentoring

As previously discussed, both Odette and Moira realised the value of the mentoring, as shown by their use of mentors outside the class to assist in their revision. They both used the mentors by asking them to assist when a problem arose as well as asking them to come and be a support for some class activities including the use of the cameras or related photographs. Complementary to this, Odette utilised the mentors in her class to teach her students; this worked well as a team teaching situation where Odette controlled the focus of the lesson and the mentors assisted with instructions on use and each led a group of students. Odette had adapted the mentoring model to create a panel of experts in her classroom to encourage capable students to mentor others. Odette also used these sessions as revision for her own learning as the children in her class asked many questions that were suitable to extend everyone's learning. Both teachers continue to have contact with their mentors in informal ways and still call on them for advice if necessary.

4.4.4 Knowledge of students, their capabilities and potential

Neither teacher had thought specifically about the capabilities or potential of the children to complete the mentoring task prior to the sessions and they were both surprised at what they experienced. As Odette stated, the children were brilliant. Odette was impressed by their confidence and abilities. She found them to be articulate, particularly when explaining items and answering questions. As the sessions progressed she felt even more confident with their knowledge and skills. She also commented: "They seemed very proud of themselves for having such important knowledge to share" (journal, 14/07/2006).

Moira too was very impressed with the confidence of the children, particularly the growth in their confidence, since she had taught two of them in their first year at school. She was comfortable to ask them for help between sessions because they were capable and came willingly. This made her happy to call them when needed because she knew they could really assist her. Moira interestingly also noted that each of the three boys were very different in their approach and that at different times different personalities were more conducive to her learning. One child was very quiet and did not have much input, but when he did speak up Moira knew to listen. A second boy was very calm and methodical which she enjoyed as she learned processes, another was very well informed, but sometimes moved too quickly for

Moira to keep up. Overall for Moira it was the confidence of the children to be able to teach an adult that astounded her most. She had taught all three boys and was truly elated to see the confidence they had gained in the project, and reports that they have continued in this way and still appear very confidently whenever she asks them to assist her.

Both teachers were pleased that their child mentors were very available and willing to assist at any time. They were really pleased with this aspect of the children's attitude, as they sometimes wanted to call them when the children were at play or sport and they always came very willingly.

This chapter told the story of the *Teachers mentored by students in using ICT* project and how the mentoring program progressed through the two schools. There was a particular focus on two teachers to encourage a richer description of the program. One story, that of Odette, illustrated the ability of a teacher to continue her learning on her own whilst keeping in contact with her child mentors. The other story, that of Moira, illustrated a teacher's need for ongoing support that was able to be continually provided by her child mentors. As expected teachers learned new skills and gained confidence with certain aspects of ICT. Teachers also utilised those new skills in their classrooms and recognised other values inherent in the program. The next chapter will discuss the analysis of the child-to-teacher mentoring program and the diverse benefits as reported by all classroom teachers of both schools.

CHAPTER 5

PERCEIVED BENEFITS OF MENTORING: CLASSROOM TEACHERS

> The response from the teachers has been extremely positive. They feel that they have been taught lots and are very impressed by the manner in which the children presented the information.
>
> (Mountaintop coordinator, journal, 28/08/2006).

The previous chapter focused on the story of the child-to-adult mentoring program, how it progressed in the two schools involved and how it affected two specific teachers. It is important to note here, that after the exploration of Odette and Moira's stories, it was decided to expand the research question to include the teachers' recognition of other values inherent in the program as shown in italics in Figure 5.1.

> What <u>benefits</u> of student mentors in ICT do teachers report? In particular what is the <u>perceived effect</u> of this approach on the teachers' <u>skills</u>, <u>confidence</u> and <u>classroom practice</u> with ICT *and their recognition of other values* inherent in the program?

Figure 5.1. Key components of the newly expanded research question.

This was due to the fact that those two teachers reported much more than just their skills, confidence and classroom practice as benefits of the program. It was therefore decided that to fully explore the value of the child-to-adult mentoring program these other factors should be included. This chapter consequently looks more closely at the data and discusses their analysis in relation to the key components of the newly expanded research question as underlined in Figure 5.1. The data reported in this chapter are from all participating classroom teachers at both Mountaintop Primary School (Mountaintop) and Hillside Primary School (Hillside). It was decided that the teachers who were not in the classroom had significantly different roles to the classroom teachers and although it was important that they participated in the program, they could not have been expected to have responses in the classroom related data.

Throughout the analysis of the data, four key themes became apparent. Two of these related specifically to the research question. These were an increase in teachers' skills and confidence with ICT and a change in teachers' classroom practice with ICT. The other two themes came under the section of the research question that focused on recognition of other values inherent in the program. They were the recognition by teachers of the value of mentoring, and a realisation by the teachers that the students had untapped capabilities and potential that had not been previously recognised. These key benefits were representative of most teachers in the project. This chapter will expand on the analysis related to these four key themes.

5.1 SKILLS AND CONFIDENCE OF TEACHERS WITH ICT

Teachers reported improvement in personal skills and confidence with ICT within both qualitative and quantitative data. Across the teacher interview and journal data, these were the second most reported benefits after the teachers reporting of the change in their perception of the children within the project, which is discussed in section 5.3. Every teacher had something positive to report about personal confidence and skills with ICT. The quantitative data reported in this section came from the pre- and post-surveys and was recorded on a 0 to 10 scale. The following section reports on the results of the data analysis with reference to the teachers' skills and confidence with ICT. It includes their willingness to have-a-go at new computing applications, the link in the use of digital photography between their personal lives and school, and the child mentors' view of teachers' learning.

5.1.1 Teacher skills

The first mentoring session was focused on the use of the digital cameras, with further sessions elaborating on the use of photographs on the computer. Although seven of the fifteen classroom teachers did not have a digital camera at home, most classroom teachers had access to one at school. Only one classroom teacher reported previously using digital photographs in her classroom for reports and slideshows. Six other classroom teachers reported taking photographs and printing them straight from the camera, or having someone else print them for display purposes. It was not surprising then, as shown in Figure 5.2 that only two classroom teachers overall (both at Mountaintop) gave themselves a rating of above six out of a

possible ten when asked in the pre-survey: *How would you rate your level of ability with digital camera skills*?
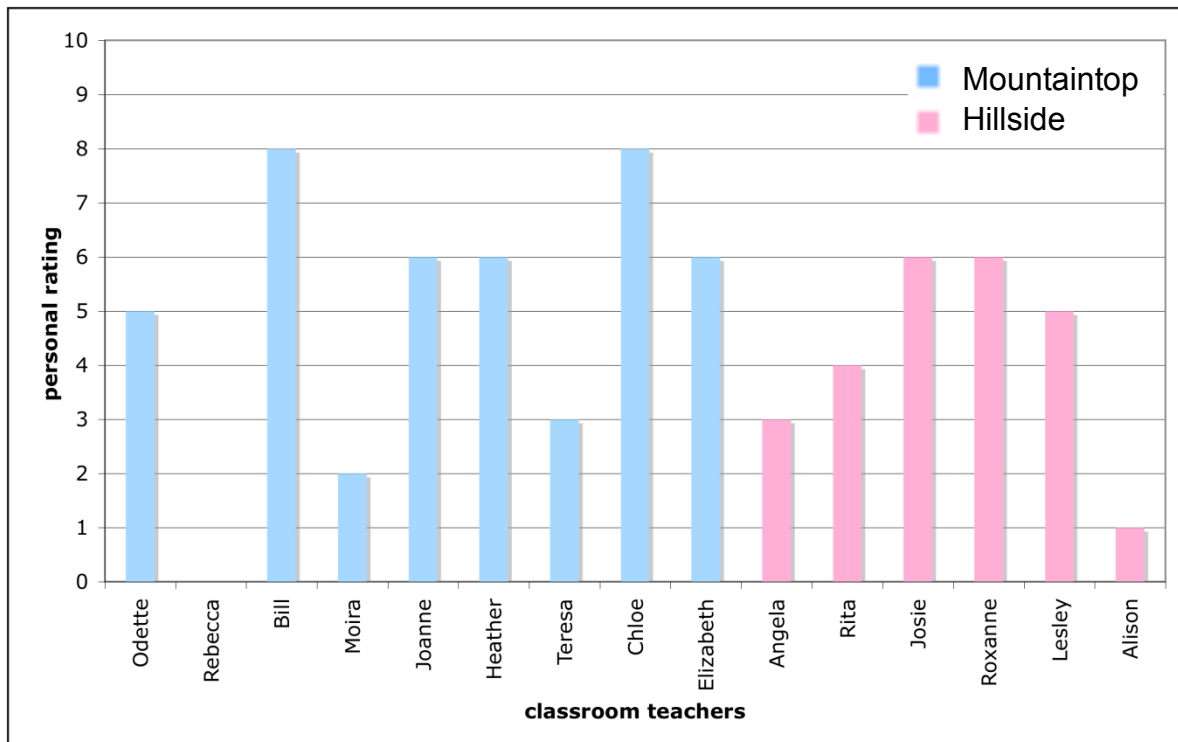
Figure 5.2. Teachers' skills with digital cameras at the commencement of the project.

Of the other classroom teachers at Mountaintop three teachers rated themselves a six, but the final four classroom teachers rated themselves as a five, three, two and zero respectively. Hillside was not much different with two teachers rating themselves a six in level of ability with digital cameras and the final four classroom teachers rating themselves as a five, four, three, and one respectively. The mean over the two schools was 4.6 with Mountaintop's mean only marginally above Hillside's.

When the post-survey was completed, the data were analysed to see the reported improvement in the teachers' ratings. All classroom teachers across both schools reported an increase of at least one point with one teacher reporting an improvement of six points from zero to six. The mean increase across both schools was 2.9 with Hillside's mean marginally above that of Mountaintop. The change in reported digital camera skills is shown in Figure 5.3 with each school in a separate graph. At the completion of the project all teachers rated themselves at five or above.

These self-rating data are consistent with an improvement in skills observed with the digital cameras across the program.
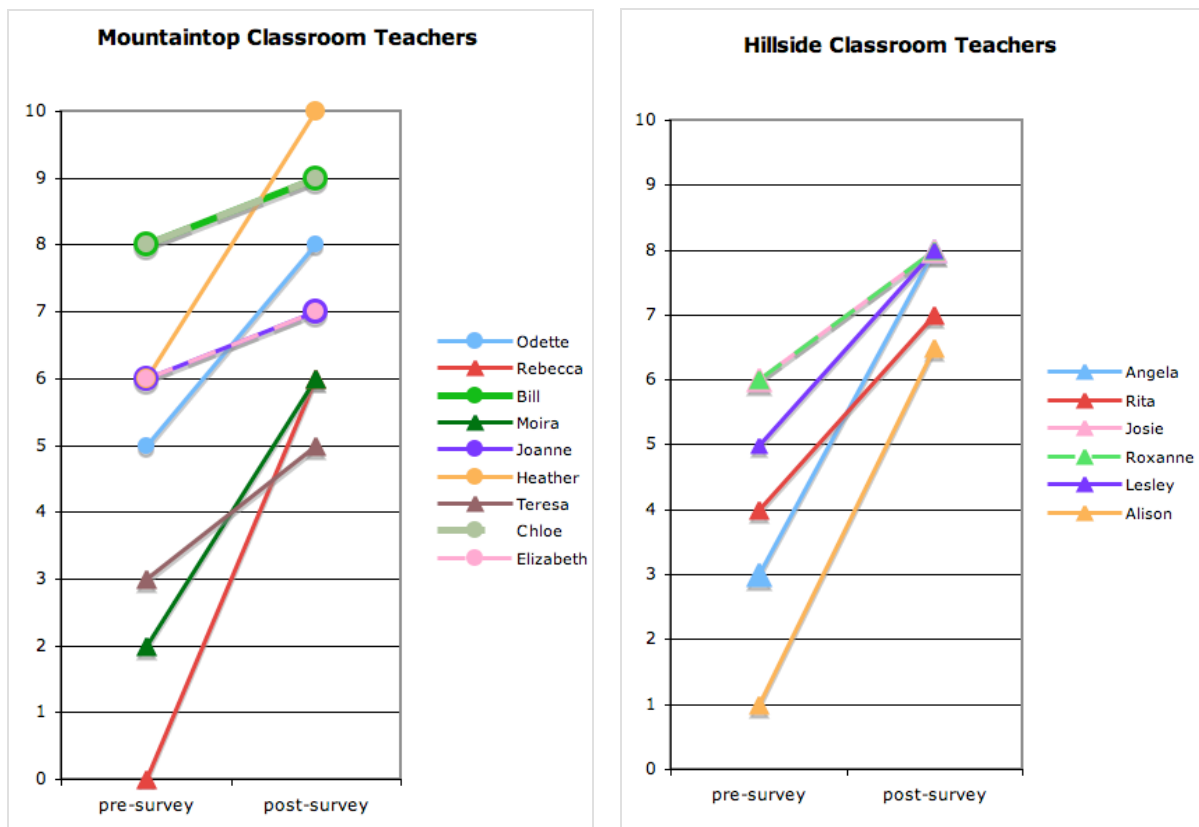
Figure 5.3. Improvement in digital camera skills from pre- to post-surveys.

In the graphs in Figure 5.3, triangles have been used to represent teachers with greater than 15 years of teaching experience whilst circles represent teachers with less than or equal to 15 years of experience. This was done in an attempt to explore further the data through different displays. It was interesting to note that the teachers with greater than 15 years of teaching experience at Mountaintop all started and finished with lower ratings than their colleagues, but they showed a mean of four points improvement compared to a mean of 1.8 in those teachers with less experience who started higher on the scale. At Hillside, all teachers were in the greater than 15 years teaching experience category. They also had larger improvement in camera skills with a mean of 3.4. Though it is easier to have a greater gain when starting lower on the scale, these data do imply that both confidence and rate of improvement may be related to years of experience and certainly indicate that further research is required in this area.

Evidence of this growth in reported camera skills was also apparent in the teachers' comments in both interviews and journals, as with Lesley who talked about her unease at the beginning because she "was worried that they might expect me to

know more than I did", but that unease soon abated and she was pleased with the broadness of her learning as she summarised in her interview:

> They've taught me how to, well the practicality of how to not just take a photo and use that particular camera, but how to then print off the photos or change the look of the photos and put the borders on and all those things. (16/10/2006)

She explained further in her journal when she summarised the final lesson by saying: "Final revision lesson, lots of reminiscing and reviewing, I'm actually surprised at how much I've taken in!" (nd).

The teachers seemed to be surprised at the amount they learned and its value for them personally and in their teaching. This in turn had an effect on their confidence in the use of the digital cameras and related software.

5.1.2   Confidence

The teachers were learning about the digital cameras and related software and also seemed to be gaining in confidence with both. Comments like this from the teacher of the mentor class at Hillside show the impact on the learning and confidence of the teachers:

> I love that and one particular staff member who can barely use a computer can now download the photos, she did it for me the other day … she knew which file it was in and she did it in [the principal's] office because it's the only place to print colour photos, and she was very proud of herself. (Angela, interview, 16/10/2006)

Of the 15 classroom teachers who completed the program and surveys, 12 reported improvement in their confidence with using technology. As Figure 5.4 shows, at Mountaintop three teachers showed no increase in their already high confidence ratings of eight or nine (two on eight and one on nine). All other teachers recorded an increase with three teachers recording a one point increase, two teachers recording a two point increase and one teacher recording a four point increase from five to nine. At Hillside all teachers recorded an increase, with one teacher recording a one point increase, two teachers recording a two point increase and two teachers recording a three point increase. The final teacher, incidentally the teacher Angela commented on in her interview, had the largest increase of six points on the confidence scale.
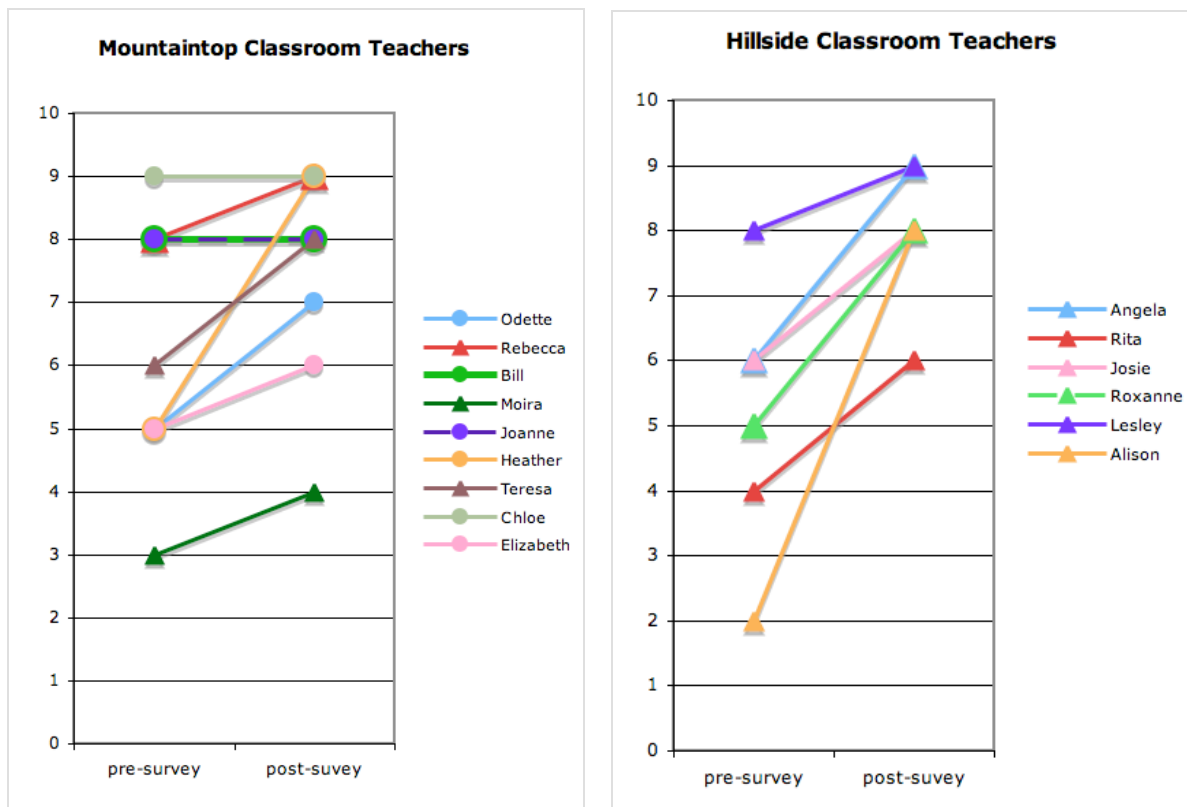
Figure 5.4. Improvement in teacher confidence between pre- and post-surveys.

Apart from one teacher, all classroom teachers across both schools recorded a post-survey rating of six or above, with only four of the fifteen recording a final confidence rating of below eight out of a possible ten. It should be noted that the teacher with the lowest increase in confidence rating, from three to four is Moira, the subject of the second teacher's story. Heather, with a pre-survey rating of five and a post survey rating of nine made Mountaintop's greatest confidence gain. This increase was only surpassed by Alison, a Hillside teacher who moved from a rating of two to a rating of eight.

In both interviews and journals, teachers reported an across the board increase in confidence gained, including personal confidence with the technology, confidence to learn more about technology and confidence to teach with technology. Figure 5.5 shows the number of teacher statements (references) reporting teacher skills and confidence with ICT across all classroom teachers.
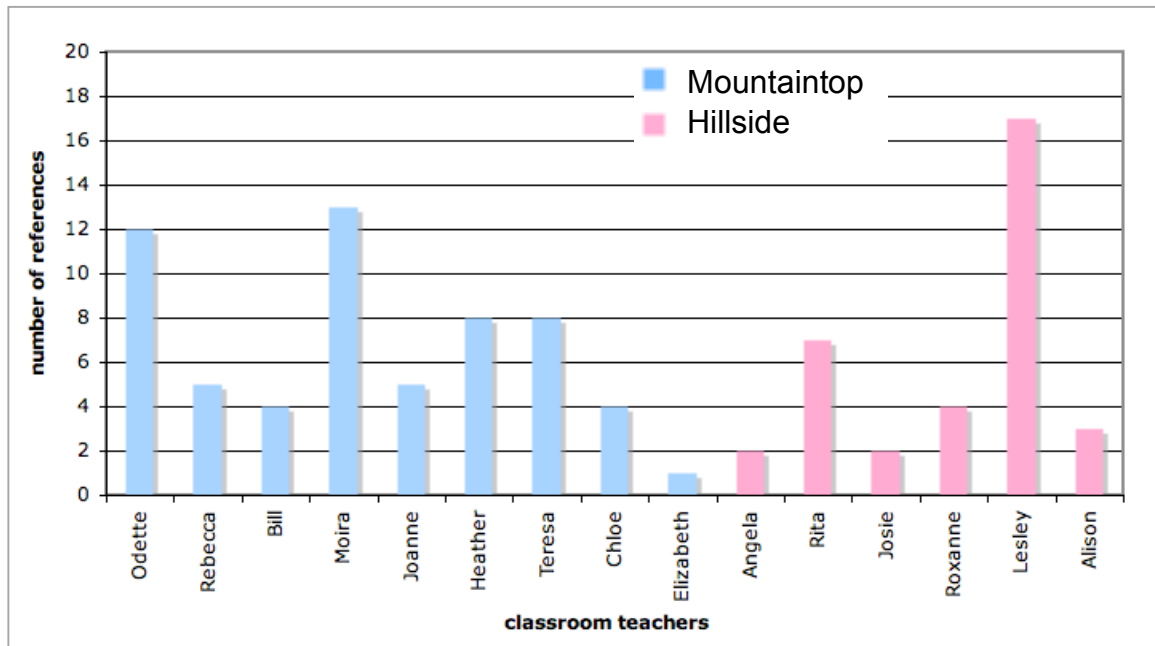
Figure 5.5. Classroom teacher statements reporting benefit: Teacher skills and confidence with ICT.

Josie linked her knowledge and confidence together when she stated: "I have gained confidence in using the technology. I have gained knowledge, well knowledge how to use it and then that's the confidence" (interview, 30/10/2006). One conjecture of this research was that with an increase of confidence along with the combination of new knowledge and skills, teachers would begin to integrate the use of the digital cameras and related software into their classrooms. To do this teachers would need to have confidence, but also a *have-a-go* attitude in reference to the use of ICT.

5.1.3   Willingness to try new computing applications

It was presumed prior to the project that teachers' confidence and skills would be tied to their willingness to try new ICT components; therefore teachers were asked to rate their willingness to have-a-go at new computing applications in the pre- and post-surveys. Figure 5.6 shows the change from the first to the second survey. Interestingly all but two teachers rated themselves at seven or above to begin the project, obviously most feeling they were very willing to try new ICT components. At the conclusion of the project all teachers rated themselves at seven or above.
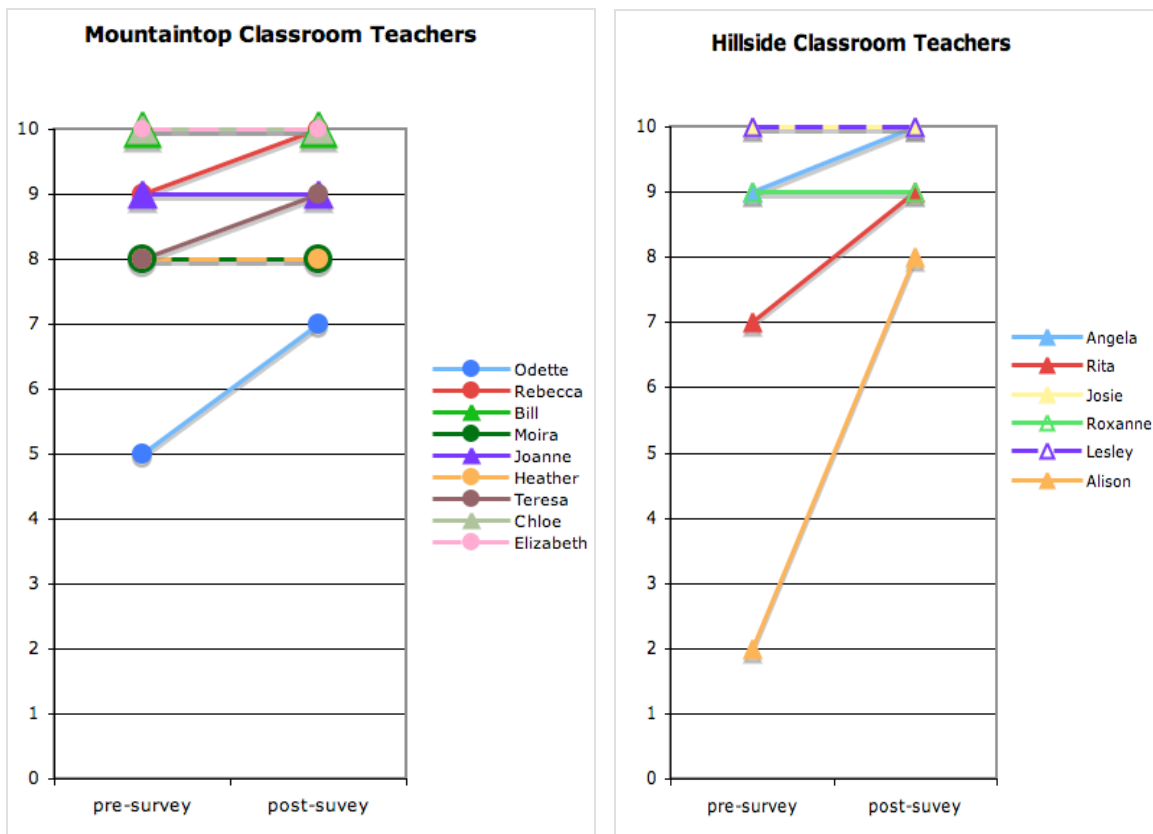
Figure 5.6. Improvement in have-a-go rating between pre- and post-surveys.

At both schools some classroom teachers rated themselves as a 10 on the pre-survey scale, so they could show no improvement (Mountaintop, *n*=3; Hillside, *n*=2). When these data were excluded, the mean improvement in have-a-go at Mountaintop was 0.7 and at Hillside was 2.3. This was understandable as more teachers at Mountaintop started higher on the scale so had less room for improvement. Once again Hillside's results raise the question: Is improvement in willingness to try, once confidence is boosted, affected by teachers' years of experience? This is certainly an area for further research.

Overall at Mountaintop there were six classroom teachers who did not change at all in their "have-a-go" attitude, however two improved by one point and the person lowest on the scale increased two points. At Hillside, three teachers did not change at all, however two teachers increased by one and two respectively and one teacher made a large jump from two to eight. The teacher that most improved both on confidence and willingness to have-a-go was Alison who was also second most improved in ability with the digital camera skills. When asked how she felt when told of the mentoring program Alison laughed as she said: "a bit sort of 'do we have to?'" She went on to say clarify: "once we got into it, it was fine, but I think teachers are

being asked to do everything and you just think "oh no, not another thing", but I have enjoyed it." When asked about how she felt after the first session she stated: "I felt alright because I'd got used to the idea … even though I might not be that good at it I go along and try" (interview, 10/10/2006).

Although Alison was due to retire at the end of year, and was a little reticent to begin the project, her "have-a-go" attitude helped her to achieve growth in both skills and confidence. She even began to talk enthusiastically about the use of digital photos in the classroom as the following statement in her interview shows: "When we go on our Italian excursion, I will take the camera and take some photos and when we come back, we always do a recount anyway, but it will be far more exciting with the pictures" (Alison, interview, 10/10/2006). Alison came a long way in the project and was really pleased with her growth.

5.1.4   Linking home and school

For many teachers the fact that the digital camera was a useful item in their personal lives as well as their teaching was valuable. A number of teachers mentioned the use of cameras out of school and how they had applied what they had learned in the child-to-adult mentoring sessions in their personal lives.   Lesley showed her confidence to take photos extending to her classroom and home when she commented in her journal between sessions that she "began to confidently take photos of the Prep children as well as my own family at home" (Lesley, journal, between sessions). Rebecca had progressed past the taking of photos on her overseas holiday to explain her confidence as a consequence of the mentoring sessions:

> I have got probably 2000 photos that I took while I was away and I really cannot wait for the holidays so I can get them on the computer and start to play with them and I wouldn't be able to feel confident if I hadn't had some experience with the kids. (interview, 06/12/2006)

Overall the teachers seemed to be incorporating their new skills with greater confidence both at school and in their private lives. The improvements shown in skills and confidence were obvious to all; even the child mentors commented on the teachers' learning as is described in the next section.

5.1.5   Mentors' view of teachers' learning

The children were very impressed by the quality and amount the teachers learned. Some like Violet started with the impression that the teachers already knew what they were doing and that they were just pretending they didn't know about the cameras and computer software, but they soon realised that they were actually teaching the teachers. This is explained in Violet's interview comment:

> She probably knew stuff that we didn't know. She's probably thinking in her head, 'oh, they missed something, that I know that they don't know, she might know some stuff about the camera. Like all the teachers probably know everything about the camera, we [the child mentors] know about half of it. (25/08/2006)

When probed further, Violet admitted that the teacher couldn't know how to use the camera because it was "the new, new one" and that in the sessions she realised that the teacher didn't know how to "download, what not to touch" and "about resolution" (interview, 25/08/2006).

Like Violet, many children seemed to think that the teachers knew everything. Sharon commented in her interview: "I felt a bit nervous. It was my first time doing it. I never taught a teacher. I thought a teacher knew everything" (23/10/2006). Tamsin stated similarly: "I was scared teaching a teacher because they know everything" (journal, final entry). One teacher, Josie, also noticed that the children were anxious about teaching them until "…they started to realise they knew things I didn't know, that was a good thing" (interview, 30/10/2006). As Janice wrote in her journal: "Interesting the teacher didn't really know what we were teaching her" (nd final entry).

It was important to see the improvement in teacher skills and confidence, and the fact that they were using the cameras to take photos was a good sign. The effect this had on their classroom practice will now be discussed.

5.2   CLASSROOM PRACTICE WITH ICT

Two key items stood out in teachers' statements about their classroom practice with ICT. These were additional use of ICT in their teaching and the use of mentors in extending the use of ICT in their classrooms. Other items of interest for teachers

included knowledge of their own learning styles and how that had influenced their teaching and the culture of their classrooms.

5.2.1 Additional use of ICT

Across the course of the program, all teachers commented with reference to the use of technology in their classrooms. Many teachers began the integration of ICT into their teaching and specifically into their classrooms after the first mentoring session. Others like Rebecca were slower in actually enacting the integration, but spoke of the confidence to be able to do so in the future:

> I have gained some knowledge and some skills. We've been working with some photos for a special event that is happening at the end of the year and just incidentally we played with some yesterday and I thought 'Oh, this is good, I know what the computer is capable of doing'. I wasn't actually doing it, I was watching someone but I was also building on what I'd learned and I thought 'No, I can do that'. So you know I felt confident that I've learned some skills that will be useful. (interview, 06/12/2006)

A number of teachers, like Teresa went a step further to discuss the options they were thinking about implementing. Teresa did this initially in her journal "Picasso portrait a year 5/6 possibility! CUBISM on the computer - will trial" (30/08/2006). She then went on to talk about some options in her interview:

> I thought I didn't need any of this but that cropping for doing Picasso would be a good thing with the older kids; just on a photo of themselves, just a self portrait thing so it is really boundless, isn't it. (06/09/2006)

Others like Roxanne talked of the new types of activities they were currently using in their classrooms:

> I just used it in the share time. We were doing symmetry so one group was doing pattern blocks so I took photos of them and their pattern blocks so then when they were all collected, I had a record. Some were doing these butterfly things and others were doing symmetrical and non-symmetrical pictures in magazines and I just took pictures of all the groups and I thought I'll put them up and get them to just write statements or maybe even put it in the maths share book. (Roxanne, interview, 23/10/2006)

Overall the classroom teachers all commented on classroom practice and the need to integrate what they had learned. Figure 5.7 shows the spread of responses from

teachers to the integration of the new skills and knowledge into their classroom practice.
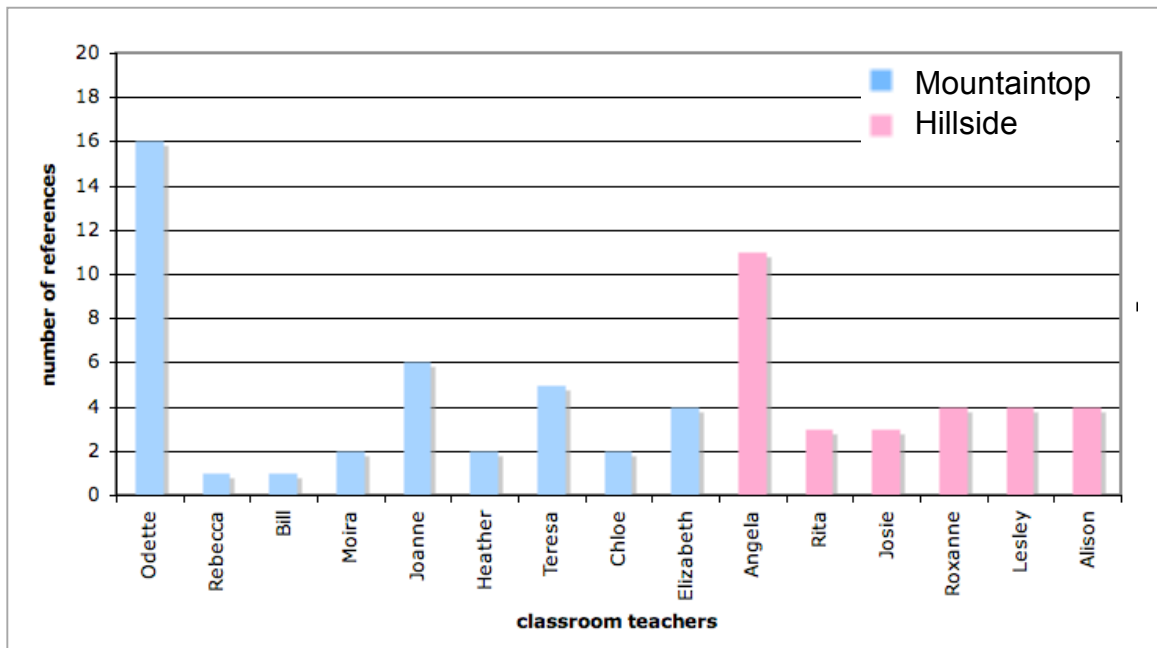
Figure 5.7. Teacher statements reporting benefit: Classroom practice.

Odette and Angela certainly stand out in the number of comments made on the topic of classroom practice. For Odette, the realisation that the mentors could be valuable in her classroom ensured she had many ICT mentoring incidents that had occurred in her classroom very soon after the commencement of the mentoring sessions to discuss. Angela, being the teacher of the class of mentors, but not being involved in their training, also discussed numerous immediate changes in her classroom, many of which were initiated by the children's enthusiasm to continue their ICT learning in their own classroom.

5.2.2   Use of mentoring in classrooms

As well as the value of the skills and confidence gained for their classroom practice, teachers also noted the value of mentoring for use in their classrooms. They valued the mentoring for their own learning, but also realised it was a tool they could use in their own classrooms. One teacher who spoke consistently about mentors was Odette (M1). Her story was told in Chapter 4, but it is pertinent to note here that she utilised her child mentors to assist in teaching her class how to use the cameras and had the mentors assist groups of children in their use of the digital cameras and related software. Even after the completion of the project, Odette further expanded the practice of mentoring as this one-year-later survey comment shows: "Have

adapted "mentoring" as practice for learning with ICT. Children are even teaching adults and classroom helpers how to use digital cameras" (29/08/2007).

Underlying the use of children as mentors in her class was the confidence Odette had in the children. Alongside her use of the child mentors in her classroom, Odette, like many other teachers regularly called on her mentors when she had issues with the digital cameras and related software.

Even one year after the project has finished, more than half of the teachers still have some ICT related contact with the children who mentored them. Moira reported in her one-year-later survey that she still calls upon them to assist her when she has forgotten, and Roxanne reported in her one-year-later survey that her mentors were in her grade this year so there was "constant interaction re reminders with downloading, sizing etc." This continued use of the mentors for support was useful for many of the teachers, though some teachers appreciated the information the children gave in the sessions but felt no need to gain further support from the children with the digital cameras and related software.

5.2.3   Recognition of the needs of the learners

For many teachers being in the structured position of learner was unusual. During this time, many of the teachers had the time to explore aspects of their personal learning style. All classroom teachers commented in one way or another on how they preferred to learn in a hands-on environment. As Chloe stated in her interview:

> If I do something I remember it better … because I had a go at doing it and so I now remember it. So if I were to go and do it, I can just think back to what I did… It's good to be hands on for a change… Rather than sitting there and listening. (06/09/2006)

Other teachers concurred with Chloe to show their preference for a hands-on learning style. Some of their comments are noted here: "I just have to be hands on and practise" (Heather, interview, 06/09/2006), "I'm actually more an active learner. I need to be able to fiddle with the equipment and be able to play with it and practise it and go over it a few times" (Rebecca, interview, 06/12/2006) and "I'd say to the kids 'Just show me, then I have to do it myself and tell me. I'll do it while you're telling me, don't do it for me', otherwise I knew I wouldn't know how to do it" (Angela, interview, 16/10/2006).

As Figure 5.8 shows all classroom teachers reported preferring a hands-on learning style with Mountaintop teachers having a much higher reporting rate.
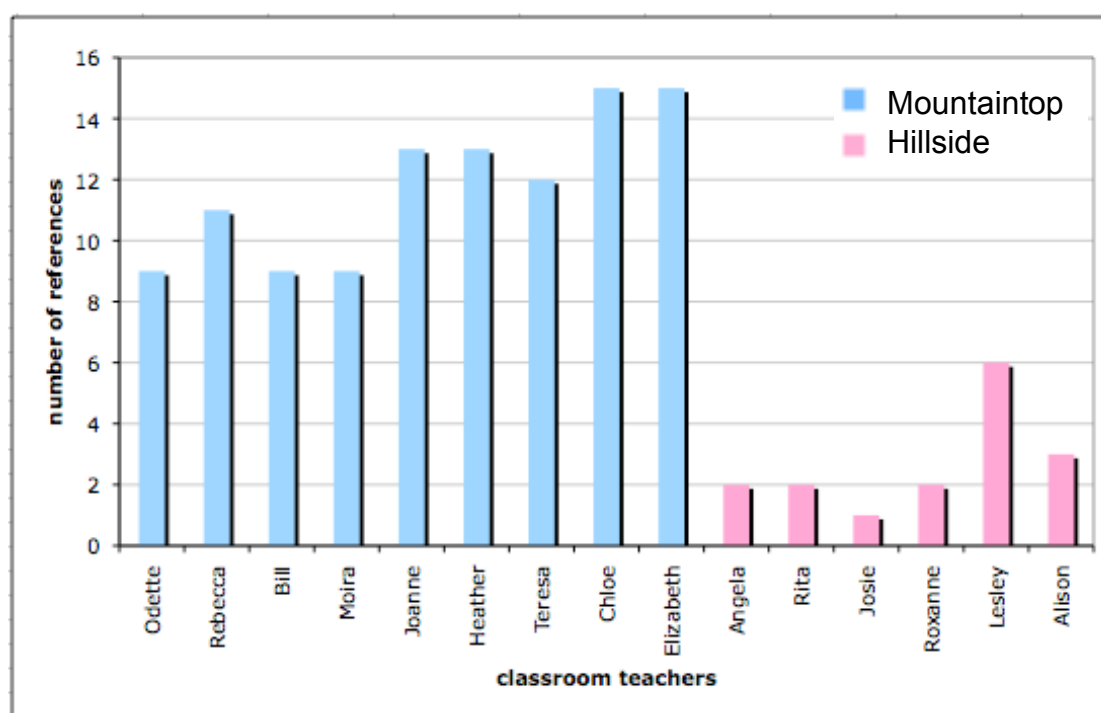
Figure 5.8. Teacher statements reporting benefit: Hands-on learning style.

From the teachers' realisation of the value for them of a hands-on learning style, came a more tangible awareness of their students' learning styles and the realisation that most of the children they taught were also hands-on learners. Elizabeth went further to mention this in relation to how she taught, as she had confirmed that hands-on learning was her preferred learning style:

> I am very hands on, I have a go and if it doesn't work it is okay, I can undo, especially with computers. … I am a hands on, definitely a hands on, and "have a go" and "you have a go now let me have a go", so which I hope that is how I teach. (interview, 25/08/2006)

Interestingly one non-classroom teacher, Kat mentioned in her interview that the sessions she prepared for adults were quite formal and structured and she commented on the changes she may make to them as a consequence of her knowledge of her own learning style preference: "Maybe I need to get more hands on with adults and maybe some more fun" (30/08/2006).

One principal also commented on the hands-on learning styles of the children and how this made the project all that more successful for the school as they were now "…certainly making an effort to building more hands-on activities here as a result of

this program … and providing those rich learning opportunities which involve children getting their hands on… as we've seen with the program it's just been such a success because kids have had the opportunity to have hands on" (Philip, interview, 30/10/2006).

5.2.4 Classroom culture

With the change in recognition of the value of hands-on learning, other classroom changes also began to occur. Rebecca commented on the change in her classroom practice with regard to the teaching culture in her classroom. Since the project she felt it was okay to ask a child for assistance. She said that previously she would veil her question so it would not appear that she was the one needing assistance, but now she was happy to ask children to assist her, this statement shows:

> It makes it okay to ask a child to teach you. It sort of, sometimes you think if I ask a child to help me everyone will think I'm dumb, but if it's OK for a child to teach, if you make that the sort of the culture of the classroom, that it's OK to teach someone else, then I think that's valuable and it does change your thinking. You know I'm quite happy to ask someone to show me and it's hard to admit and being an older person you do have to admit you don't know a lot about computers … So, I'm still prepared for children to, you know, I'd be quite happy for them to show me what they know sometimes. (interview, 06/12/2006)

Classrooms also changed with the integration of the mentoring process in individual classes. Though not as formal as in the project, some teachers utilised either their mentors, or other students in their own class to act as a "specialist" in certain areas of expertise. This has been covered in Odette's story in Chapter 4 and is further discussed in the *value of mentoring* section (5.3.2.1) later in this chapter. What this has meant for those classrooms is that the teacher was now seen as not the only teacher in that classroom and that the children felt comfortable to ask others for assistance when the teacher was busy, or when the others had more expertise in a specific area.

5.2.5 One year later

These changes in classroom practice were good, but sustainability was important. In a survey given to available teachers one year after the completion of the project, all teachers except Moira who had moved from her classroom/specialist role to more

focused specialist role, said they were using ICT more than they were a year ago. Examples of use mentioned ranged from use of programs and hardware such as Excel, PowerPoint, Scratch, Photostory, Publisher, myclasses and data projectors, to more specific use such as word tables, inserting photos, Internet resources, online texts, Teacher Tube, PowerPoint, labs for maths, problem solving in Excel, all inquiry work, email, photographs, researching and homework. Teacher preparation of classroom tasks and administrative uses were also mentioned.

This sustained and extended use of ICT was reported in the one-year-later survey as a direct result of the child-to-adult mentoring program. As Angela, who progressed in confidence from a six to a nine throughout the project, stated one year after the completion of the project: "Computers in the classroom would be in use from 9:00 till 3:30 every day … I feel confident to try new ideas and practices … I know I can ask any one in the right space, including students, for help" (2007). She felt her continued and expanded use of computers was due to her increased confidence.

The benefits of the program for the teachers' skills, confidence and classroom have been discussed, but there were other benefits also that were reported by the participating teachers. The next section will explore the added benefits implicit in the program.

5.3 OTHER BENEFITS IMPLICIT IN THE PROGRAM

The key benefits that came from the program that were not directly related to the teachers' skills, knowledge and classroom practice were those focusing on the capabilities and potential of the child mentors and children in general; a recognition of the value of mentoring and its uses for teachers' professional development and also in the classroom; and the realisation that children can be responsible for their own learning. These two key benefits will be elaborated on further here.

5.3.1 Focus on the children

A group of fifteen classroom teachers began the program with the hope for something that might assist them in the use of digital cameras and related software in their teaching. What came from the program was much more than that. The teachers all increased in confidence and skills in the use of digital cameras and related

software. They also gained valuable focus on uses for these items in their classrooms. Apart from these expected outcomes, teachers gained an understanding of the value of such mentoring professional development programs for both themselves and the child mentors involved. These values were wide ranging from improvement in personal relationships to the development of a child-to-child mentoring system across grades in one school.

5.3.1.1 Knowledge of students, their capabilities and potential

The teachers' perception of the children changed throughout the course of the project. Many teachers started the project, not fully understanding what they had signed up for and were actually surprised that they gained anything from the sessions. Although not a classroom teacher, Barbara's comment in her interview summed up the way some teachers felt:

> I loved the fact that they thought they were teaching me something. They got a real kick out of it and some of those questions were genuine because I didn't know, I really didn't know. … I think if that type of strategy continued I think they'd see us even more as co-learners rather than as I am the authority … but I think in that case I mean I was happy to be the learner and they thought they were so clever because they were teaching me something. (16/12/2006)

In both teacher interviews and journals, the teachers' perceptions of the children were uppermost in their comments, with all classroom teachers remarking on the abilities and potential of the child mentors. There were a total of 122 comments coded to this category. As seen in figure 5.9, the teacher who commented most about the children's abilities and potential was Teresa.
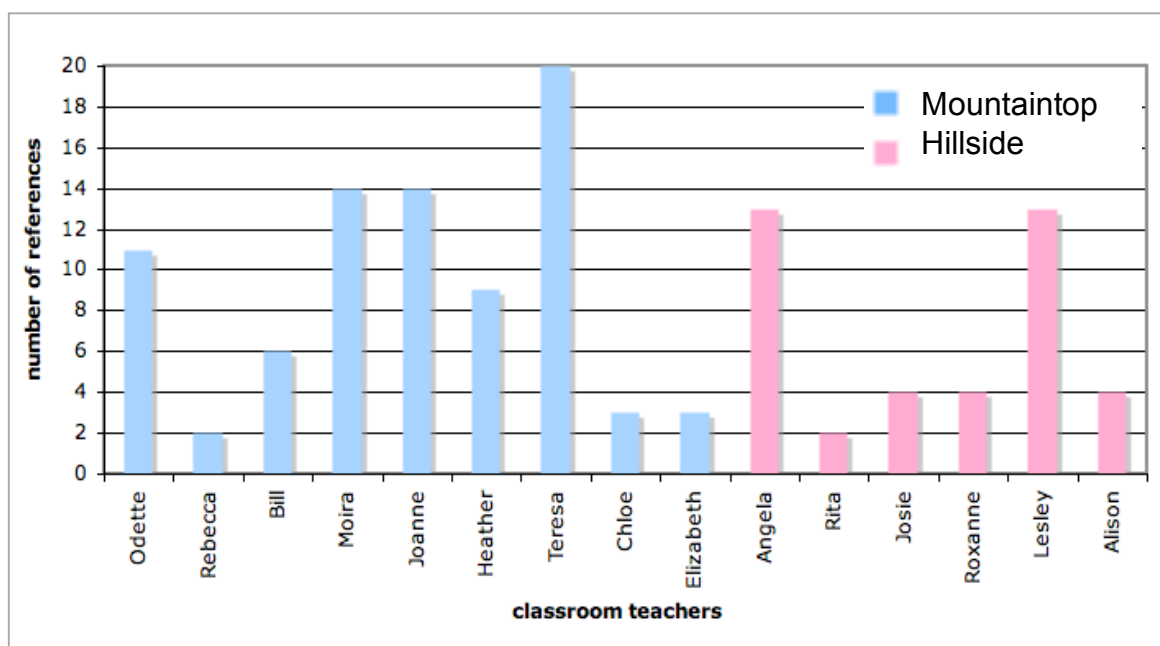
Figure 5.9. Teacher statements reporting benefit: Teachers' perception of the children.

Teresa made 20 comments about the children that varied in range from comments that specifically focused on their teaching style, to comments about their confidence, attitude and team work. Figure 5.10 shows the broadness of just one of those 20 comments coded from her journal (22/08/2006) under the heading mentors.

- Very thorough -" knew their stuff" and were confident.
- Worked well as a team. Able to take a lead from each other/prompt each other.
- Very cooperative. Took turns to contribute.
- Self corrected and used mistakes to reinforce a toolbar function.
- "Would you like to try. . . ?"= practical.
- "Oh, I know what happened. . . "
- No sense of failure or this too hard. So it pays the instruction was good.
- Used wait time well.

Figure 5.10. Teresa's reflections on mentors.

Although Rebecca, only made two comments on the children, they were very insightful as this example from her interview shows:

> These little ones, the younger ones, the Grade Threes and Fours actually made me do it and they handed me the camera, they didn't say "Here I'll do it for you and show you". They actually made me do it so that was really useful. (06/12/2006)

Rebecca understood that the children were utilising her learning style and this made her learning easier. She was also impressed as a teacher of Grade 3/4 that these young children were able to do this.

5.3.1.2 Grade 3/4 children

The basis for the program was the mentoring of the teachers by the children in a Grade 3/4 class. The children were very eager to share what they had learned with the teachers and the teachers noticed this as Roxanne commented in her interview: "I think the kids are anxious to please and they love showing you again. It also gives them confidence in 'I know how to do it'". (23/10/2006). The use of Grade 3/4 children was a benefit for the teachers for various reasons, which will be elaborated on here. Initially some teachers were concerned about the age of the children and thought them too young to be of any value in mentoring teachers. This opinion changed rapidly as the teachers actually worked with the children and saw their confidence, knowledge and skills were highly appropriate for the teachers' needs. This led one teacher at the completion of the program to question how young a mentor could actually be:

> I probably didn't really think that kids that young would be [able]. We are stuck
> up there with the older kids and we know and expect it of them, but I probably
> didn't realise they could do that so well. … It's surprising with one so young,
> how young can you go? (Teresa, interview, 06/09/2006)

The teachers also became dependent on their mentors and many commented that they were pleased the mentors were not in Grade 6 as they didn't want to lose them at the end of the year. As Lesley stated, "the idea of using that middle school I found was great because I think getting to this stage of the year if it had of (sic) been Grade 6 I would be a bit panicky that I was losing my mentors" (interview, 16/10/2006). Josie's interview comment went further to suggest the mentors would be able to train other children too before moving on to secondary schools. She summed up both the aspect of the children's age and the longevity of their time at the school and was representative of many teachers when she stated:

> Wasn't quite sure of the idea of the younger kids being the mentors, usually,
> you know, [we are] so used to the Grade 6 [children] doing everything. But
> now that I see how well, particularly the two I had, handled it and the fact that

they are still in the school for a few years and to teach others, I think that is the key to its success. (30/10/2006)

The teachers also appreciated the personal characteristics of the children. Realising the children were non-judgemental, and could explain information in a way that was complementary to the teachers' learning was an unexpected benefit. Throughout the project the teachers felt encouraged and supported in their learning by the children. Lesley's and Rebecca's interview comments show the value of the children's personalities and teaching styles and were representative of the expressions of many teachers:

> So with the boys I felt more confident in saying, "okay watch me while I'm doing it, help me out", but I could still go back and get them the second time and know that they weren't going to judge, and I don't think any children would but it just made me feel more comfortable about it all. (Lesley, 16/10/2006)

> I felt that the children were probably a bit more patient or a bit more flexible. I could manipulate them a little bit more by saying slow down, show me how to do that again. Whereas probably with an adult that I was a bit concerned about I might be a bit more reluctant to show my weaknesses. … I was a bit more game to make mistakes probably with the kids because … they'd give me time to play with it again, you know try it again. (Rebecca, 06/12/2006)

5.3.1.3 Teachers' feelings of inclination or obligation to assist the children

Although the teachers were supposed to be the learners in this child-to-adult mentoring situation, most also found it difficult to remove themselves from the teaching role. Generally this did not mean actually teaching content to the children, although this did happen in two sessions, but the majority of teachers saw the chance to encourage the children who shone in this role but also to support those who were less prominent in the sessions. As Josie stated in her interview she was eager to ensure both girls were involved: "Libby was quieter than Tamsin. Tamsin is pretty confident so I sort of felt I had to drag Libby in a little bit, you know, 'What do you think Libby?' and 'What should I do now?'" (30/10/2006).

Many classroom teachers commented on the abilities of children who they thought were academically weak, but seemed to be great mentors. In each school a particular child stood out as one who was not expected to be a great mentor, but who

was actually one of the best. Both children were academically weak and had struggled throughout their schooling so, for the teachers, classroom, mentees and principals alike, it was very affirming of the project to be able to boost the self-esteem of students like these. As the principal of one school stated:

> The most interesting thing in the staffroom has been to hear the staff talk about children who are learning to recognise the capacity to impart that knowledge. It's been a wonderful thing for staff to realise that some kids might not be naturally gifted in some curriculum areas but still have the capacity to impart knowledge to adults. (Peter, interview, 13/12/2006)

These children, although seen as academically weak students, gained more from the project than most others because they had started with low confidence and self-esteem. When asked which children she would have picked prior to the mentoring program as those most likely to be successful mentors, Angela's interview comments show just how these children may have been overlooked and how much they could have missed out on:

> I would think that I probably wouldn't have picked Denis … Denis especially because he's academically, you know he's probably not as strong as the others and he's probably been the most confident in his approach to it … but Denis you would never have thought he'd be able to explain the way he did, or show people the way he did and do what he could do from previous experience but he was probably the strongest in the end. (16/10/2006)

As the classroom teacher of the mentors, Angela had some very useful insights. The researcher provided the mentoring on digital camera and related software sessions to the children in Angela's class, so Angela was free to be mentored in the same way as all other teachers. The big difference was that Angela had a deeper insight into the children and the changes that occurred for them throughout the project.

5.3.1.4 Changed relationship with children

Many teachers commented on a change in the relationship they had with their mentors. Bill commented in his journal that he had a profound change in opinion of the boy who he had previously only had a number of "reprimanding encounters on the yard" with. When he was told he had Andrew as one of his mentors, he noted in his journal that he was "VERY keen to see Doug and Andrew for their own true colours, free from any pre-conceived notions" (Bill, nd). He later relayed in his

interview the change in rapport between himself and Andrew, which had previously been quite strained:

> Andrew comes up to me whenever he sees me and he is just bursting with fervour. "Hi Mr. B" and "How are you" and it has developed a very good rapport between Andrew and I which is quite contrary to what I told you before. I just simply didn't know him. (25/08/2006)

This increase in teacher knowledge of the children involved in the program is incidental to the program but adds another facet to teacher professional development that has value for the whole school community.

5.3.1.5 Relationship skills developed between child mentors

The teachers also commented on the relationships that students in the mentoring pairs and trios exhibited. The teamwork and intuitiveness they showed was more obvious in some groupings than others. One pair of boys had a particularly one-sided first session where the dominant child was almost rude in excluding his partner. Both teacher and researcher noticed this and the researcher decided to speak to the boys before their next session. A subtle mention was made to the boys just before the second session of how much one had offered to the first session and that it might be a good idea for the other boy to take the lead in the second session. The second session went particularly well with no-one dominating and all seemed to have been settled. It was interesting to hear the comment that came from the quieter of the two boys in his interview when he was asked to tell about his first very interesting mentoring session. He started by saying: "When I was trying to speak Andrew kept on interrupting and saying everything, like I didn't really get to have a shot." When prompted as to how he was feeling he took a while but finally responded: "A bit upset." When asked if he said anything to Andrew, he replied: "At playtime I said to him, 'you can help me, but don't get too overboard' … He took that good … Then it was much better because the only time he spoke was when I didn't know anything, so he was a good helper" (Doug, interview, 25/08/2006).

Although the researcher did assist in this situation, Doug made it obvious that even these young children, given the confidence, were actually able to sort out those issues between themselves. The teamwork between the two boys continued to improve throughout the sessions although they had a very rocky start. As well as

working out issues like those of Doug and Andrew, all children showed that they were able to rely on, and develop teamwork skills that enabled the efficient mentoring of staff. Teresa's very comprehensive interview comment on her mentors, Milly and Ruth, shows the different facets of this relationship:

> I was very impressed about the way they worked together. I don't know if they were friends already but [they were] just so give and take in the way they did things without one jumping in and talking over the top of each other, when that one started to speak that one backed off a bit and this one gave that one a turn. They really enjoyed what they were doing, so for a learner it's got to be so much easier to take in what somebody is saying when they're relaxed and not pressurised. Very well prepared. Initially they started with all these notes and they worked through steps. By the end they didn't seem to be going from anything, they just knew what the next step was going to be and must have been making some sort of judgements themselves on what I should do next and they were evaluating something I did to say "oh well go and do this one". In a group, two of them, I saw some groups with threes, I think that's a really good thing for all age groups working like that, with them bouncing off each other and who knows who the strength was in the end out of those two girls because you couldn't really tell and you would think "oh this one is leading" and then it would reverse around. So I would say that they benefited equally from each other, they were modelling to each other the whole time. Just an absolute by-product of the whole thing. (06/09/2006)

These comments show a very complex relationship between the two girls that was obviously of great value to the teacher being mentored. The following section will look more closely at the value of the mentoring process for both teachers and students involved.

5.3.2   Focus on the mentoring

Although recognition of the value of mentoring was not discussed by all classroom teachers, with only eleven of the fifteen referring directly to it, it was clearly an important benefit to over 70% of the participating classroom teachers. Teachers commented on the value of the mentoring for themselves and also the children involved.

5.3.2.1 Recognition of the value of mentoring

When the comments were collated on the recognition of the value of mentoring as reported by the classroom teachers in both journals and interviews, Odette stood out in the amount and complexity of remarks as shown in Figure 5.11. This was due to the fact that she was using her mentors in her own classroom to assist her to teach the students. Although others used their mentors to assist them in their classroom teaching, Odette, as described in Chapter 4, was the only teacher in the project to actively integrate her mentors into her classroom teaching.
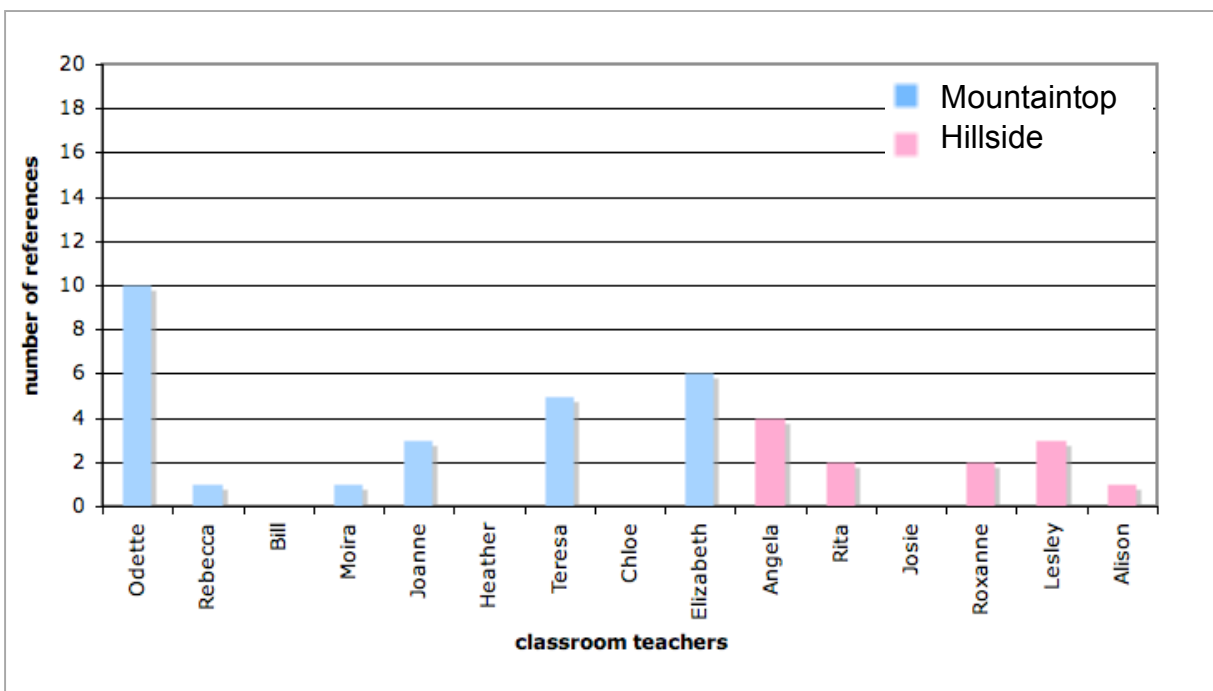
Figure 5.11. Teacher statements reporting benefit: Power of mentoring.

Figure 5.11 shows the spread of responses on the power of mentoring and also identifies that four teachers did not comment on this at all. As this was not a direct question in the survey or interview and only arose when teachers spoke or wrote of it, it was actually well represented in the data.

Many classroom teachers discussed the possibilities of applying the mentoring process to their classrooms. Teresa connected the idea of mentoring and the fact that you really need to understand your topic to teach it to someone else in her interview comment:

> It makes you wonder what you could apply across too, what things could be
> taught that way … there is so much potential to have 26 teachers in the room

and we probably don't use it as much as we could … that's real understanding. Particularly if you can teach someone who has got no idea. (06/09/2006)

It was important to bring out this point. For the children to be successful mentors they had to understand the content they were imparting. The children felt the "pressure" of having to teach someone else and this ensured they learned the content well. What an effective way to have all children in your class gain the necessary knowledge and skills. As Lesley observed in her interview, this meant that anyone could be a mentor given the incentive:

> I thought anyone can do it. It actually made me realise that anybody, any child within that room would probably have been very good with the guidance of someone like yourself … I'm glad to know that Denis will still be here next year. And in a way the others within the classroom could all, you know, I could call on any of them because they all know the skills now. (16/10/2006)

Teachers went on to use the idea of mentoring in their classrooms in a variety of ways that assisted in the learning of both teachers and children. There were two teachers in the project who understood the value of the child mentors more than all others. These were the teachers of each school's class of mentoring children.

5.3.3 Teachers of mentor classes

Changes in teachers' classrooms that occurred due to involvement were not always focused on the use of technology. Two teachers who had considerably more insight into the project, and especially the child mentors were their classroom teachers. Elizabeth and Angela had made particular reference to the value of the project for their teaching and classrooms specifically. The ability for every child in the mentoring project to learn about the digital cameras and related software and to impart their knowledge and skills in a coherent way to the teachers they mentored was fundamental to the success of the project. The teachers of those children were as amazed as anyone that the children were all so successful. Not one child, once the mentoring began, had any difficulty imparting their learning to the teachers and their teachers also saw the children grow in confidence in a range of unrelated areas. Elizabeth was a partner with the researcher in the training of her class of mentors so she had many insights into the children's learning. In Angela's case, she was not involved in the training and this gave her a unique perspective on the children, as a mentee, but also as their classroom teacher. Many things changed in Angela's

classroom as a consequence of this. In her interview, survey and journal she spoke confidently of the responsibility the children now felt for their own learning and the changes she had made as a consequence of that.

5.3.3.1 Children responsible for own learning

Angela's comments on the mentor children in her class were spread throughout her interview and journal. She was pleased with the children's improved confidence and this encouraged her to change a few processes in her classroom. This led to the children taking an increased degree of responsibility for their own learning, as well as the learning of others as described in her interview:

> I think the little ones in this classroom, even the Grade 3s, accept more responsibility. I think before that they were quite happy to let the Grade 4s be the leaders in the room, but the minute they actually had to do something and then show somebody else, I think they thought "Oh, ooh, we've actually got to show somebody so we can't just sit here", and because of the way they've reacted to that even the way I run news time on Mondays, I've changed that, they sit in a little group and someone's there and they never know who I am going to ask to report back because I say to them "You never know when the responsibility is going to fall back on you" and they have to sit there and sometimes each person has to say one thing someone in the group said and sometimes I make one person repeat everything so its making them realise they never know what responsibilities can fall back on them. (16/10/2006)

This comment is indicative of the changes made in Angela's classroom as a consequence of the project. Previously the children were able to avoid participating in their learning. Now the children have been made more responsible by a change in practice and expectations of the classroom teacher.

5.3.3.2 Domino learning

Angela often used the term *domino learning,* which described the flow on of knowledge and skills that was now evident in her classroom every day. She was so impressed with the way the children learned from each other and went on to teach further, that she initiated this practice in her classroom. Initially this was only with computers as she said she realised "the huge advantage in motivating and engaging students in valuable learning and imparting of their own knowledge through computer

use" (Angela, one year later survey, 19/09/2007). She went on in the survey to say that she knew she could "utilise the domino affect of one expert group of students to work with the next group of students, who then subsequently use their knowledge with the next group etc. This actually makes teaching easier for me, and gives students a great sense of ownership and responsibility" (19/09/2007).

Angela moved to another school at the end of the year of the project, but has taken with her the knowledge and skills she gained in being the classroom teacher of the mentors at one school and in being mentored by two of the children. This has allowed her to extend the use of mentoring within her new classroom and to adapt her classroom techniques to assist the children to learn effectively so that they may pass on their learning to others.

As previously noted, the child mentors were key to this whole process for the teachers. They were initially involved because the researcher believed that their confidence and knowledge in the area of ICT would enable them to impart ICT knowledge and skills to teachers in a more succinct and useful way than other professional development models could. This perceived ability to know ICT and to be able to impart it was a key component of the program. It is now also evident that the child mentors were gaining more than expected from the project.

These assorted benefits discussed by the classroom teachers and specifically the classroom teachers of the mentors, give an idea of the common, but also in some cases varied, impact of the program on the classroom teachers at both schools. These benefits, once realised, also influenced changes in the analysis of the data and the approach that was taken in the project. As a consequence of findings in the program, there were changes made to the original diagram of assumptions underpinning mentoring in a child-to-teacher mentoring professional development. This in turn led to changes in the features of the program. The changes in the assumptions underpinning mentoring in a child-to-teacher mentoring professional development will be covered in more depth in the following chapter.

CHAPTER 6

ASSUMPTIONS UNDERPINNING THE PROGRAM

Teaching teachers is something a child has never thought of trying to do. (Wayne, interview, 31/08/2006)

This project was focused on the teachers involved in one particular approach to teacher professional development in ICT, a child-to-adult mentoring program and the benefits they saw in the program. During the literature review, an important aspect of the child-to-adult mentoring program that arose was the establishment of a list of assumptions on which to base the program. Briefly discussed in this chapter are the assumptions on which the development of the program was based and how these assumptions developed through the project to be more appropriate for a child-to-adult mentoring model.

6.1 ORIGINAL DIAGRAM

The original diagrammatic representation as seen in Figure 6.1 was established as a list of key assumptions that would underpin the development of a mentoring focused professional development program. It was then incorporated into a diagram to assist in the interpretation of the list. These factors were based on the items that arose in the literature as discussed in Chapter 2 (Clarke, 1994; DET, 2005; Knowles 1990; Loucks-Horsley, Stiles & Hewson, 1996; Rodriguez and Knuth, 2000; Yocam & Wilmore, 1994). All items seen as important in mentoring situations were collated from the literature. An underlying influence on the selecting and collating was the possibility of the items being useful in a child-to-adult mentoring model. Three specific groups emerged. Those that primarily related to the teacher, those that primarily related to the relationship between teacher and child and those items that would become relevant throughout the course of the mentoring. There was no focus on the child mentors alone as there was very little literature in this area and what was available focused on the relationship between the children with the teacher, rather than with the children alone.
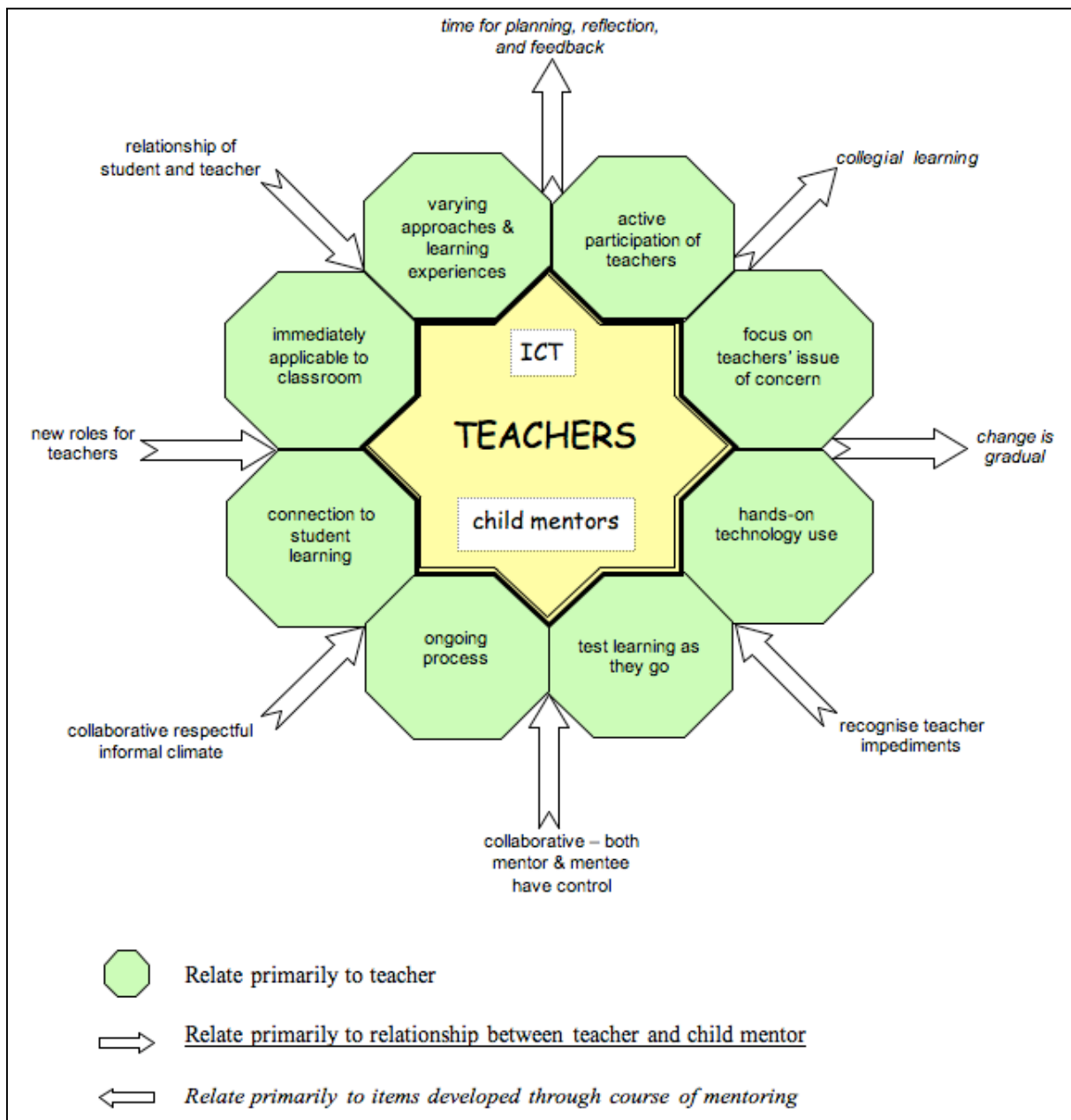
Figure 6.1. Original diagrammatic representation of the assumptions underpinning the development of a mentoring professional development program.

In this diagram, the yellow star at the centre directed us to the teachers who were joined as part of the main focus by their child mentors and ICT. Moving outward from the centre were key factors that needed consideration in relation to the teachers within the development of a mentoring program: focus on issue of teachers' concern, connection to student learning, immediate applicability to the classroom, active participation of teachers, hands-on technology, varying approaches and learning experiences, test learning as they go, and an ongoing process. These factors were taken into consideration when setting up the program to ensure that all possibilities for teacher development were considered. The final section of the diagram was made up of arrows pointing both in and out of the centre focus. The inward pointing arrows

contained factors that applied to the relationship between the mentor and mentee and the outward pointing arrows contained factors that were expected to become apparent throughout the project. This is a very complex diagram as it was an amalgam of many different assumptions, principles and strategies on adult, and specifically, teacher learning.

This original diagram was used as a focus for the development of the project and various items within it were discussed with the child mentors as part of their mentor training. The complexity of the original diagram made it difficult to use so although these items influenced the establishment of the program, an outcome of the study was the need to create a simpler model that was more succinct and focused. The original diagram was therefore refined in the light of the project findings in this child-to-adult mentoring model.

6.2 NEW DIAGRAM

Although the new diagram still had the same focus, it was simplified to four overarching categories that should underpin the development of any child-to-adult mentoring model for ICT professional development. These were surrounded by the obvious need for a collaborative relationship between mentor and mentee. The developed diagram of assumptions underpinning a child-to-teacher mentoring relationship with ICT is shown in Figure 6.2.
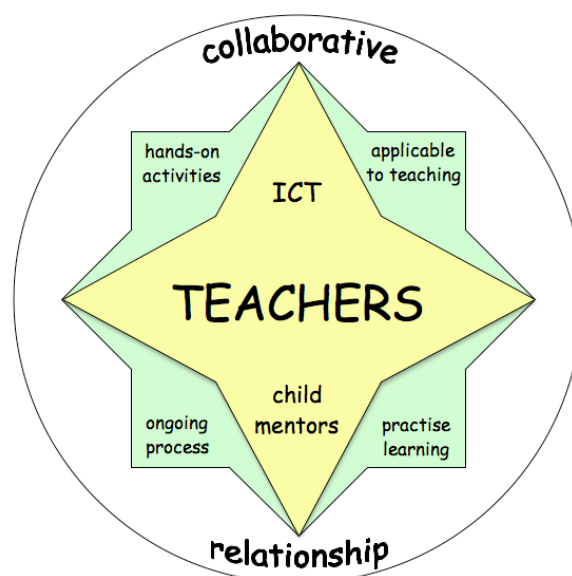
Figure 6.2. New diagram of assumptions underpinning a child-to-teacher mentoring model in ICT.

In the child-to-teacher mentoring model, many of the items that were prevalent in an adult-to-adult mentoring situation, as seen in the literature, did not emerge. This was particularly relevant here where the adults were teachers, and teachers who knew and were known by, though in differing levels of relationships, their child mentors. This changed the situation and allowed the previously complex diagram to be reduced to only the relevant items.

Some items were considered repetitive when considered in the child-to-adult mentoring model. For example in an adult-to-adult mentoring situation connection to student learning and immediate applicability to the classroom are unrelated, but for the child-to-adult mentoring situation when the mentee is a teacher, connection to student learning and applicability to the classroom are closely entwined. Also the fact that the teacher already had a developed relationship with the children, an understanding of the complexity of their learning and a teaching disposition meant that other items were just not relevant.

Within the original diagram there were eight octagons that represented key characteristics that needed consideration in relation to the teachers in the project. As the project progressed, it was realised that many of these characteristics were similar so they were combined for ease of use. As in the previous diagram, the new diagram has the teacher at the centre, with the child mentors and ICT in the same area, as the relationship could not function if these were not present. Surrounding these three key components are the four characteristics of professional development that have been most prominent in the needs of the mentee teachers. These will be explained further here as will the combination of the items to form these new facets of the diagram.

6.2.1 Hands-on activities

As the project progressed, it was obvious that the teachers wanted to be involved in their learning by actually participating in hands-on activities. Thus from the original diagram, active participation of teachers, and hands-on technology, were combined to create the new focus of *Hands-on Activities*.

The most prominent factor for the teachers in the project and the one item that was mentioned by all classroom teachers was the need for their learning to be hands-on.

The teachers in this project, like most of the children they teach prefer to learn in a practical fashion where they actually do the tasks that they are being taught. Teachers in the project reported that generally they received less hands-on teacher professional development than they desired. Without the practical hands-on activities it appeared the teachers would have acquired less from the project than they did.

6.2.2   Applicable to teaching

This new model for professional development was concerned with teachers. Teachers' main issues of concern were student learning and applicability to the classroom. These items in the original diagram were therefore combined to create the new focus of *Applicable to Teaching*.

Teachers are busy professionals and if they are to participate in any extra curricular professional development it must be applicable to their teaching and able to be applied quickly. This may be in the form of direct application to their students, or may be in a mode that assists them to prepare themselves or activities for their teaching. Teachers stated that they do not want to participate in activities that are "a waste of their time"!

6.2.3   Ongoing process

For all teachers, the one item that did not change from the original diagram was the need for the process to be ongoing. Those teachers who were anxious about the technology particularly needed the ongoing support of their mentors, but also those who were more confident enjoyed the ongoing discussion and co-learning they developed with their mentors. Although change is gradual for some, this is not true for all as Odette's case illustrated. The need for gradual change is seen as part of the ongoing relationship.

The ability to access the student mentors in this project between and after sessions was seen as a real benefit for many teachers. The value of a person or persons who can assist when something is forgotten, just to spark a reminder in the memories of busy teachers, was also seen as particularly important in this project. Although some teachers said they had taken their learning further than the project they also said they still discussed issues that arose with their mentors.

As the teachers were in close communication with the children they were able to raise any issues of concern immediately in the one-to-one situation whenever they wanted. This enabled the teachers to direct the sessions and incidental meetings, to their issues of concern by asking questions throughout and between the sessions.

6.2.4   Time to practise learning

The teachers made it clear that they needed to test their learning as they progressed through the program. This has been renamed as *Practise Learning* to clarify its meaning. It included *test learning as they go* from the teacher influences and *time for planning, reflection, and feedback,* which was part of the original influences that it was hoped would develop through the course of the research.

This was one item that was not particularly prevalent in the project and would be seen as the missing link for many teachers. Teachers talked about the need to practise their newly acquired skills regularly to consolidate them. Teachers therefore suggested that more time with mentors for practise of skills learned would have been beneficial.

6.2.5   Collaborative relationship

Apart from the knowledge, skills and confidence with ICT, the teachers were the older, wiser, members of the mentoring partnership. Although they did not outwardly look to have control of the sessions, this maturity did enable them to have quite an influence on the sessions and the development of the relationship, particularly via their questioning techniques. As they were able to have some control, many of the original items became redundant in this situation. The child mentors were very focused on the content of the sessions, but they also wanted to please the teachers, so although they were *in charge*, they could be manipulated if the teacher saw the need. Most other items in the original diagram, such as: varying approaches and learning experiences, collaborative-both mentor and mentee have control, collaborative/respectful informal climate, relationship of student and teacher, were combined to be included in the term *Collaborative Relationship*. This collaborative relationship was not only about the immediate collaboration but also involved aspects such as the new role for the teacher.

This final all-encompassing item, the collaborative relationship was easily established because all of the teachers in the project were happy to be working with the children. Teachers commented that it was very easy to work with children and all combinations of teachers and students were harmonious relationships.

Finally some items disappeared completely as they were not necessary in this situation. They included: collegial learning (the children were the colleagues in this relationship) recognise teacher impediments, (teacher impediments were catered for by the way children taught, eg slowly, step-by-step).

In the following and final chapter, the overall benefits of the program are discussed with recommendations for schools and the education system and implications for further research regarding ICT professional development, professional development in general, school leadership, teacher classroom practice in using children as mentors, and selection of child mentors.

CHAPTER 7

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

7.1   CHILD-TO-ADULT MENTORING IN ICT

In spite of hardware being disseminated throughout schools and governments making ICT a priority, the use of ICT in education has not thrived across the state of Victoria as might have been expected, and its potential impact has therefore been greatly reduced. Extensive professional development has been put into place. This has included sessions both external to and within schools in the form of lecture, workshop and ICT coordinator mentoring sessions. Overall the professional development appears not to have had the desired or expected impact in that only some of the current professional development options are really working for only some of the teachers.

This project provided an opportunity to explore an alternative approach to teacher professional learning that a pilot study had shown to be effective. Working with two primary schools in Melbourne Victoria, the researcher assisted in the professional development of a group of Grade 3/4 children who in turn mentored, in pairs or trios, the teachers in their school. The focus of the study was the use of digital cameras and related software to assist the teachers in the development of their confidence and skills with ICT. This in turn assisted in the integration of ICT into their classroom practice.

This study explored the benefits of using the confidence and skills of children in a Grade 3/4 class to assist their teachers in their professional development with ICT. It is well documented that children are the *computer generation* (Sandberg & Söderberg, 1997), *net generation* (Oblinger & Oblinger, 2005; Tapscott, 1998), etc in the world of ICT and that most are able to explore their digital world with ease. The issue was whether they could also impart these skills to their teachers and, if they could, what would be the value of these skills.

7.1.1　Theoretical basis

This research study was situated in the interpretative paradigm where the researcher attempted to interpret the benefits of student mentors in ICT through the eyes of the teacher mentees. The teachers' perceptions were related to an alternative professional development model that enlisted children in a Grade 3/4 class as mentors to teachers in their school. The child mentors were to assist the teachers in their professional development in the use of digital cameras and related software, for use in their teaching and their students' learning.

A list of assumptions underpinning the professional development model was collated from relevant literature on adult learning, teacher professional development and mentoring, and displayed diagrammatically (see Figure 2.2). A list of features underpinning a quality relationship in a mentoring model was also developed from the literature (see Figure 3.8). Both the assumptions and the features were used to design and analyse the professional development program. They were refined to much simpler terms, as the within-school child-to-adult mentoring model for professional development in ICT was seen to be less complex than a traditional adult-to-adult model. This related to the less complex social constraints between children and their teachers which had a limiting impact on the assumptions and features. Teachers in the project showed a great trust in the children and they were not as inhibited with them as they reported being in the adult-to-adult situation. This enabled many items such as *recognising teacher impediments* and the notion of *control* to be left out of the final child-to-adult mentoring model. The final assumptions reproduced here in Figure 7.1 describe the needs of the child-to-adult mentoring situation as seen in this research study.
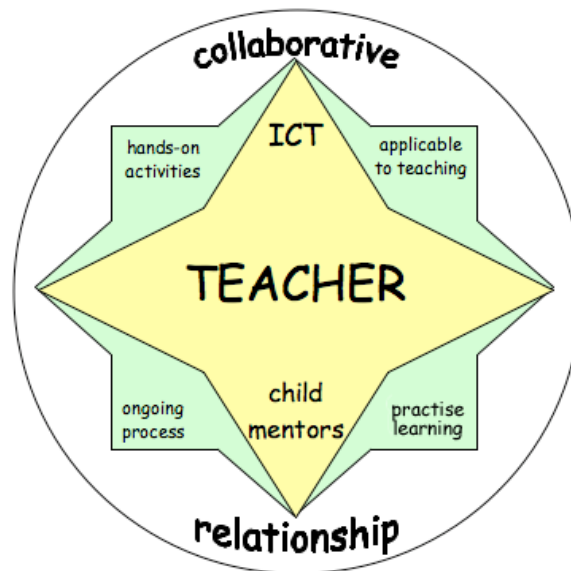
Figure 7.1. Assumptions underpinning a child-to-teacher mentoring relationship with ICT.

The key components of these assumptions underpinning the model of child-to-adult mentoring surround the teacher mentee, child mentors and the ICT they used. They describe the specific features that this research study suggests should be a part of any such professional development program:

1. a focus on hands-on activities for participants;
2. relevancy to the participants' current teaching;
3. time and support to practise and consolidate the learning; and
4. an ongoing learning process where student mentors are available to teachers to assist or extend their learning as required.

All of these key components are set in the context of the collaborative relationship that exists between teacher and child. These four key components, which were confirmed throughout the data collection and analysis, were discussed more fully in Chapter 6.

The features in Figure 7.2 describe the characteristics of the people and relationships within this study's child-to-adult mentoring program.

Mentor (CM=Child)	Mentee (TM=Teacher)	Relationship between mentor and mentee (RB=Relationship)
CM1. Personal characteristics	TM1. Self as a learner - specific	RB1. Good rapport
CM2. Learning environment	TM2. Approach to project	RB2. Shared experience
CM3. Chosen teaching style	TM3. Take control of mentoring session	RB3. Acknowledgement and celebration of achievements
CM4. Relationship between mentors	TM4. Learning style	RB4. Locus of control

Figure 7.2. Features underpinning a quality relationship in a child-to-adult mentoring program.

These features describe the characteristics seen in the participants of the child-to-adult mentoring program with specific reference to the child mentor, the teacher mentee, and the relationship between them. The full elaboration of each category and a discussion of their development can be found in Appendix 6.

As has been noted in Chapter 5, the scope of the original research question for the study proved to be too narrow. The data showed that the teachers recognised other values inherent in the program as well as those in the original question. While the original question was specific about the teachers' reported benefits with reference to their skills, confidence and classroom practice, as the study progressed, it became imperative to focus also on the teachers' recognition of other values inherent in the program. Hence the research question was modified as shown in Figure 7.3.

> What *benefits* of student mentors in ICT do teachers report?
>
> In particular what is the perceived effect of this approach on the teachers' skills, confidence and classroom practice with ICT and their recognition of other values inherent in the program.

Figure 7.3. Final research question.

This recognition of other values inherent in the program had a strong focus on the child mentors. These child mentors were referred to continually by the teachers and have consequently had a significant impact on the data and the implications for further research and practice.

In this final chapter, the overall benefits of the program will be explored with a particular focus on the implications that the program has for teacher professional development in ICT. Suggestions for options of future research and outlines of some limitations of the present study will also be noted.

7.2 BENEFITS

The research question (see Figure 7.3) focused on the benefits of student mentors in ICT as reported by teacher participants. In particular, it directed attention to the perceived effect of this approach on the teachers' skills and confidence with ICT, classroom practice with ICT, and also took into consideration the teachers' recognition of other values inherent in the program.

7.2.1 Overall insights as to the benefits of the program

A model for child-to-adult professional development in ICT was developed for the particular schools involved. This professional development model was underpinned by the theoretical basis for the program which was redefined in the assumptions and features underpinning the child-to-adult mentoring program in ICT.

As was expected after reviewing the literature on the use of technology in schools, the teachers who participated in the program showed a diverse range of skills and confidence with ICT both in their personal lives and their classroom practice.
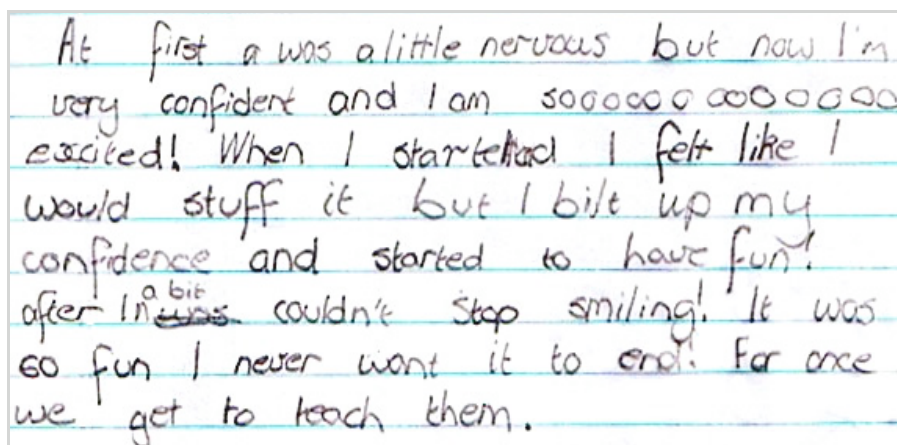
The reported perceptions of the teachers as to the benefits of the program were varied. These included first and foremost the overall success of the model. Specific aspects were the fact that the children's confidence and skills made them excellent for the role of mentors, the selection of digital cameras and related software was a good starting point, the teachers' gain of confidence and skills with digital cameras, the related software and use of the cameras and other ICT in classrooms, the availability of the mentoring program as ongoing due to the on-site method, and the teachers' perceptions of the appropriateness and impact in the use of the child mentors.

- Overall success of the mentoring model

For the two participating schools, the project progressed well with 22 teachers (15 of them classroom-based) and 40 child mentors involved. All participants reported that the project was successful, with the model for child-to-adult mentoring being seen as a very useful facet of teacher professional development in ICT. Both school principals were involved in the project and were pleased with the outcomes of the project for both the teachers and the child mentors.

- <u>Children well suited to the role of mentors</u>

The program could not have been successful without the children's confidence with and skills in the use of ICT. Their enthusiasm for the project stemmed from this and created an atmosphere in which all involved with the mentoring thought positively about the project. The children showed great excitement at being a part of this special ICT project, as Milly's journal comment of the 16th of August, 2006 shows (see Figure 7.4).

Figure 7.4. Milly's journal comment.

The coordinator at Mountaintop reported the great rivalry in one family where twins were in different classrooms so that one participated in the project and the other did not. The participating child was very excited to be in the chosen group (Elizabeth, personal communication, 10/07/2006). The children's enthusiasm for involvement with the ICT meant that they were eager to learn and pass on their new knowledge and skills to the teachers, and indeed other children in the school, and their families and friends outside of school. This also made teaching the child mentors relatively easy, as they were really keen to learn all they could about the digital cameras and related software. Hence they became ideal for the role of mentors to their teachers. The enthusiasm, though tinged with nervousness when going into the first sessions with the teachers, was clearly evident, as were the delighted looks on the children's faces when the teachers "learned something." The child mentors were pleased to be working with the technology, but even more pleased when they realised the teachers valued their input.

The children performed their role as mentors well. All teachers highly praised their mentors. Interestingly, some teachers commented with pleasure on the assignment of their mentors, pleased that they had "the good ones" (Teresa, interview,

06/09/2006), not realising the other teachers felt exactly the same. All children, no matter their level of academic ability, previous behavioural issues, age or gender, performed well in the role of mentor. Some obviously performed better than others, but by the end of the project, the children as a group were certainly seen as a valuable, but previously untapped resource within both schools.

- Teachers' changing perception of the role of children as mentors.

Some teachers began the project thinking they were doing the children a favour in assisting them to be mentors, but realised as the process proceeded that the children were actually imparting knowledge to them.

Most teachers had underestimated the amount and depth of the children's knowledge and skills, but were quick to realise the value of the children in this new role. Part of this was the use of Grade 3/4 children. The teachers were more familiar with the Grade 6 children having leadership roles, but had not thought of the younger children as being as capable and therefore valuable. This changed perception of the abilities of the children opened teachers' eyes to many possibilities to utilise the children's talents as mentors for both peers and adults.

- The appropriateness of Grade 3 and Grade 4 mentors

Some teachers were surprised initially at the choice of Grade 3 and Grade 4 children as mentors for adults. They were unsure as to whether the children were old enough to carry out this position, as Grade 6 children had previously been given roles of responsibility within the schools. By the conclusion of the program, teachers noted that the children were capable in the role and were pleased with their abilities.

Teachers also noted that as the children were in Grade 3 and Grade 4, they would be at the school for longer than the Grade 6 students who would be leaving the school to move to high school at the end of the year. This meant that the teachers would not be losing their resource, their mentors, at the end of the year, but that they would be staying on at the school to assist them in the future.

- <u>Teachers' gained skills and confidence with digital cameras, related software and the use of ICT in classrooms</u>

Some teachers were somewhat sceptical at first, worried that their time would be wasted, but at the completion of the project all teacher participants agreed the program had been worthwhile for them. They agreed that as well as gaining skills and confidence with the digital cameras and related softwares, they gained valuable ideas and confidence in the use of ICT in their classrooms. This ensured that almost all staff had used at least some component of ICT from the sessions in the preparation or teaching of their classes within a short time of the commencement of the project.

- <u>The on-going nature of the professional development</u>

The program was based on the idea that a focus teacher could return from a professional development session and impart their new knowledge and skills to the class of mentors, who would then pass them on to the other teachers in the school therefore enabling the focus teacher to be available for more pedagogically focused professional development. The mentoring model was enhanced by the fact that the teachers were able to call on their mentors in times of need. The mentors were in the school and unlike a teacher who would be responsible for children in a classroom, they were able to assist their mentee teachers at almost any time, given the flexible approach adopted and accepted by staff.

As was discussed in the literature review, the ability for professional development of any kind to be ongoing for participants is one key to its success. The ACOT study (Yocam & Wilmore, 1994), which looked at an alternative to traditional teacher professional development in ICT and is seen as the basis for research on in-school teacher professional learning in ICT, found that the teacher development approaches that had the most impact, amongst other things, provided ongoing support. All other studies cited in the literature review listed the need for ongoing support in their various lists of features of effective models of professional learning (Clarke, 1994; DET, 2005; Loucks-Horsley et al., 1998).

- <u>The appropriateness of digital cameras for this program</u>

The choice of the digital cameras as a starting point for teacher professional development in ICT was anticipated as a good one and indeed proved to be so. Digital cameras were an adaptation of something all teachers had used before, a camera, and it led them reasonably painlessly to the ICT world of the digital camera and related software. As noted in the literature review, the role of the learner's past experience cannot be underestimated, so to select an item that is already familiar to the teachers, even if only partially, allowed them to more quickly adapt to the new technology (Burns, 2002; Knowles, 1990; Knox, 1987; Lindeman, 1926). This meant that there was some familiarity initially, unlike the introduction of a new piece of software where the new user has no idea of its uses or value.

The digital cameras were seen as useful in a range of curriculum areas. This made the choice pertinent to all staff and allowed the technology to be more easily integrated into classroom practice. This meant that, as recommended by Malouf (2003), the teachers had a specified purpose for their learning and an immediate usefulness (Fogarty & Pete, 2004).

The teachers reported this range of overall benefits, the majority of which were also supported by comments from others involved (parents and children). The teachers went further then to more specific benefits focused on themselves, their teaching and other unexpected outcomes of the project. These will be discussed in the next section.

7.2.2 Reported benefits for teachers

Teachers reported a broad range of benefits for themselves. They learned a range of skills with ICT and this in turn gave them greater confidence to use ICT both in their personal lives and in their teaching. Both consideration of the use of ICT in preparation for lessons and also the use of ICT within lessons were more prominent in most classrooms after the project and the amount of child-to-child and child-to-adult mentoring also increased in many classrooms. Teachers gained knowledge about their student mentors that opened their eyes to possibilities for their own students. Finally, teachers reported a deeper understanding of their own preferred learning style, which in turn assisted them to deal with the varied learning styles in

their classrooms. In essence they learned about their personal learning styles and their students' learning styles, through their own learning.

- Skills and confidence with ICT

As is detailed in Chapter 5, all teachers reported improvement in skills with the specific ICT, and all except three (who had commenced the project with high stated confidence) reported improvement in confidence with ICT. As this was the initial focus of the project, it was a pleasing result, but with a change in confidence and skills, a change in classroom practice was also expected.

- Changes in classroom practice with ICT

Teachers reported an increase in use of ICT in their classrooms. They attributed this to three major factors: increase in confidence; increase in skills; and the fact that they had been spurred into action by the sessions with the children. The teachers increased the use of ICT for planning, preparation and in the actual practice of their teaching. They also made ICT more freely available in their classrooms, which in turn encouraged the children to use it in their learning.

- Appreciation of the value of mentoring

Teachers commented on the value of mentoring as a concept. They thought that it could be used more often in their own learning, as well as for more specific behaviours in their classrooms. This translated to the teachers maintaining the assistance of the child mentors in their learning, the use of child mentors to assist teachers in teaching a class, child mentors mentoring parent helpers in the classrooms, and child mentors assisting their peers within and across grade levels.

- Knowledge of students

The most frequently reported benefit for many teachers was what they learned about the students. The fact that the Grade 3/4 children were capable of mentoring adults confidently and efficiently, opened the teachers' eyes to many other possibilities for the children in their school and specifically their classrooms. They realised that the children were more capable than they had previously thought and that they may have in fact been holding some children back by not allowing them to realise their

potential. As the principal of Mountaintop said in his interview, "we don't access our children as a resource as we should. And that goes across every curriculum area. … Hopefully it has opened up the staff's eyes, it has opened up mine" (13/09/2006).

- Learning styles

All classroom teachers within the project made comment on the fact that they learned better when they were exposed to a hands-on or active learning style. Although some of them stated that they knew this prior to the project, others realised it through their learning. They also commented on the fact that the children they taught might also prefer a hands-on style of learning. In essence, they learned about their personal learning styles, through their own learning, and in turn considered what this implied about the learning styles of the children they taught.

The teachers learned many things about themselves throughout the project, but were also very aware of the children in the project and the benefits it had for them. I now reflect on the teacher perceived benefits for the student mentors.

7.2.3 Reported benefits for student mentors

Although this research was not focused on the student mentors, it was noted in the literature that "mentoring involves the development of yourself as well as others" (O'Mahony & Matthews, 2005, p. 22). The teachers did report benefits from the program that were not related directly to their personal skills, confidence and classroom practice. The most prevalent of these was the list of benefits the teachers reported for the child mentors involved in the project. They felt that one of the most positive results of the project was the development of the children through the mentoring role they played.

- Enjoyment

The children, surprising to many, actually loved the whole mentoring program. They enjoyed the sessions in which they were given the responsibility of learning about the digital cameras and related software, and the fact that they were trusted with this equipment that was normally only used by teachers or special Grade 6 children. Although nervous at first, they enjoyed the time mentoring the teachers. Originally the child mentors found it fun to learn and impart the knowledge, but they also soon

realised that they were respected by the teachers, who praised them for their knowledge and skills.

The children so enjoyed the learning and consequent mentoring that many took their new knowledge and mentoring skills home with them where they reported mentoring siblings, parents, grandparents and friends. This too was an unexpected benefit.

- Confidence

The literature review pointed to the fact that children were confident with technology given the fact that they have grown up with it as part of their lives. Where adults would use the term *digital camera*, the children in our care are more likely to use the term *camera*, as digital is taken for granted by them due to the fact that few have seen earlier products. The two similar studies that reported on what were referred to as child-to-adult mentoring programs found this confidence increased for their child mentors throughout their programs (Bolstad & Gilbert, 2006; Harper, Martinez, Hardy & Conor, 2005). This was certainly confirmed for many of the children involved in the project (that they were confident with the idea of using ICT) though not surprisingly the idea of teaching a teacher did not fill many of them with confidence. The child mentors were initially tentative in their sessions. That very quickly passed as they realised, as the teachers did, that they had something to offer. Teachers found the children very confident both in their knowledge and in their confidence to teach a teacher.

- Self esteem

Unlike the increase in confidence, an increase in self esteem for the child mentors was not reported in the two similar studies. This seems to be something particular to this study. This increase in self esteem for the child mentors was discussed as obvious for most child mentors as comments from teachers and parents attest. It was particularly relevant for two particular boys, one at each school, who would never have been selected for a responsible role within the school due to their struggle with academic work and being generally seen as students who needed help with their own learning. Hence neither would have been expected to assist others with cognitive tasks. Both these boys shone as mentors. The change the teachers, principals and parents saw in their self-esteem was the topic of many discussions in

both staffrooms. This points to a possibility of a key benefit for the model; namely that *all* children may achieve success in this model if they are given the opportunity to participate.

- Knowledge

Some children had a small amount of previous knowledge with digital cameras, but the majority of their knowledge was gained in their preparation for mentoring sessions. They were very diligent when learning about the digital cameras and related software, and were eager to share the information with the teachers. As Peter, the Mountainview principal said in his interview, "when teaching you have got to have a reason to learn. What better reason [for the children] to learn a skill than to move on to teaching a staff member" (Peter, interview, 13/09/2006). Although some teachers were unsure in the beginning whether the children would have any knowledge worth sharing, they soon realised that the children had a wealth of knowledge they were happy to share. As Rebecca stated in her interview, "I think when a child, or when someone teaches you something it confirms it in their own mind. Teaching someone they have to know what they are teaching" (06/12/2006). In other words, to be able to teach something you must know it well and these children had certainly gained knowledge in the workings and uses of digital cameras and related software.

- Relationship and communication skills

As stated in the introduction, this was an unusual relationship for both teacher and child, but it was certainly a valuable and increasingly valued one. The children gained valuable time with an adult that they admired. They were able to speak with that adult in a way they had previously felt unable to do. They had the adult's full attention and were able to share and actually assist the teacher in their care. For children to do this with adults they know well, such as family and close friends may be a normal situation, but for them to do this with a teacher from whom they had always had a professional distance was unusual. The children handled their time with the teachers well and communicated clearly and with care, without being condescending. Teachers were pleased to see the children's communication skills develop throughout the project. It was obvious to all that the children were able to

communicate at the required level with the teachers and they developed lasting relationships that were beneficial for all.

- Responsibility

The child mentors gained a huge boost of responsibility in both their eyes and the eyes of the teachers. It was often mentioned during the project that the children relished the responsibility normally offered to Grade 6 students. This was noted by both teachers and parents, as they all discussed an increase in the sense of responsibility exhibited by the children.

So how were all of these positive benefits able to occur in this small project of child-to-adult mentoring? The teachers commented on, this without prompting, but were also asked directly about how or why they thought these benefits occurred. Their responses, which are summarised in the next section, are illuminating.

7.2.4 Aspects of the program that contributed to the positive responses from teachers

Teachers reported a range of aspects of the program that they felt gave rise to their positive responses. They were very positive about the format of the sessions, the availability and demeanour of the children, and the children's abilities to pass on the information they had in a clear and concise way, while not rushing or distressing the teachers.

- Relaxed atmosphere of structured sessions

The child mentor directed sessions proved very popular with the teachers and children and allowed relationships to develop between the teachers and their child mentors. The relaxed atmosphere provided by the children mirrored Fogarty and Pete's (2004) description of an adult learning environment that is a collaborative, respectful, mutual and informal climate. The climate created by the child mentors was all of these and so allowed productive time for the children to pass on the information they had learned with the digital cameras and related software.

The following section briefly describes how the other values the teachers saw in the preparation and presentation of the mentoring sessions assisted in the teachers' learning.

- Short sessions

Teachers felt that the sessions of between 20 and 30 minutes were just right for their learning needs. They did not have time to focus for longer and they also felt that they received enough information in that time period to enable them to assimilate and practise what was learned prior to any further sessions. One particular teacher did feel overloaded in her sessions and suggested she would have liked more supervised revision time between sessions to consolidate her learning. This teacher did utilise her mentors after the program finished to assist her further in practice and assimilation of her learning into her classroom practice. This brings to mind the ACOT finding that positive impact teacher professional development programs offer opportunities to experiment and reflect. The new issue here is that the time for reflection will differ substantially with each teacher.

- Regular support and follow-up available in school

As was suggested in the Yocam and Wilmore's (1994) ACOT research, ongoing support is important in any teacher professional development model. The fact that the children were in the same school as the teachers, and that the classroom teachers of the mentors were happy to allow their students to assist teachers whenever the teachers needed, meant that the teachers had regular and available on-the-spot support. They did not have to make a phone call or send an email to someone and wait for a reply; they had their mentors available whenever they needed them. This also enabled the use of the child mentors for follow up sessions, and some teachers took advantage of this option.

- The hands-on nature of teacher professional development

As was noted by Rodriguez and Knuth (2000), hands-on technology use is an essential component of professional development for technology in schools. The teachers in this project reported enjoying the hands-on aspect of the project and felt this was a big difference between these sessions and the *sit and listen* type of

professional development sessions they had previously attended. The teachers reported that the fact that these sessions were personal and hands-on allowed them to learn more effectively.

- <u>Individually tailored sessions</u>

Teachers were also happy to have the individual attention that the child-to-adult mentoring sessions allowed. This meant that the teachers could direct the sessions with questions when they saw a need and also felt able to ask questions as often as necessary so they could understand fully and practise the content and procedures. The personal aspect of being able to feel relaxed, make mistakes and fix it together made it much more effective for these teachers.

As well as the sessions suiting the teachers' timeframes and busy schedules, the children had an impact on the teachers' reported benefits.

- <u>Children as mentors provide a non-threatening environment</u>

The children, through being part of the digital generation, had the confidence and skills with ICT that most of the teachers could only imagine. Many aspects of the program related to the session format and positioning may have also been possible in a one-to-one adult mentoring situation. Other teachers or professional development providers had assisted the teachers in the past, but most of these participating teachers reported that they had very rarely felt comfortable in these professional development situations. The difference here was that the teachers reported they felt comfortable to behave in a different way at the child-to-adult mentoring situations and this assisted their learning. As noted by Scott (1985), adult learners can feel threatened about the possibility of looking a fool or feeling a failure. These teachers did feel that an all knowing adult was much more threatening to their self esteem than the non-threatening children. Some also doubted the motives of the teachers but noted the innocence of the children. Overall teachers reported the children as non-judgemental and non-threatening.

- <u>Child mentors' approach was thorough and not rushed</u>

As well as putting the teachers at ease, they also reported that the actual method of teaching used by the children was very thorough. It was noted that the children did not waste time in the sessions. This kept the teachers focused on the session and allowed them to gain full benefit from it. The teachers also noted the children were very thorough in what they taught. This assisted the teachers to take in all of the information on the digital camera and related software, and not just use the parts that they could pick up in a more rushed session.

Those teachers who had mentors who were generally thought of as academically weaker students or those who were not always able to focus in classroom situations were surprised that these children were actually excellent mentors. They suggested that this was due to the fact that the children broke the instructions into small hands-on steps so that they were easy to follow, assimilate and therefore learn. The children also presented their information at a slower pace than the teachers felt they would normally be expected to learn and the teachers felt this too was beneficial. They did not feel rushed.

This is something that was not mentioned at all in the literature, and so it raises an issue for professional development providers everywhere. Teachers want to thoroughly understand what they are being taught. This will take time.

- <u>Child mentors were capable</u>

As was seen with the GenYes (Harper et al., 2005) and Tech Angels (Bolstad & Gilbert, 2006; Tech-Angels, 2007) research, children are capable of assisting teachers. The teachers in this project have confirmed that children as young as eight years old can make capable mentors. Most importantly, as well as having an enthusiastic, friendly manner at all times the children were seen as very capable of transmitting their knowledge and skills to the teachers. They were knowledgeable on the topics covered and were able to assist with questions that were not directly related to the topics they were required to teach.

- <u>Teachers wanted to help the child mentors</u>

Overall, the teachers reported that the children created an environment that was conducive to learning. It was interesting to also see in the data the prevalence of teachers who saw this project as a way of assisting children in the development of a variety of skills. The teachers felt they were obliged to assist and encourage the children in the project and although they received benefit from the project, they were all very pleased to see it was beneficial for the children also.

This research was seen as successful in the schools it encompassed. Due to the limitations of using only one school in the pilot study and two schools in the actual research project; using specifically aged children; and focusing on specific ICT components, the results will not necessarily be replicable to other schools, teachers or components of ICT. These results are valid only in the research setting described here, but they do signal possibilities to be explored in other settings. For this research to be of value in a broader context it would need to be a basis for further investigations in the area of professional development of teachers in the area of ICT, but also in other areas as well. The next section suggests possible avenues for further research.

7.3 IMPLICATIONS FOR FURTHER RESEARCH INCLUDING LIMITATIONS OF THE PRESENT STUDY

This research focused on a different relationship between teacher and child which had not been explored in previous literature. Although two studies showed a similar focus of students assisting teachers with ICT, neither had the specific focus of Grade 3/4 students mentoring teachers in their professional development to develop skills and confidence with ICT. In these two research schools and the pilot study school, this mentoring relationship was seen as useful to the teachers and children involved. Initially, there were some who were concerned that this type of mentoring relationship would not be successful due to the teachers' reticence to expose their weaknesses to the children. Although the teachers reported this feeling of vulnerability in adult-to-adult professional development, in this child-to-teacher mentoring study they reported the opposite. Teachers were comfortable with the students mentoring them and teachers reported not being concerned about the children seeing their limitations in

the area of ICT because "being an older person you do have to admit you don't know a lot about computers" (Rebecca, interview, 06/12/2006).

If, as this study suggests, this method of ICT professional development is one in which teachers' feel comfortable, and one that has positive effects on their confidence, skills and classroom practice with ICT, it is certainly worthy of further research. Two broad areas are pertinent here:
- the applicability of this research to other audiences in education and/or other curriculum areas; and
- the further development of this child-to-adult mentoring ICT professional development model.

7.3.1 Applicability to other audiences and/or curriculum areas

A professional development model may be of value to a small group of schools or teachers as in this case, but for it to be implemented more widely, it needs to show applicability across a broader range of schools and/or curriculum areas. The following areas are therefore suggested for further research.

- <u>Other audiences</u>

As this program has proved successful in the specific settings outlined earlier, it could be expanded to attain its applicability across a more extensive range of school situations. As Mountaintop had 283 students and Hillside 136 students at the time of the research study, they certainly were not in exactly the same demographic. There are many other primary schools both larger and smaller that would have different issues to the two studied.

This program may also be applicable to secondary schools. Some colleagues have commented that this project would not work with secondary teachers, yet mentoring programs involving students in the USA (Harper et al., 2005) and New Zealand (Tech-Angels, 2007) have shown that teachers are open to student assistance with ICT. Further research needs to be undertaken in secondary schools in Australia to ascertain if secondary school teachers are willing to be mentored by their students.

- Other curriculum areas

The area of ICT is different from most other curriculum areas in schools as it is recognised that many students actually have more knowledge, skills and confidence in this area than most teachers (Cookson, 2004; Irvine, 2004; Oblinger & Oblinger, 2005; Prensky, 2001; Sandberg & Söderberg, 1997; Tapscott, 1998). This is not a cause for concern in schools, but seen as inevitable due to the students' immersion in ICT from a very young age. Teachers are therefore more willing to be assisted by the children as they recognise that the children's ICT skills are better and are happy to accept and learn from the children who have grown up in a digital world. Although this is a strong component in the ICT area, it cannot necessarily be applied to other areas of the curriculum, which do not have the same contributing factors as ICT.

The children's experience and confidence from years of playful immersion in ICT were major contributors to the success of this mentoring program. This experience and confidence may for some children occur in other areas, but further research is certainly needed to show whether this method of children mentoring teachers would be applicable in other curriculum areas.

- Other ICT hardware, software or peripherals

This project considered only the use of digital cameras and related software. The pilot study considered the use of one piece of software, *Inspiration*. It is therefore a limitation of this study that more areas of ICT were not explored. Further research across a range of ICT hardware, software and peripherals is highly recommended to consolidate this model as a valuable professional development model for teachers in the area of ICT.

7.3.2   Further development of this professional development model

Applicability to other audiences and areas is important research to consider, but so is further development of this actual model. This research showed strong indications that the model of professional development was valuable to teachers in the schools described, but whether it is applicable to all teachers or more applicable to specific groups of teachers rather than others needs further exploration. The teachers in the project reported that the child mentors benefited from the model of professional

development, but no data were specifically collected with this aspect in mind. The actual benefits to the child mentors and the method of selecting them, need further exploration to show how they benefit directly and to ensure that no child is overlooked in a role they may have the qualities in which to excel. In this model, the role of the ICT coordinator varied between the two schools. This role was seen as pivotal to the success of the program and is certainly deserving of further research.

- <u>Impact of the model on the child mentors</u>

Although the professional learning of the teachers was the main focus of the research, the teachers themselves pointed to the children in the project as also being affected by the model of professional development. Further research on the impact on the child mentors of the model would be of benefit.

- <u>Selecting mentors</u>

The selection of child mentors in this project was made with no reference to the skills or knowledge in ICT of the children. This meant that a wide variety of ICT competencies and experience was exhibited in the children who participated. Further research is recommended on the specific characteristics that are seen in quality child mentors to assist teachers in their selection. As stated in this thesis, some of the best mentors in the project were those not expected to excel. In some mentoring programs seen in schools where only two mentors are chosen per class, the best mentors may potentially have been overlooked.

It was expected by some teachers that Grade 3 and Grade 4 children might be too young for the responsibility and expectations of this project. Further research is required into the age of the mentors and in particular the expectations of children of certain ages. It is possible that children younger than eight years of age could be of value as mentors, but research is needed to confirm that possibility.

Age is only one option that could influence the quality of the mentor. The students' skills, interest and personality could all have an influence on their suitability for a mentoring role to teachers. Further research, in which a very wide range of characteristics of the child mentors is included, is certainly needed to investigate these possible options.

- <u>Teacher characteristics</u>

This study, although including others, has specifically focused on the classroom teachers. At the analysis stage, years of teaching experience, confidence and experience with ICT were all considered, but as data were not collected on age of participants, the age of the teachers was not considered. This is certainly an area worthy of further research. It is noted here that the oldest participant in the research project increased six points on the 0-10 scale in confidence from pre- to post-surveys against an average increase of 1.8. This was obviously the biggest confidence boost for the research project.

As discussed in Chapter 5, the improvement in teacher confidence throughout the project did seem to be influenced by teachers' years of experience. All teachers at Mountaintop with 15 years or less teaching experience started and finished with higher confidence ratings than those with greater than 15 years of experience. This may point to a conclusion that those teachers with 15 years or less teaching experience gained more confidence throughout the project than those with 15 years or more experience, but actually they gained less. Their gain in confidence rating averaged 1.8 where as the teachers with greater than 15 years of experience gained an average of 4. It could therefore be claimed that those teachers who had greater than 15 years of experience had a greater increase in confidence, but did it just mean they had more to gain? Having a higher rating at the start does give less room for upward movement. There is a need for further research in this area.

It is therefore possible that this model of teacher professional development would be more valuable to the confidence of the older teacher who has had little experience with ICT in their general lives, but also for the younger teacher who is ICT aware and will be able to integrate more quickly what is learned into their daily use of ICT. Although we can allude to these ideas, without further research we cannot assume them.

Adaptations of the program to these age or skill groups, is also an area for further research. We saw with Odette and Moira that they took very different things from the professional development they received from their mentors. Moira felt the need for ongoing support after the completion of the project whereas Odette, though keeping in touch with her mentors and using them when needed, took her learning further on

her own. The mentors were a support for one and a springboard for the other. If this method of professional development is to be ongoing in schools, the program needs to be able to adapt to the teachers it serves. Further research therefore on the medium- to long-term impact of the program would be valuable.

- Coordinator role

A very important role in this model is that of the coordinator. This person is entrusted with the professional development of the child mentors in the program. This is critical to the success of the program as the coordinator will be responsible for liaison with the staff in deciding on the staff professional development necessary. They will be a focus for the student mentors for their professional development and a general resource for the students in their mentoring role.

The coordinator would need confidence and skills in the area of ICT, and would be expected to attend regular ICT professional development, enabling them to keep current both with developing technologies and related pedagogical approaches. The technological knowledge and skills acquired at the professional development would then be passed on to other staff via the child mentoring program, thus freeing the ICT coordinator to focus on the working with staff to develop the pedagogical aspects of ICT in the classroom. Further research is needed to define the full range of characteristics of a coordinator and their specific role in this unique coordinating position.

7.4 IMPLICATIONS FOR PRACTICE

The program of professional development described here is one that could be considered by all schools and systems as a low cost alternative or complementary practice to current professional development of staff in the area of ICT skills and confidence. It was based in what is regarded as high quality professional development practice as described in the literature review. It used a model of professional development where the whole school could participate at the site using only on site personnel. It encouraged ongoing support through the ability to call on students to assist the teachers when the need arose, and in having the children continue to be available to the teacher mentees after the completion of the project.

This program has also contributed to the rejuvenated and ongoing use of the ICT facilities in the schools, by utilising the children's expertise and confidence, gathered from gaming and computer experience, and nurtured them with further educationally useful skills and knowledge to share with others. These children therefore became an ongoing resource in their schools and contributed to the ongoing use of hardware and software throughout the schools.

The evidence from the teachers of the two schools that participated in this research and the pilot study school indicated that this approach, of using students as mentors for teachers in their learning of ICT knowledge and skills and its application to their classrooms, is highly effective. There are a number of factors that contributed to the success of this project as described in this document but there are also many implications for practice that can be derived from it.

The student participants in this project have provided compelling evidence that all students are a rich untapped resource, specifically when it comes to sharing of skills and knowledge in ICT in schools. Throughout the project many events occurred which spoke to the current practice in schools and how this model of child-to-adult mentoring professional development could support teachers in their professional learning in ICT. As well as ICT specific professional development, the use of child mentors in this project gave some insight into how practices in general professional development could also be improved. This next section will explain these implications for ICT and general professional development.

7.4.1 Adoption of this model for professional development in ICT

As teachers reported in this project, current professional development in the area of ICT does not always cater for some specific attributes of teachers' learning styles. Teachers reported knowing that they learned best when they were given the opportunity to be hands-on learners and that any professional development that offered anything but hands-on activities was not properly fulfilling their needs. Teachers spend a considerable amount of time focusing on the learning needs and styles of their students, but claimed that the same courtesy was not given to them when they are expected to learn. Professional development models in ICT need to incorporate the use by participants of the technologies that the presenters generally only talk about or show.

ICT coordinators should be permitted to focus on the pedagogical side of professional development instead of skills training. If child mentor programs were run in schools, the coordinator could spend an hour a week up-skilling the mentors and then focus on the pedagogical needs of staff. This model frees coordinators and gives them extra resources (the child mentors) at their fingertips to cover skills training. The child mentors would assist the staff in their attainment of required skills and confidence. The child mentors could of course not solve every issue, but this option would markedly change the amount of professional development the ICT coordinators would be expected to lead, thereby freeing them for the important pedagogical issues faced by teachers. As the principal at Mountaintop said in his interview: "It gets back to what you said before, do you need the IT specialist teacher looking after every child in the school? Or does an IT specialist teacher train mentors to take a greater role influencing outcomes and obviously change?" (Peter, 13/092006).

The need for on the spot learning and assistance would also be filled with the child mentors available in the school every day. Although an ICT coordinator, who is also a teacher, would have many commitments throughout the day that could not be interrupted, a child mentor would be more available as they could be released from most classroom activities for 5-10 minutes at a time when required for on the spot assistance as well as any pre-planned sessions. As was discovered by Jones and Vincent (2006) when they were working with teachers in the use of interactive whiteboards, "teachers with less confidence and experience with ICT preferred instead more sustained and individual guidance on a 'need to-know' basis or as part of more structured continuing support, such as where experienced users work alongside novices" (p. 2). This is exactly how Moira (Chapter 4) utilised her mentors, as experienced users for on-going support throughout the year.

7.4.2 Teacher professional development generally

Presenters of professional development, and the people who coordinate and fund professional development, would do well to consider the comments regarding adult professional development. Teachers, whether presenters feel it or not, are anxious about the expectations of presenters and how they view the participants in professional development sessions. Presenters therefore need to spend more time

allaying the fears of the participants. They also need to remember not to include too much in a session, as this can leave the participants feeling rushed and inadequate. Teachers need to feel relaxed and have time to repeat things to feel they have consolidated their learning. Providing greater information on expected participant levels of understanding for particular sessions would also assist in having beginners at beginners' sessions, therefore enabling participants to know that others in their group are feeling as they do.

Teachers reported throughout the project that they did not want to be rushed, and that they appreciated thorough explanations. They felt the children who mentored them broke down the information to manageable pieces so that the teachers could understand processes thoroughly. They felt adults presumed they had skills they didn't have and so left them with gaps in their knowledge. These issues also need to be addressed.

We must also remember that the presenters cannot take all of the blame for misapprehensions within professional development sessions, as the participants are sometimes at fault. Adult participants do not want to show their weaknesses to their peers, so will often bluff their way through sessions and allow the presenter to think they are coping when they are not.

In this project, teachers wanted to be active in their learning. They wanted to take their time and learn properly. They did not enjoy or feel they learned as well when they were only listening. Like the children they teach, the teachers preferred hands-on activities and felt these were more valuable to enhance and consolidate their learning. All teachers in this project spoke about the value of hands-on professional development. They reported that they did not like or gain as much value from professional development that was presented with no hands-on component.

Teachers also reported that less formal situations put them at ease. They wanted to be encouraged to ask questions and not to feel inadequate if they did not understand. They used words like "threatened" and "looked down on" to describe how they felt in some professional development with adults. This is obviously not conducive to learning. Teachers want to feel at ease so their learning can be as valuable as possible.

7.5 CONCLUSION

This child-to-adult mentoring professional development program for teachers was developed in response to a perceived lack of integration of ICT in schools compared with the financial contribution across many years. Previous professional development models were seen as inadequate for today's teachers so this model was piloted and then used in this project to ascertain what, if any, benefits of student mentors in ICT participating teachers reported. Particular reference was given to the perceived effect of this approach on the teachers' skills and confidence with ICT, their classroom practice with ICT, and their recognition of other values inherent in the program.

All involved in the project, not just the teachers, but also principals, children and parents, reported positive benefits. Benefits included those related to the teachers' confidence, skills and classroom practice, but went well beyond those expected outcomes to include further benefits for teachers, as well as benefits for the child mentors and the school as a whole.

It is anticipated that further research will be done in this area of child-to-adult mentoring to elaborate on the positive findings of this research, to further inform the model and its applicability across school levels and curriculum areas. It is also anticipated that further research will assist to further define the roles of coordinator, mentor and mentee to assist in creating prime conditions for this program of child-to-adult mentoring to thrive.

The implications for practice in the area of teacher professional development in ICT highlight the fact that teachers still need the ICT coordinator's expertise in the pedagogical facets of teaching with ICT. It also pinpoints the need for mentors with time and patience to assist teachers in their skills, confidence and classroom practice. This is where the ICT-aware children are the previously untapped resource that can assist coordinators in the professional development of the skills and confidence of teachers in the school, thus allowing coordinators time to assist with the pedagogical needs of teachers.

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APPENDICES

Appendix 1: Teacher survey

Appendix 2: Student survey

Appendix 3: One year later survey

Appendix 4: Interview guide

Appendix 5: Observation Schedule

Appendix 6: Characteristics and features

Appendix 7: Teacher information letter

Appendix 8: Parent information letter

Appendix 9: Teacher consent forms

Appendix 10: Parent consent forms

Appendix 11: Ethics approval

Appendix 12: Gronn, D. (2007) *Changing Teacher-Student Relationships through ICT: Student Mentors in Australia. Paper presented at NECC2007, Atlanta, Georgia.* http://center.uoregon.edu/ISTE/uploads/NECC2007/ KEY_40989412/Gronn_NECC07_RP.pdf

Appendix 13: Gronn, D. (2007). Benefits of children as mentors to teachers in Australia: ICT, teachers & children. In D. Benzie & M. Iding (Eds.). IFIP-*WG 3.1 & 3.5 Joint Working Conference CD proceedings.* Boston: College of Computer and Information Science Northeastern University.

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Appendix 15: Gronn, D. (2005). Children mentoring teachers in ICT. Does it work? WCCE2005 8th IFIP World Conference on Computers in Education. Cape Town, South Africa.

Teachers Mentored by Students in Using Information and Communication Technologies (2006)

This survey is part of my doctoral research aiming to explore a model of teacher professional development where students mentor teachers in the use of information and communication technologies.

The survey is divided into seven parts. There are no correct or incorrect answers to the questions. I am only interested in your personal opinion. Your answers will be kept confidential.

Part 1: About You

Answer each of the following questions by circling an appropriate response or filling in the spaces:

1.	Name	
2.	School Name	
3.	Gender	Female / Male
4.	Grade level you are teaching this year	Circle: P 1 2 3 4 5 6
5.	Other grade levels you have taught	Circle: P 1 2 3 4 5 6
6.	Other teaching experience	
7.	Responsibilities you currently have at your school (e.g. assistant principal, curriculum coordinator, subject coordinator, class teacher, etc):	
8.	Including this year, how many years have you been teaching?	
9.	Including this year, how many years have you been teaching in your present school?	

Part 2: Computers and You – Background

10.	How would you describe the level of computer education you experienced as part of your initial your teacher training?	**Non-existent** → **Excellent** 0 1 2 3 4 5
11.	Since your initial teacher training, have you taken any courses or professional development (in-house or external) in using computers in education?	**Yes/ No** If **Yes**, please describe:
12.	Do you feel that you need some/further professional development in using computers in education?	**Yes / No** Please elaborate:

Part 3: Computers and You - Attitudes and Confidence

13.	Rate your <u>confidence</u> with the computer.	Low → High 1..2..3..4..5..6..7..8..9..10	Comment:
14.	Rate your willingness to have-a-go at new computing applications.	Low → High 1..2..3..4..5..6..7..8..9..10	Comment:
15.	Including this year, how many years have you used computers in teaching?		
16.	When Information and Communication Technologies (ICT) are mentioned how do you feel?		
17.	When teachers talk about using computers in their classrooms how do you feel?		
18.	When you have to use a computer for an administrative need how do you feel?		
19.	Who do you go to for help with computers?		

Part 4: Computers and You - Skills

How would you rate your level of ability with the following computer applications and tasks:

	Software type or name equivalent	low	high
20.	Your overall skill with computers	never used	1..2..3..4..5..6..7..8..9..10
21.	MS Word	never used	1..2..3..4..5..6..7..8..9..10
22.	MS Excel	never used	1..2..3..4..5..6..7..8..9..10
23.	MS PowerPoint	never used	1..2..3..4..5..6..7..8..9..10
24.	MS FrontPage	never used	1..2..3..4..5..6..7..8..9..10
25.	KidPix	never used	1..2..3..4..5..6..7..8..9..10
26.	Inspiration/Kidspiration	never used	1..2..3..4..5..6..7..8..9..10
27.	MicroWorlds	never used	1..2..3..4..5..6..7..8..9..10
28.	HyperStudio	never used	1..2..3..4..5..6..7..8..9..10
29.	Kahootz	never used	1..2..3..4..5..6..7..8..9..10
30.	Searching the Internet	never used	1..2..3..4..5..6..7..8..9..10
31.	Downloading from the web	never used	1..2..3..4..5..6..7..8..9..10
32.	Using the SINA myinternet page	never used	1..2..3..4..5..6..7..8..9..10
33.	Creating web sites	never used	1..2..3..4..5..6..7..8..9..10
34.	Email	never used	1..2..3..4..5..6..7..8..9..10
35.	Chat	never used	1..2..3..4..5..6..7..8..9..10
36.	Scanning	never used	1..2..3..4..5..6..7..8..9..10
37.	Digital cameras	never used	1..2..3..4..5..6..7..8..9..10
38.	Digital video	never used	1..2..3..4..5..6..7..8..9..10

39.	Fixing software problems	never used	1..2..3..4..5..6..7..8..9..10
40.	Fixing hardware problems	never used	1..2..3..4..5..6..7..8..9..10
41.	Computer games	never used	1..2..3..4..5..6..7..8..9..10
42.	Please specify any other computer related tasks you have experienced.		
43.	Tick the things you can do in MS Word □type text □cut & paste text □header/footer □insert symbols □insert text box □save □page margins □zoom function □borders □spell check □print □format font □insert tables □insert breaks □tabs □bullets □saveas html □insert pictures □format paragraph □columns □access a variety of toolbars, □page orientation - landscape/portrait		
44.	If you HAVE used computers in your class this year, which one or more of the computer applications from the table above do you feel helped your students learn better?	Please name software and explain how it/they helped:	
45.	From the above list of computer applications, are there any that you have not used but would like to use?	**Yes / No** If yes, which ones?	

Part 5: Computer Facilities and Use: At Home

46.	Do you have a computer/lap-top that is supplied by or leased from your school?	**Yes / No**
47.	Do you own a computer at home?	**Yes / No**
48.	Do you have Internet access at home?	**Yes / No**
49.	AT HOME, do you use a computer for work related to teaching?	**Yes / No**

If you answered **Yes** to Q47, please circle either **Yes** or **No** to each of the following statements about using the computer **AT HOME** for teaching. Otherwise select **NA**.

49.1.	AT HOME I use the computer for administrative purposes (e.g., reporting)	**Yes / No /NA**
49.2.	AT HOME I use the computer for producing teaching materials (e.g., worksheets, tests)	**Yes / No /NA**
49.3.	AT HOME I use the computer for planning lessons based on using specific software.	**Yes / No /NA** Please specify software:
49.4.	AT HOME I use the computer to search for teaching materials and ideas on websites	**Yes / No /NA**

49.5.	AT HOME I use the computer for e-mailing other teachers/students, etc.	**Yes / No /NA**
49.6.	AT HOME I use the computer for other purposes.	**Yes / No /NA** Please specify:

Part 6: Computer Facilities and Use: At School

50.	What is the priority given to computer use within your school (in the school policy)?	Low priority → High priority 0 1 2 3
51.	How are computers organised in your school? Please tick <u>one or more</u> responses	☐ no school computing resources ☐ laboratories ☐ clusters/pods of machines in classrooms ☐ shared clusters/pods of machines near classrooms ☐ students own or lease computers/lap-top programme ☐ other ……
52.	Have you <u>seen</u> computers used in a <u>school setting</u> in the past six months?	**Yes / No** In what circumstances?
53.	Have you <u>used</u> computers in <u>your classroom</u> in the past six months?	**Yes / No** In what circumstances?
54.	When was the last time **you** <u>used</u> computers in <u>your classroom</u>?	
55.	On average, how often do **you** use a computer in your classroom? Please tick:	☐ Daily ☐ More than twice a week ☐ Weekly ☐ A few times a term ☐ Never
56.	When was the last time **your students** <u>used</u> computers in <u>your classroom</u>?	
57.	How often have **your students** used computers in your classes this year? Please circle:	☐ Daily ☐ More than twice a week ☐ Weekly ☐ A few times a term ☐ Never

58.	Do you believe that using computers for learning helps **your students** understand better? *[If you do not use computers with your students for learning, do you think it would help them if you did?]*	**Yes / No / Unsure** Why? *Yes / No / Unsure* *Why?*
59.	Who teaches your students when they use computers for learning at school? Please tick	☐ You, because you are their teacher ☐ You, because you are also the IT teacher ☐ Another teacher who has IT qualifications ☐ Another teacher who has IT experience ☐ Other. Please explain: N/A
60.	If you are NOT the teacher involved, please describe what you know about the students' activities in using computers to learn.	N/A
61.	What do you like (or think you might/would like) about students using computers in classes?	
62.	What don't you like (or think you might not/would not like) about students using computers in classes?	

Part 7: Any Other Comments

63.	What factors encourage you to use computers to teach? Please list:	
64.	What factors discourage you from using computers to teach? Please list:	
65.	Please write about any facet of your experience of using computers or any other technologies to teach that you would like to tell me about or to expand upon	

Thank you for completing this survey

Teachers Mentored by Students in Using Information and Communication Technologies (2006)

This survey is part of my doctoral research aiming to explore a model of teacher professional development where students mentor teachers in the use of information and communication technologies.

The survey is divided into six parts. There are no correct or incorrect answers to the questions. I am only interested in your personal opinion. Your answers will be kept confidential.

Part 1: About You

Answer each of the following questions by circling an appropriate response or filling in the spaces:

1.	Name	
2.	School Name	
3.	Gender	Female / Male
4.	Grade level	Circle: P 1 2 3 4 5 6

Part 2: Computers and You - Attitudes and Confidence

5.	Rate your <u>confidence</u> with the computer.	Low → High 1..2..3..4..5..6..7..8..9..10	Comment:
6.	Rate your willingness to have-a-go at new computing applications.	Low → High 1..2..3..4..5..6..7..8..9..10	Comment:
7.	Including this year, how many years have you used computers at school?		
8.	When teachers talk about using computers in your classroom how do you feel?		
9.	Who do you go to for help with computers?		

Part 3: Computers and You - Skills

How would you rate your level of ability with the following computer applications and tasks:

	Software type or name equivalent	low	high
10.	Your overall skill with computers	never used	1..2..3..4..5..6..7..8..9..10
11.	MS Word	never used	1..2..3..4..5..6..7..8..9..10
12.	MS Excel	never used	1..2..3..4..5..6..7..8..9..10
13.	MS PowerPoint	never used	1..2..3..4..5..6..7..8..9..10
14.	MS FrontPage	never used	1..2..3..4..5..6..7..8..9..10
15.	KidPix	never used	1..2..3..4..5..6..7..8..9..10
16.	Inspiration/Kidspiration	never used	1..2..3..4..5..6..7..8..9..10
17.	MicroWorlds	never used	1..2..3..4..5..6..7..8..9..10

18.	HyperStudio	never used	1..2..3..4..5..6..7..8..9..10
19.	Kahootz	never used	1..2..3..4..5..6..7..8..9..10
20.	Searching the Internet	never used	1..2..3..4..5..6..7..8..9..10
21.	Downloading from the web	never used	1..2..3..4..5..6..7..8..9..10
22.	Using the SINA myinternet page	never used	1..2..3..4..5..6..7..8..9..10
23.	Creating web sites	never used	1..2..3..4..5..6..7..8..9..10
24.	Email	never used	1..2..3..4..5..6..7..8..9..10
25.	Chat	never used	1..2..3..4..5..6..7..8..9..10
26.	Scanning	never used	1..2..3..4..5..6..7..8..9..10
27.	Digital cameras	never used	1..2..3..4..5..6..7..8..9..10
28.	Digital video	never used	1..2..3..4..5..6..7..8..9..10
29.	Fixing software problems	never used	1..2..3..4..5..6..7..8..9..10
30.	Fixing hardware problems	never used	1..2..3..4..5..6..7..8..9..10
31.	Computer games	never used	1..2..3..4..5..6..7..8..9..10
32.	Please list any other computer related tasks you have experienced.		
33.	Please list any computer programs above that you have not used but would like to?		
34.	Which one or more of the computer applications from the table above do you feel helped you learn better?	Please name application and explain how it helped:	
35.	Tick the things you can do in MS Word ☐type text ☐cut & paste text ☐header/footer ☐insert symbols ☐insert text box ☐save ☐page margins ☐zoom function ☐borders ☐spell check ☐print ☐format font ☐insert tables ☐insert breaks ☐tabs ☐bullets ☐saveas html ☐insert pictures ☐format paragraph ☐columns ☐access a variety of toolbars, ☐page orientation - landscape/portrait		

Part 4: Computer Facilities and Use: At Home

36.	Do you have a computer at home?	**Yes / No**
37.	Do you have Internet access at home?	**Yes / No**
38.	Tick the things you do at home on your computer.	☐ Homework ☐ search the web, ☐ email ☐ downloading music ☐ MSN ☐ other ……

Part 5: Computer Facilities And Use: At School

39.	How are computers organised in your school? Please tick <u>one or more</u> responses	☐ no school computing resources ☐ laboratories ☐ clusters/pods of machines in classrooms ☐ shared clusters/pods of machines near classrooms ☐ students own or lease computers/lap-top programme ☐ other ……
40.	Have you <u>seen</u> computers used in your <u>school</u> n the past six months?	**Yes / No** How?
41.	Have you <u>used</u> computers in <u>your classroom</u> in the past six months?	**Yes / No** How?
42.	When was the last time **you** <u>used</u> computers in <u>your classroom</u>?	
43.	On average, how often do **you** use a computer in your classroom? Please tick:	☐ Daily ☐ More than twice a week ☐ Weekly ☐ A few times a term ☐ Never
44.	When was the last time **your teacher** <u>used</u> a computer in <u>your classroom</u>?	
45.	Do you believe that using computers for learning helps **you** understand better?	**Yes / No / Unsure** Why?
46.	Who teaches you when you use computers for learning at school? Please tick	☐ Your classroom teacher ☐ The IT specialist teacher
47.	What do you like about using computers in school?	
48.	What don't you like about using computers in school?	

Part 6: Any Other Comments

49.	Please write about any facet of your experience of using computers or any other technologies to teach that you would like to tell me about or to expand upon	

Thank you for completing this survey

Donna Gronn – Doctoral Study – ACE Mentors for teachers in ICT

Name: _____   **One year later**

1. In relation to your confidence with the computer, where would you place yourself on a scale from 0-10 now?

   0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2. Are you using Computers / ICT more or less than you were one year ago? Please explain how you are using them.

   ....
   ....
   ....

3. What do you see as the main influences on your increased / decreased /no change in the use of computers?

   ....
   ....
   ....

4. What contact do you now have with your student mentors for 2006?

   ....
   ....

5. What benefits do you see have come from the use of student mentors in 2006 in regard to:

   a. You personally (including your knowledge/skills/confidence?

      ....
      ....
      ....
      ....

   b. Your classroom/teaching practice?

      ....
      ....
      ....
      ....

   c. The student mentors?

      ....
      ....
      ....

TEACHERS MENTORED BY STUDENTS IN USING ICT
INTERVIEW GUIDE

THIS INTERVIEW GUIDE CONSISTS OF THE QUESTIONS THAT WILL BE USED AS A BASIS FOR THE INTERVIEWS WITH THE TEACHERS, COORDINATORS/PRINCIPALS AND CHILD MENTORS WITHIN THE PROGRAM. IT CONTAINS A SEPARATE PAGE FOR EACH PERSON.

PLEASE NOTE
INDIVIDUAL AND GROUP INTERVIEW QUESTIONS WILL BE DECIDED UPON AS THE RESEARCH PROGRESSES. THEY WILL ARISE FROM THE OBSERVATIONS OF THE RESEARCHER AND WILL DEPEND ON THE DIRECTION THE RESEARCH TAKES. THE INTERVIEWS WILL BE GENERALLY OPEN-ENDED AND DRAW ON THE PARTICIPANT'S FEELINGS AND OBSERVATIONS OF THE RESEARCH. THESE QUESTIONS WILL BE USED AS A BASIS.

TEACHER INTERVIEW QUESTIONS

Individual and Group Interview questions will be decided upon as the research progresses. They will arise from the observations of the researcher and will depend on the direction the research takes. The interviews will be generally open-ended and draw on the participant's feelings and observations of the research. These questions will be used as a basis.

Focus Questions for Teachers

State the Teacher's Name & grade they teach (or position in school):

Student Mentors' Names:

Tell me your mentoring story.

Learner

1. What type of learner do you see yourself as?
2. Has this experience changed or reinforced that? How?

Relationships

3. Describe the relationship you have with the students in your class?
4. What was your previous relationship with your new mentor/s?
5. Do you have other mentoring experience (either as mentor / mentee /observer)?
6. Do you use student/student or adult/child mentoring in your classroom? Please explain.
7. Have these sessions influenced your relationship with the student mentors? How?
8. Have these sessions influenced your teaching/classroom in any way? How?

Feelings

9. How did you feel just prior to beginning these sessions with the children?
10. How did you feel walking into the computer room?
11. How did you feel sitting at the computer that first session?
12. How did you feel as you saved your file for the first session?
13. Did the children make you feel at ease? How?
14. We have talked a lot about your feelings prior to starting. Did these feelings change? How or to what did they change?
15. Are there other situations in your teaching career that have made you feel that way?
16. How did the children seem to be feeling when you first sat at the computer?
17. When did they relax/…? (whatever necessary)
18. How did you feel just prior to beginning the second session with the children?
19. How did you feel sitting at the computer that second session?

20. How did you feel as you saved your file for the second session?

Learning

21. How would you describe the teaching approach used by the children?
22. Do you feel the children actually enhanced your exploration/learning of the software.
23. In what ways?   B. When?   C. How?
24. What qualities did you see in the child/ren who mentored you?
25. Which of these were useful to your learning?
26. Were there any qualities that were detrimental to your learning? Please explain.
27. What have you gained from these sessions with the children?
    (computer/personal/insights etc.)
28. Please compare these sessions with PD you have had with adults.

Follow up

29. Do you feel the need for other sessions with the children?
30. How do you think the children could assist you in the future?
31. Have the children been available to you between sessions?
32. Have you taken advantage of that.
33. Would you like to make any other comments?

COORDINATING TEACHER AND PRINCIPAL INTERVIEW QUESTIONS

Individual and Group Interview questions will be decided upon as the research progresses. They will arise from the observations of the researcher and will depend on the direction the research takes. The interviews will be generally open-ended and draw on the participant's feelings and observations of the research. These questions will be used as a basis. These are asked in addition to the general teacher questions.

Focus Questions for Coordinating Teachers and Principals

State the Teacher's Name & grade they teach (or position in school):
Student Mentors' Names:

1. Tell me the story of this mentoring program for you.
   Include:
   a. Process

   b. Emotions

   c. Confidence

   d. Children
      i. Group
      ii. Specific children
      iii. Expected/unexpected
      iv. Surprises

   e. Teachers
      i. Comments
      ii. Expected/unexpected
      iii. Surprises

   f. Qualities

   g. Parents
      i. Comments?

   h. Spin offs

<u>CHILD MENTOR INTERVIEW QUESTIONS</u>

Individual and Group Interview questions will be decided upon as the research progresses. They will arise from the observations of the researcher and will depend on the direction the research takes. The interviews will be generally open-ended and draw on the participant's feelings and observations of the research. These questions will be used as a basis.

Focus Questions for Child Mentors

State the child's name & grade:

Mentor partner's name:

Teacher mentored name:

Learner

1. How do you like to learn? What is your favourite sort of learning?

Relationships

2. Did you know (teacher) before you mentored them?
3. How do you think you and your partner worked together?
4. Did you talk between sessions about what to do? Did you discuss who says what?

Your Feelings – Why?

5. How did you feel when (class teacher) first told you about this mentoring?
6. How did you feel after you had been taught the information?
7. How did you feel going in the first day?
8. How did you feel coming out the first day?
9. How do you feel now?

Teacher feelings

10. How do you think the teacher felt coming in the first day?
11. How do you think they felt at the end of that session?
12. How do you think they feel now?

Your Learning

13. Did you learn anything for these sessions?
14. Did you take any ideas home to your family?

Teacher learning

15. Do you think the teacher learnt anything? What?

Follow up

16. Do you think the teacher needs more sessions with you? Doing what?
17. Has the teacher asked you to help between sessions?
18. Have you helped?
19. Would you like to say anything else about the mentoring?

Teachers Mentored by Students with ICT – Observation Proforma

Observations – Mentor

			Illustrative example		
characteristics and environment	i.	**Mentor Charactereristics**	**personal traits**		**??**
			C1. calming C6. reassuring C2. caring C7. supportive C3. encouraging C8. understanding C4. friendly C9. warm C5. kind		C10. interested C11. protective C12. respectful C13. sensitive to others C14. trustworthy
	iii.	**Learning Environment [manner of interaction]**	C15. affirm-support C16. challenge mentees C17. constructive (critical friend) C18. create safe context C19. encourage mentees C20. encourage risk taking C21. expect excellence –high expectations/show confidence in mentee C22. inspire C23. motivate mentee C24. non judgmental C25. nurture creativity –[encourage teacher to try things] C26. praise C27. provide correction (gently) C28. use humor		
model	iv.	**Approach [How they teach]**	C29. guide learning C30. model learning		
interaction	v.	**Interaction - explanations [How they tell - content model]**	C31. advise or tell C32. explain clearly C33. make goals explicit C34. rephrase explanations (for greater understanding)		
	vi.	**Interaction - discourse [How encourage learning- foster interaction]**	C35. listen actively to mentee C36. narrate observations of growth C37. asks questions C38. self disclose (personal experiences)		
organisation	vii.	**Planning**	C39. logical process C40. set goals for mentee C41. set goals for self		
	viii.	**Management**	C42. accessible [physically] C43. flexible C44. manage time		

Observations - Mentee

Personal characteristics	• <u>self as a learner</u>	R1. self analyse and self reflect R2. set goals
	• <u>relationships</u>	R3. Appreciate efforts of mentor R4. maintain confidences [trustworthy]
	• <u>approach to project</u>	R5. Desire to be mentored R6. Willing to be challenged R7. Willing to be enthusiastic R8. Willing to drive the relationship
	• <u>reactions with mentor</u>	R9. flexible and open to new ideas R10. give mentor feedback on their progress and satisfaction [learning progress] R11. listen and accept guidance and feedback R12. provide feedback to mentor [teaching process]
Learning preferences	• <u>take control of learning</u>	R13. ask questions R14. seek answers
	• <u>persistence</u>	R15. learn by overcoming obstacles after many trials R16. learn by trying R17. learn from their errors
	• <u>making choices</u>	R18. help clarify preferences R19. learn by changing and adapting strategies R20. make choices R21. select activities
	• <u>approach [doing]</u>	R22. learn by doing R23. learn by exploring R24. learn by melding practice with context R25. practise procedures

Relationship between mentor & mentee

T1. Good rapport between mentor and mentee
T2. Trust and confidentiality
T3. Clear objectives and goals
T4. Mutual respect
T5. Clear communication and feedback
T6. Physical environment comfortable
T7. Shared experience
T8. Acknowledgment and celebration of achievements
T9. Others are aware and supportive

Observations - Procedural

1. Turn on camera	• Strap on • Hands clear of lens	• Don't touch screen • Button on top
2. Set the mode	• Dial on top • What mode is it?	• Choose S for simple
3. Check image resolution- recorded pixels	• Press menu • Recorded pixel should be 640 • If wrong – press OK • Use 4 way controller to chose 640x480 • OK MENU	
4. Zoom	• Moves you closer • Digital zoom can blur	• Optical zoom is best
5. Take the photo	• Button on top • Press half way down	• focus - The [ ] middle of screen turns green • Press all the way down
6. Insert Photos to Word		
7. Insert>picture> from file		
8. Download	• Camera off Plug in cord • Turn camera on (view mode • Follow screen instructions (save to your drive) • Camera off and unplug	
9. Edit Photos		
10. Word		
11. Other		

Features Underpinning a Quality Mentoring Relationship

Although the aim of this project was to find teacher reported benefits of child to adult mentoring with ICT, a review of the literature on adult learning and mentoring exposed a list of key features that were likely to occur in a mentoring relationship. These were collated to assist data collection in the mentoring sessions. As the project progressed, various features were observed in the children, teacher and the relationship between them, this led to the refinement of the list to one more appropriate for a child-to-adult mentoring program. The development and refinement of this list of features is outlined in this appendix.

Original Features

The original features, as listed in Figure A6.1, were an amalgamation of the items found in the literature that were seen as pertinent to this study. The features were listed under three key headings; *Mentor*, *Mentee* and *Relationship between mentor and mentee*. Once the data were collected and analysed, it became clear that many items in the list were not as relevant to the child-to-adult mentoring situation as they may have been in the adult-to adult mentoring programs discussed in the literature.

Mentor (C=Child)	Mentee (T=Teacher)	Relationship betw. mentor and mentee (R= Relationship)
C1. Charactereristics	T1. Self as a learner	R1. Good rapport between mentor and mentee
C2. Learning environment [manner of interaction]	T2. Relationships	R2. Trust and confidentiality
C3. Approach [How they teach]	T3. Approach to project	R3. Clear objectives and goals
C4. Interaction–explanations [How they tell - content model]	T4. Reactions with mentor	R4. Mutual respect
		R5. Clear communication and feedback
C5. Interaction–discourse [How they encourage learning- foster interaction]	T5. Take control of learning	R6. Physical environment comfortable
	T6. Persistence	R7. Shared experience
C6. Planning	T7. Making choices	R8. Acknowledgment and celebration of achievements
C7. Management	T8. Approach [doing]	R9. Others are aware and supportive
C8. Relationships between mentors		R10. Locus of control

Figure A6.1. Features underpinning a quality mentoring relationship.

During the analysis the original list of features was used to categorise teachers' comments. In order to assist in the validity of the study by negating researcher bias, two experts were enlisted to code the same pieces of data to the features list. When the coding was discussed it was found that differences between the three academics' coding results were related to ambiguities in understanding the separation of the terms, and also the terms not being distinctly separate in the child-to-adult mentoring situation. It was often found that some teacher comments were rated to two similar features. This showed that there wasn't a distinction between the two items in the list.

These observations led to the refinement of the *features of a quality mentoring relationship* as found in the literature, to a more specific set of *features of a quality mentoring relationship for child-to-adult mentoring*. The experts then coded a new data set and were in agreement on the refined list. This refined set of features was seen as pertinent to any child-to-adult mentoring situation and each feature is further defined with examples here. This is only a small aspect of this research and further research is certainly recommended in this area to further refine these characteristics pertinent to this unique mentoring situation.

New Features

The features observed in this project have been refined to four key items for each section as listed in Figure A6.2. Each of the twelve final features could certainly have been refined further, but it was seen as unnecessary in this situation to have a cumbersome list that only served to make a simple situation too complex. Each feature is described here:

Mentor (CM=Child)	Mentee (TM=Teacher)	Relationship between mentor and mentee (RB=Relationship)
CM1. Personal characteristics	TM1. Self as a learner - specific	RB1. Good rapport
CM2. Learning environment		RB2. Shared experience
CM3. Chosen teaching style	TM2. Approach to project	RB3. Acknowledgement and celebration of achievements
CM4. Relationship between mentors	TM3. Take control of mentoring session	
	TM4. Learning style	RB4. Locus of control

Figure A6.2. Features underpinning a quality child-to-adult mentoring situation.

Characteristics/Features of the Child Mentor

These four features of child mentors were evident during, between and after mentoring sessions and variations of each are expected to be part of any successful child-to-teacher mentoring relationship.

CM1. Personal characteristics

These are the personal characteristics that the child mentors exhibited in and around the sessions. They are a feature of the project as they influenced the whole atmosphere of the project. They have been collated from both teacher and student data, as well as the researcher's field notes. This item covers a broad range of

personal characteristics, with the most frequent discussed here. They vary between children, but the most common characteristics commented on or observed in the project were confidence, nervousness, interest, and feelings of happiness and responsibility.

Almost every teacher commented on the confidence of the children in both interviews and journals. This statement from the principal of one school sums up the teachers' point of view:

> It's also, apart from the actual ICT side of this it is the communication side of it and the confidence of kids to get in there and teach an adult without hesitation … That's been amazing and that's probably what's struck me the most is that the three girls on that first meeting walked straight into it, had the knowledge, had the skills, had the confidence to just interact which was a most positive thing (Peter interview, 13/09/2006).

Part of the reason for this confidence was the fact that the children were enjoying the project. One child Milly, wrote early in the project about her fascination with the project in her journal (*see figure A6.3*). She loved learning about the cameras.
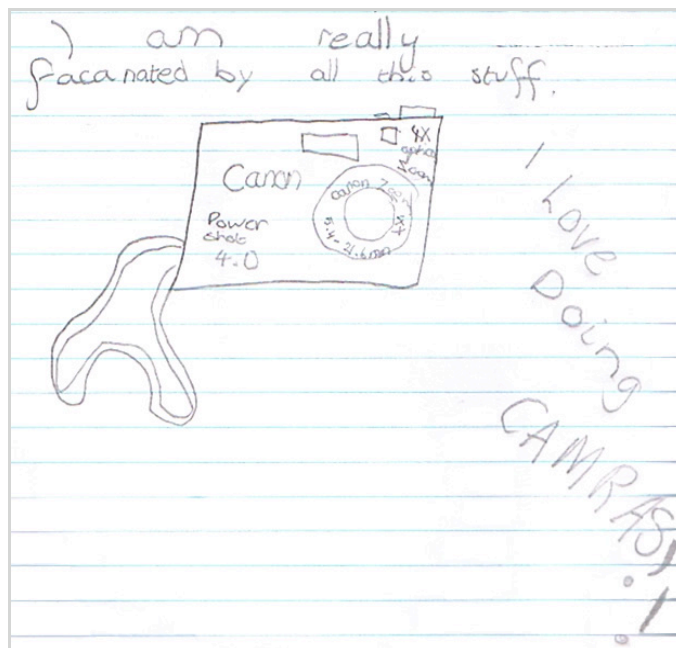
Figure A6.3. Milly, journal, 01/06/2006.

Although the children felt confident overall once they had begun the session, prior to the start of the mentoring, they commented on the initial nervousness they felt. Wayne for example said in his interview that it had made him feel "a bit queasy, nervous because teaching teachers is something a child has never thought of trying

to do" (31/08/2006). Angela, a child at Mountaintop, was a little more explicit in her nervousness as this page from her journal shows (*see figure A6.4*). Her use of upper case letters and many exclamation marks shows her strong feelings.
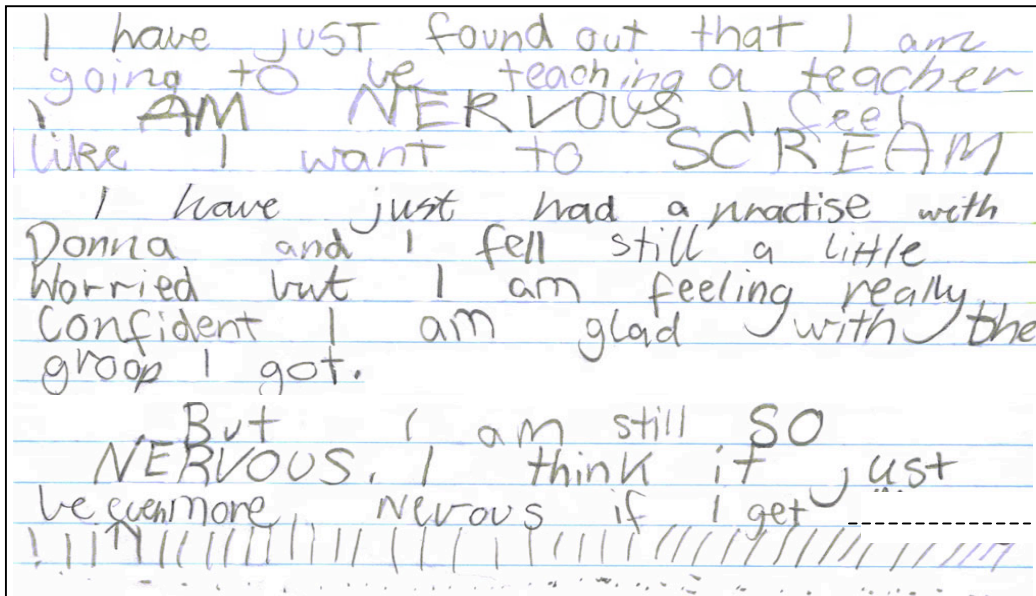
Figure A6.4. Angela's journal, 16/06/2006.

The children also felt a sense of responsibility to the teachers. Some of them commented in their interviews that they were nervous about the session in case they messed up. The teachers and parents also noticed this. This comment by the class teacher of the mentors at Hillside, Angela, explains what the responsibility meant to the children:

> Responsibility. I think they, I have even had parents come up and say how much kids have loved it because they have felt they had a role of responsibility as well. So it's made them responsible for something that before maybe they thought was the Grade 5/6 area, the 5/6s do that, they're the big kids. So they've grown with that sort of part of it as well which I think that's, just that leadership I think has been fantastic for the middle school. (interview, 16/10/2006)

This responsibility led to the children being very thorough in what they presented. They were well prepared for the sessions and used the notes they had been given and personally refined, to assist their teaching. This was clearly how Josie saw the children as her interview comment states: "They were able to explain exactly what they were doing. With their sheet, they knew exactly what they were doing and they could refer back to the sheet, so they were very thorough" (Josie interview, 30/10/2006).

Overall when thinking about the children as mentors and the characteristics they felt and exhibited, Milly seemed to sum it up in her journal comment shown in *Figure A6.5*.
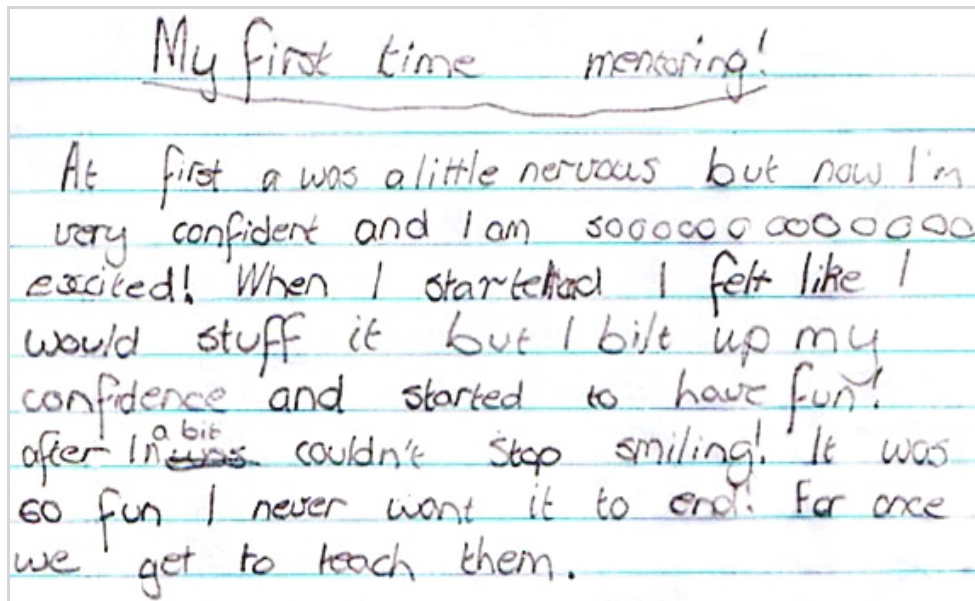
Figure A6.5. Milly, journal, 01/09/2007.

CM2. Learning environment

As well as their personal characteristics, another feature of the project was the behaviours exhibited within the learning environment by the child mentors. These behaviours influenced the environment in which the teams were working. They assisted the children in setting up the type of learning environment in which they wanted to work. Teachers like Derek, commented on the attitude student mentors showed towards the sessions. In his journal he noted,

> They remained in quite a different mode to the usual personality as I see them
> as students. Their interaction was friendly but more official and serious than
> when I normally interacted with them. (06/09/2006)

These behaviours were obvious in sessions, as was seen with Wayne when, as he arranged chairs around the computer for the group in the first session, he said to the teacher: "You get the nice comfy chair." (Wayne, Odette's session 1 transcription, 14/07/2006). So although Wayne was in control of the session as the mentor, he was still respectful of the teacher involved and wanted her to be comfortable in the learning environment.

CM3. Chosen teaching style

Another feature of the child-to-adult mentoring situation was the mentors chosen style of teaching. Teachers know that utilising the preferred learning style of their students is very important. So too is the utilisation of adults preferred learning styles. It was important that the children's teaching style was complementary to the teachers' learning style. Teaching style is a very complex thing, but in this project the focus was on the way the teaching was structured and how the student mentors encouraged the teachers in their learning.

Within the project, the structure of the teaching in the sessions generally meant a choice between two methods, which were discussed with the children prior to, and between sessions. They were:

- Modelling where the child mentors showed the teachers a process (during which most teachers took notes) and then encouraged the teachers to complete the process themselves whilst offering direction where necessary, and
- Directed teaching where the child mentors gave the teacher the equipment and talked them through the process from start to finish with the teacher completing the activity.

Both options encouraged hands-on use of the equipment, which supported the preferred learning style of the teachers. All classroom teachers in the project commented, either in interview or journal that they preferred to be 'hands-on' in their learning and that when the children allowed them to use the equipment they were more able to learn. They wanted to be fully involved in their learning. Joanne, a teacher who had extensive experience in working with teachers in professional development with ICT said in her interview that she was really pleased that the children allowed her to make her own way with the mouse, instead of taking over.

> They were very good in their mentoring and the way they taught me, definitely. Definitely. I thought it was outstanding that they didn't pick up the mouse once. I noticed, and I thought "Good on you girl, you have not picked up", I wrote it in there [journal] that they hadn't picked up the mouse, they didn't, like you know, as adults often jump in … Yeah, they didn't … no, not once have they done that. … Adults, you can't help it, you get frustrated, just go up to file or no can't find it, you know what I mean, like when I am doing little bits of training and I thought that's really good of those children not to jump in, they

let me just, you know, move the mouse, … I thought that was good. (23/08/2006)

Included in this feature is the way the child mentors spoke to the teachers, the verbal cues given throughout the sessions. The children talked the teachers through the processes, but actually allowed them to do it. The girls were observed in Teresa's first session showing her how to do things and then offering "would you like to try that from the start?" or "do you want to have a play now?" (Milly & Ruth, researcher field notes, 16/08/2006). It was also noted in Teresa's second session that there was "really good discussion happening here. They are instructing, chatting and all of it is focused on the learning of the items in the toolbar" (Researcher field notes, 16/08/2006).

The teachers particularly enjoyed the step-by-step, thorough processes that the child mentors followed in their teaching. As Derek noted in his journal, "their step-by-step explanations were well pitched and well-paced. I wasn't bored nor was I wanting them to slow down" (16/08/2006). This simple method combined with the ability to ask questions whenever necessary allowed the teachers to learn at their own pace in a non-threatening environment.

CM4. Relationship between mentors

As the previous quote shows, the child mentors worked well with each other in almost every session. In a couple of instances it took the first session for personalities to sort themselves out, but by the end of the first session all groups were working better than was expected. The children seemed to be so focussed on what they were doing that the personalities didn't really affect the situation. The teachers were very complementary when speaking about the relationship between the children and how it influenced their teaching. As both Derek and Jean stated in their interviews, it was interesting to see that there wasn't a power struggle, one spoke more, but the other followed and assisted when necessary:

> I suppose the two of them interacting was interesting to see too. Sometimes one would dominate and the other would sit back but then the other one would butt in sometimes and that was OK too. There wasn't really a power struggle between the two of them for my time. One of them spoke more but the other one seemed happy enough to let him speak more. (Derek, 06/09/2006)

> One was a leader and one was bit of a follower… I just thought Tamsin had the stronger personality and she [had] sought of taken over, but Laura picked up in the little things she did and she was going step by step in her mind and she came back to Tamsin and said: "have you reinforced this"? (Jean, 23/10/2006)

Overall the children worked well together and produced a great learning environment in which their confidence with ICT and their positive personalities shone. The teachers were impressed by the children and showed particular characteristics of their own which will be elaborated on in the next section.

Characteristics/Features of the Teacher Mentee

These four characteristics of teacher mentees were evident during, between and after mentoring sessions and are expected to be present in any successful child-to-teacher mentoring relationship.

TM1. Self as a learner

How the teachers saw themselves as learners had a major impact on the project. The features they brought to the project influenced the way they approached it and responded to the project and the child mentors. The major features teachers discussed were, willingness to learn, being an active learner, needing revision and initial anxiousness.

All teachers saw themselves as "willing to learn" (Jean, interview, 23/10/2006) Elizabeth related her learning to her teaching when she commented in the interview.

> I am very hands on, I have a go and if it doesn't work it is ok I can undo, especially with computers … but I am a hands on, definitely a hands on, and "have a go" and "you have a go now let me have a go", so which I hope that is how I teach. (25/08/2006)

Rebecca also commented on herself as an active learner, but went further to mention the need for revision:

> I'm actually more an active learner. I need to be able to fiddle with the equipment and be able to play with it and practise it and go over it a few times. And I need to go away and practise by myself because I am not really technologically minded. (interview, 06/12/2006)

Teachers generally commented on being keen to learn, but some also mentioned anxiousness at various stages through the sessions. Fiona was anxious about her ability to achieve, "I wasn't sure what to expect actually, I was worried that I just wasn't going to be able to handle anything and really understand it because I am not very computer literate" (interview, 20/10/2006).

So, the teachers were willing to learn, particularly in a situation where they could get their hands on the equipment and be active in their learning. They also wanted revision or practice time when they could either use their notes or call on their mentors to assist. The project had been developed based on the literature and the fundamentals of adult learning, so it was pleasing to see that the teachers saw themselves similarly. This would have an effect on how the teachers approached the project.

TM2. Approach to project

The approach the teachers had to the project influenced the mentoring sessions with the children. Generally the teachers were enthusiastic for the project overall, though as interview comments from Lesley and Josie show, initially, some had doubts that they would get value for their time. Lesley was very honest, and possibly speaking for most teachers when she stated: "In one way I thought 'not another thing to do' because I just feel like sometimes I am overloaded" (interview, 16/10/2006). Josie agreed but went further to explain how her perceptions changed:

> Look in a way I thought, "one more thing we have to do." Wasn't quite sure of the idea of the younger kids being the mentors, usually, you know, so used to Grade 6 doing everything. But now that I see how well, particularly the two I had, handled it and the fact that they are still in the school for a few years and to teach others, I think that is the key to its success. (interview, 30/10/2006)

Belief in the children and their abilities with ICT had some teachers thinking this could be a good idea. As Chloe stated in her journal after the first session, "I will admit that I was not 100 percent sure what to expect today. But I was very excited, as I believe that we as teachers can learn heaps from children. … Can't wait till next week!" (16/08/2006). Chloe had the belief before the project and it was confirmed by the project, but Rebecca had a realisation that the children in her class could assist her as her interview comment states: "I just really appreciated the opportunity to get

involved. I am really pleased that I did. And I think it's a step in the right direction, you know I am now prepared to ask the kids maybe to help me more" (06/12/2006).

Overall the teachers approach to the project was very positive. Obviously some of the credit for the outcomes achieved must be attributed to their positive approach. Joanne sums up the overall attitude of the teachers in her journal entry after the first mentoring session: "The whole process was very beneficial, hands-on and practical. I was excited at the start of the session and maintained my enthusiasm throughout. A tremendous, useful experience" (16/08/2006).

TM3. Take control of mentoring session

The teachers were not in charge in these mentoring situations, but it was obvious that they were still the adult in the situation by the way many of them controlled parts of the sessions with their questioning techniques. Rebecca's comment in her interview was reminiscent of what was observed throughout the mentoring sessions: "I felt that the children were probably a bit more patient or a bit more flexible [than adults]. I could manipulate them a little bit more by saying slow down, show me how to do that again" (06/12/2006).

Figure A6.6 shows a compilation of some observations of the mentoring sessions. They show the obvious ways teachers took control of the sessions.

> Teacher asked [child mentor] to slow down so she could take notes. … Teacher questioned well. (Odette, session 1, 14/07/2006)
>
> Teacher questioned like a teacher. To ask for clarity. Tried to get girls to explain clearly. (Rebecca, session1, 14/07/2006)
>
> Teacher asked to revise at end – what did we do to get it into Word? She took notes and talked it through. (Teresa, session 3, 30/08/2006)

Figure A6.6. Examples of teacher's control (researcher field notes).

Another way of taking control was in the choice of working with equipment at a time, and/or in a way of their choice. During the mentoring sessions, and between, the teachers often made these choices. This included requesting assistance when and how they chose. An example of this was the fact that one teacher brought her own laptop to her mentoring session (researcher field notes, Teresa session 2). She chose to have her own computer there so that she had copies of what she did with

her mentors on her own computer and did not need to search the school hard drives for her files.

Heather takes this one step further when she talks about her use of the camera outside of school. She not only uses it, she uses it so as to get more familiar with it.

> Oh, I was pretty excited, oh yeah, because we have got a digital at home and I just say [to my husband] "you use it" or [to my son] "you use it" and even when I take it to the football or if we are watching [my son] play, I always pass it off to somebody, but I won't anymore. I am just going to use it so I get more familiar with it. Yeah, so I was pretty excited so that I would be hands-on. (interview, 06/09/2006)

TM4. Learning style

The learning styles of teachers differed slightly, but the most common factor in teachers' learning styles was that they were all hands-on learners. This was important in the project as the child mentors taught to the hands-on learning style. The hands-on learning style was evident in the observations of the researcher as well as the journal notes and interview comments of the teachers, and even in the interview comments of some child mentors. When asked if there were any factors in the sessions that were detrimental to her learning, Lesley commented that her insistence on hands-on learning was what really assisted her to learn:

> If perhaps I'd have let them just show me all the time and do it for me that might have been [detrimental], but because I think it was so important that I learn how to do it, I probably pushed him a little bit and would say "Let me have a turn", "Let me do it". (interview, 16/10/2006)

The project coordinator at Mountaintop had obviously thought about the effect of hands-on learning when she stated in the interview: "Children learn best when it is hands-on. I am pretty sure that the teachers will also" (25/08/2006). This turned out to be a very insightful comment.

As well as being very hands-on with their learning, throughout the project the teachers used some more specific techniques to assist their learning. These included; verbalisation, note taking, requesting clarification, assistance and revision.

It was often observed in the sessions that teachers would verbalise the processes as they stepped through them, as this field note shows: "Teacher now having a go at taking a photo from the start. She talks it through and girls nod and agree as she does it" (Teresa session 2, researcher field notes, 23/08/2006). This was often combined with note taking, as is shown by the researcher's field notes for Odette's second session. "The teacher talked through the process of downloading the photos whilst the girls did it on the computer … Girls talking through process of editing in Word. Teacher took notes as they walked through the process" (Odette's session 2, researcher field notes, 21/07/2006). It was also interesting to see that the roles of operator and verbaliser changed throughout the process.

Odette was meticulous about taking notes. This example from her first session includes her directing and questioning the child mentors so as to ensure her notes were correct:

> I need to write this down. Laugh. I am very sorry, I need to write all this down. So show me again. Show me. Where's the function button. Funct. set and then I can go small or medium1 and it says how many photos can fit on the camera. (14/07/2006)

Roxanne also asked the child mentors for clarification and commented in her interview that she was pleased they were happy to revisit items she had forgotten:

> They were patient. They did go over it again, I remember at one stage I had to have it shown to me again. And then in the next session when I'd forgotten a lot of it I think they went over it a few times. And I asked them to clarify things and they did that, they repeated things. (23/10/2006)

The need for practice or revision was foremost in many teachers' minds. This comment from Joanne's journal is typical of many: "Worried I might forget. Need to practise straightaway" (23/08/2006). Overall Bill's comment about professional development (PD) in general sums up most items teachers discussed or exhibited in the sessions:

> PD generally is lots of talk, talk and not much interaction at all, and like I said, if I record notes and that's the practical side of it and then go back and reflect upon them and re-read them, I then feel as if I am absorbing content. But I know that I am definitely a practical learner so I do need to actually go and do things to understand it so to move things around and to input that and output that and so on. (interview, 25/08/2006)

The characteristics of the child mentors and the teachers individually assisted in setting the tone for the child-to-adult mentoring sessions, but importantly they had to work together for the mentoring to be a success. The key features of this working relationship are outlined in the following section.

Characteristics/Features of the Child-to-Adult Mentoring Relationship

These features in the relationship between teacher mentees and their child mentors were observed during, between and after mentoring sessions and are expected to be part of any successful child to teacher mentoring situation.

RB1. Good rapport

A good rapport between people is fundamental to the relationships success.
Encarta® World English Dictionary defines *rap·port* as "an emotional bond or friendly relationship between people based on mutual liking, trust, and a sense that they understand and share each other's concerns" (Microsoft[1], 1999). The participants in this study certainly fulfil this definition. They are certainly sharing the same vision of gaining ICT skills around the use of the digital cameras and related software and both teachers and students value the relationship that has build up between them. The project has been enjoyed by all and the children relish meeting the teachers in the playground and having a bit of fun with them as Rita's interview comment shows:

> They always stop for a joke and they say "Do you still know how to turn the camera on?" So they know that they can have a joke and usually I lie and say "Yes", [laughter] but no they do, because we had fun while we were working, they know they can take the extra step and have a bit of fun still, so they do and they are very forward children, they are happy to stop and have a chat. (20/10/2006)

The teachers also enjoy the relationship and many commented as Lesley did in her interview that they intend it to continue:

> One thing I've found that's been really good, I don't know whether you were planning, the idea of using that middle school I found was great because I think getting to this stage of the year if it had of been Grade 6 I would be a bit panicky that I was losing my mentors. [You are seeing them as if they are

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[1] Microsoft. (1999). *Encarta World English Dictionary.* Accessed April 15, 2006 at
   http://encarta.msn.com/encnet/features/dictionary/dictionaryhome.aspx

> yours and you will be able to get to them next year.] "Nobody's having them they're mine!" (16/10/2006)

She went on to clarify: "Denis knows me personally and knows how much I know so he, you know, he will know when to back off or he'll know exactly what we've done" (Lesley interview, 16/10/2006). Chloe concurred: "I was very excited when the girls came up the end of the day to show off their badges and certificate. It showed that they enjoyed the experience as much as I did. I hope we can continue to share ideas" (Chloe, interview, 06/09/2006).

The children too reported on the enjoyment of the relationship as Michael's journal comment shows: "I liked how [teacher mentee] was having so much fun with the camera she had so much fun taking photos of us" (30/08/2006).

RB2. Shared experience

For the teacher of the mentor class, there were great gains in learning, particularly learning with the children as the coordinator of the project at Mountaintop's comment shows:

> One step ahead of the kids. I felt at first that that was important but then as the program continued it was good to learn with them because they were teaching me things and I was showing them things and then, we'd both learn things, as a group we would learn things together so I changed my whole way of looking at the whole thing. (interview, 25/08/2006)

This shared experience was also common with the other teachers and became a feature of the project. An example of this is the comment by Chloe in her interview where she explains the importance of enjoying the experience together: "I was really looking forward to it and the kids, as I said before, love it, so it is something you can enjoy together" (06/09/2006).

The value of the whole experience to the student mentors was measured in many ways. They were not only in the sessions with the teachers, but also worked with them in classroom situations. As Moira explained in her interview they were sharing the camera experience by working together and supporting the teacher:

> I got them out there one day when we had an incursion, a woodwork incursion, so I got them to sort of stand beside me and make sure I was doing

all the right things, so that was really, it was good to have someone, as I say, just standing there as support and saying "well, what do I do now" and they would tell me and it was very good and they felt very important coming out to sort of help and they sort of take it in their stride and I think it is wonderful. (06/09/2006)

RB3. Acknowledgement and celebration of achievements

The acknowledgement and celebration of achievements did not feature strongly, but they were obvious in the comments teachers made throughout the project. Comments like, "Fantastic. You are very good at explaining" by Odette in her first session (14/07/2006) show her acknowledging the mentors work. Rebecca even typed in this comment during her third session to show her appreciation: "I am feeling very pleased to be learning these skills because I am able to use them to edit my holiday pictures" (researcher field notes, 28/07/2006).

At the completion of the project all mentors at Mountaintop received badges and certificates for their participation and achievements in the program. These were presented in the classroom and the children asked to go and show their mentees their certificates and badges. As Kat noted in her final journal entry, "They were very happy with the whole experience. I said I was proud of them and they said 'no we are proud of you!'" A celebration for all concerned.

RB4. Locus of control

The locus of control focuses on who is in control of a situation. This is not just about who is using the equipment, it is more about who is leading the session or directing the progress of the session. So who was in control in the mentoring sessions? It was intended that the students would be in control and it was obvious, in viewing the sessions that the children were certainly in control of the overall session and the content that was taught. There were some stages however when the teachers felt the need to know or experience a specific thing, so they took control for that short time. As the comment by Lesley shows, the children were able to rein in the situation when the need arose:

They led by example, so in some respects they'd show me a step on how to do something on the computer in relation to cropping or just downloading the

photos and they gave me the initial step, I would then see whether that was suiting what I wanted I suppose but then I'm just trying to work out whether I would say "Let me have a go now" or they would come out and say "OK, no, you do it". And I think there was a little bit of both. Sometimes I would say "OK, you have shown me, I want to do it now by myself" or at the beginning of the session I'd have my notes and I would say "Let me get to that point by myself" and they would jump in and say "Oh wait you've made a mistake there" or whatever. (interview, 16/10/2006)

The child mentors certainly felt a responsibility to control the situation as is shown by Violet's comment in her interview: "Once she had no strap on her arm, so we had to go in and say 'I'm your mentor and you have to put the strap on your arm'" (25/08/2006).

The ICT skills and confidence of the children in the project, combined well with the environment they fostered for the mentoring sessions. The teachers' attitudes towards the project as well as their personal learning styles complemented the child mentors. This allowed a relationship to develop between these key roles, which enabled both teachers and children to grow from their shared experience. As well as gains for teachers, students and schools, the data collected allowed for a refinement of both the assumptions this mentoring program was based on and the features underpinning this quality relationship in the child-to-adult mentoring program. It is anticipated that these features will continue to be refined in future research.

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LETTER TO TEACHER PARTICIPANTS

TITLE OF PROJECT: **TEACHERS MENTORED BY STUDENTS IN USING ICT.**

STAFF INVESTIGATOR: **DONNA GRONN**

Dear Participant,

I am conducting a doctoral research that aims to investigate the value of utilising the confidence children show with technology in a positive way to assist the teachers in the learning of technology. The research aims to further develop a model I have piloted, where students act as ICT mentors to teachers. For many years now schools have attempted to develop their staff into confident and competent users of Information and Communications Technology (ICT) in their classrooms. Yet many staff lack confidence in understanding and using ICTs. One approach is to use the students' knowledge and skills to advantage. This research aims to further develop a model where students act as ICT mentors to teachers. The students in a class will become proficient with a new piece of software or computer peripheral and they in turn will act as mentors for the school's teachers to develop their proficiency with the software/peripheral. A school staff member or the researcher will expose the children to the software/peripheral. Under this persons supervision the children will explore the software/peripheral until they have a working knowledge of the majority of facets of the program/peripheral. The teachers and students will form groups of one staff and two students. The researcher will observe. She will look at the way students and teachers communicate when the students are placed in a mentor role. She will also observe the effect the roles have on each group of participants. It is proposed that the staff will then seek out their mentor/s when they have a problem or issue with technology. The researcher will interview all participants in either group or individual sessions. These interviews will be audio taped for later analysis.

Both staff and students may feel minor discomfort with this mode of learning and teaching initially, but pilot study experience with this mode of mentoring, shows this is rare and should subside with continued involvement and success.

The student participants will spend up to four hours of class time over a four-week period exploring the computer program under the guidance of the teacher/researcher. Both students and staff will then attend four thirty-minute professional development sessions over a four-week period. These sessions will have the students as mentors and the researcher observing.

There may also be further times that individual mentoring pairs will meet to further explore the program/peripherals.

The major benefit for both staff and student is the knowledge, skills and confidence gained from learning the program and the personal growth developed via the mentoring experience. If this study finds that the mentoring experience described above is successful in a range of school settings, it has great implications for the professional development of teachers particularly in the area of ICT but possibly in other areas of the curriculum. If we can have a confident group of students mentoring staff in schools the burden of professional development is shared. This enables those who are more confident in particular areas to share their experiences, no matter what age.

Participants are free to refuse consent altogether without having to justify that decision, or to withdraw consent and discontinue participation in the study at any time without giving a reason. The data collected throughout this study may be used in publications, in teaching or shared with other researchers, but confidentiality of schools', teachers' and students' identities will be maintained at all times. Reports or publications arising from the study will not enable anyone to identify the school, teachers or students.

Any questions regarding this project should be directed to Mrs Donna Gronn (Tel: 9953 3284) at School of Education, Australian Catholic University, St Patrick's Campus, 115 Victoria Parade, Fitzroy 3065.

Following the data analysis, I would be pleased to share a copy of my major findings with you should you indicate an interest in this.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University. In the event that you have any complaint or concern about any aspect of this study, or if you have any query that I have not been able to satisfy, you may write to: the Chair of the Human Research Ethics Committee, C/o Research Services, Australian Catholic University, Melbourne Campus, Locked Bag 4115, Fitzroy VIC 3065 (Tel: 9953 3157; Fax: 9953 3315). Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.

If you agree to participate in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to the Investigator.

Yours sincerely

Donna Gronn

Lecturer in Education

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

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LETTER TO PARENT/GUARDIAN OF STUDENT PARTICIPANTS

TITLE OF PROJECT: **TEACHERS MENTORED BY STUDENTS IN USING ICT.**

STAFF INVESTIGATOR: **DONNA GRONN**

Dear Parent/Guardian,

I am conducting a doctoral research that aims to investigate the value of utilising the confidence children show with technology in a positive way to assist the teachers in the learning of technology. The research aims to further develop a model I have piloted, where students act as ICT mentors to teachers. For many years now schools have attempted to develop their staff into confident and competent users of Information and Communications Technology (ICT) in their classrooms. Yet many staff lack confidence in understanding and using ICTs. One approach is to use the students' knowledge and skills to advantage. This research aims to further develop a model where students act as ICT mentors to teachers. The students in a class will become proficient with a new piece of software or computer peripheral and they in turn will act as mentors for the school's teachers to develop their proficiency with the software/peripheral. A school staff member or the researcher will expose the children to the software/peripheral. Under this persons supervision the children will explore the software/peripheral until they have a working knowledge of the majority of facets of the program/peripheral. The teachers and students will form groups of one staff and two students. The researcher will observe. She will look at the way students and teachers communicate when the students are placed in a mentor role. She will also observe the effect the roles have on each group of participants. It is proposed that the staff will then seek out their mentor/s when they have a problem or issue with technology. The researcher will interview all participants in either group or individual sessions. These interviews will be audio taped for later analysis.

Both staff and students may feel minor discomfort with this mode of learning and teaching initially, but pilot study experience with this mode of mentoring, shows this is rare and should subside with continued involvement and success.

The student participants will spend up to four hours of class time over a four-week period exploring the computer program under the guidance of the teacher/researcher. Both students and staff will then attend four thirty-minute professional development sessions over a four-week period. These sessions will have the students as mentors and the researcher observing.

There may also be further times that individual mentoring pairs will meet to further explore the program/peripherals.

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Participants are free to refuse consent altogether without having to justify that decision, or to withdraw consent and discontinue their child's participation in the study at any time without giving a reason.

The data collected throughout this study may be used in publications, in teaching or shared with other researchers, but confidentiality of schools', teachers' and students' identities will be maintained at all times. Reports or publications arising from the study will not enable anyone to identify your child.

Any questions regarding this project should be directed to Donna Gronn (Tel: 9953 3284) at School of Education, Australian Catholic University, St Patrick's Campus, 115 Victoria Parade, Fitzroy 3065.

Following the data analysis, I would be pleased to share a copy of my major findings with you should you indicate an interest in this.

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If you agree for your child to participate in this project, you should sign both copies of the Consent Form, retain one copy for your records and return the other copy to your child's class teacher.

Yours sincerely

Donna Gronn
Lecturer in Education

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

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TEACHER CONSENT FORM
(Teacher Copy)

TITLE OF PROJECT:

TEACHERS MENTORED BY STUDENTS IN USING ICT.

NAME OF STAFF INVESTIGATOR: **DONNA GRONN**

I .... *(the participant)* have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I will be involved in learning new technology skills with the assistance of students within the school and will keep a written journal, be observed, interviewed and audio taped by the researcher throughout the project. I realise that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: ....

(block letters)

SIGNATURE OF PARTICIPANT: ....DATE ....

SIGNATURE OF PRINCIPAL INVESTIGATOR:....................................DATE:…………..........

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TEACHER CONSENT FORM
(Researcher Copy)

TITLE OF PROJECT:

TEACHERS MENTORED BY STUDENTS IN USING ICT.

NAME OF STAFF INVESTIGATOR: **DONNA GRONN**

I .... *(the participant)* have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I will be involved in learning new technology skills with the assistance of students within the school and will keep a written journal, be observed, interviewed and audio taped by the researcher throughout the project. I realise that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: ....

(block letters)

SIGNATURE OF PARTICIPANT: .... DATE ....

SIGNATURE OF PRINCIPAL INVESTIGATOR: .... DATE:………...........

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PARENT/GUARDIAN AND PARTICIPANT AGED UNDER 18 YEARS CONSENT FORM

(Parent/Guardian Copy)

TITLE OF PROJECT: **TEACHERS MENTORED BY STUDENTS IN USING ICT.**

NAME OF STAFF INVESTIGATOR: **DONNA GRONN**

We .... (*the parent/guardian*) and
.... (*the participant aged under 18 years*) have read and understood the information provided in the Letter to the Participants. Any questions we have asked have been answered to our satisfaction. We agree that the child, nominated below, may participate in this activity, realising that they will be involved in assisting teachers to learn new technology skills and will complete a written journal, be observed, interviewed and audio taped by the researcher throughout the project. We realise that we can withdraw our consent at any time. We agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify this child in any way.

NAME OF CHILD: ....
(block letters)

SIGNATURE OF CHILD: ....DATE: ....

NAME OF PARENT/GUARDIAN: ....
(block letters)

SIGNATURE OF PARENT/GUARDIAN: .... DATE.............

SIGNATURE OF PRINCIPAL INVESTIGATOR .... DATE.............

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

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 http://www.acu.edu.au

PARENT/GUARDIAN AND PARTICIPANT AGED UNDER 18 YEARS CONSENT FORM

(Researcher Copy)

TITLE OF PROJECT: **TEACHERS MENTORED BY STUDENTS IN USING ICT.**

NAME OF STAFF INVESTIGATOR: **DONNA GRONN**

We .... (*the parent/guardian*) and
.... (*the participant aged under 18 years*) have
read and understood the information provided in the Letter to the Participants.
Any questions we have asked have been answered to our satisfaction. We agree
that the child, nominated below, may participate in this activity, realising that
they will be involved in assisting teachers to learn new technology skills and will
complete a written journal, be observed, interviewed and audio taped by the
researcher throughout the project. We realise that we can withdraw our
consent at any time. We agree that research data collected for the study may be
published or may be provided to other researchers in a form that does not
identify this child in any way.

NAME OF CHILD: ....

(block letters)

SIGNATURE OF CHILD: .... DATE: ....

NAME OF PARENT/GUARDIAN: ....

(block letters)

SIGNATURE OF PARENT/GUARDIAN: .... DATE ....

SIGNATURE OF PRINCIPAL INVESTIGATOR .... DATE ....

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne

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Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: Prof Doug Clarke   Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Donna Gronn   Melbourne Campus

Ethics approval has been granted for the following project:
Teachers mentored by students in using ICT

for the period: 8.3.2006 - 31.12.2006

Human Research Ethics Committee (HREC) Register Number: V200506 32

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (1999) apply:

(i)   that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
- security of records
- compliance with approved consent procedures and documentation
- compliance with special conditions, and

(ii)   that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
- proposed changes to the protocol
- unforeseen circumstances or events
- adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than minimum risk. There will also be random audits of a sample of projects considered to be of minimum risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: ....   Date: ....
        (Research Services Officer, Melbourne Campus)

Changing teacher-student relationships through ICT: Student mentors in Australia

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Australian Catholic University
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Key words: student mentors, relationships, practical, teacher professional development, ICT

Abstract:
This doctoral study focused on the development of a relationship between teachers and their students, in a context where nine- and ten-year old students mentored teachers in the development of their knowledge, skills and confidence in the use of digital cameras and related software in their classrooms. Throughout the process, growing confidence was observed in both teachers and child mentors, and a relationship highly valued by both developed. Teacher learning gains were evident early in the study. Of particular note were the unexpected gains related to teacher insights regarding enhanced children's confidence, and the possibilities this created for the whole school learning community.

Purposes

Technology continues to have an influence in Australian schools, but many teachers are still not comfortable with its use in their classrooms (Pina & Harris, 1993; Smith, 2000; Tenore, 2000). This study explored the possibility of teachers becoming more confident and skilful with ICT in their classrooms by relying on the knowledge and skills of children to mentor them in their learning of ICT. The process aimed to take the pressure off the ICT 'experts' in schools to allow them to focus on mentoring a group of students, who in turn took on the role of mentoring the school staff. The implementation of this mentoring model was studied in two different settings to determine the benefits and impediments to its success, and the effect it had on the knowledge, skills and confidence of the teachers involved, and subsequent impacts on classroom practice.

Theoretical Framework

Different scholars have offered frameworks for viewing professional learning. Relevant to this study are those who relate to mentoring and/or technology. Loucks-Horsley, Stiles and Hewson (1996) developed relevant strategies for professional learning focussing on coaching and mentoring (Fig. 1).

Their model of Workshops, Institutes, Courses and Seminars highlighted the fact that there must be opportunity for the learners to shape the sessions, time for reflection, prediction and exploration, and a safe environment for experimentation. Teachers need to know that the professional learning in which they are participating impacts on their teaching, and, like children, they want to explore and experiment.

	Coaching and Mentoring		
usually occurring	• both in & out of class		
opportunities	• formal & structured		
facilitators or leaders	• one- on-one	•	knowledge & skills of more experienced adult
time periods	• vary but ongoing		
Learning goals addressed	• provide confidence and ability to improve practice		
key elements	• focus on learning or improvement • opportunities for interaction	•	mechanisms for sharing & feedback
implementation requirements	• climate of trust, collegiality, continuous growth • administrative support	•	long term commitment to interaction • skill building in coaching & mentoring
must contain	• trust & sharing relationships to overcome norms of isolation & privacy	•	approaches vary. choose one that suits. • time to meet etc

Figure 1. Relevant strategies for professional learning (adapted from Loucks-Horsley et al, 1996.)

The Loucks-Horsley et. al. model was not specifically for technology so further models were explored. Rodriguez & Knuth, (2000) created a model of effective professional development specifically for technology. The components that they identified as essential to effective professional development for technology in schools, as outlined in Figure 2, are relevant to any model for professional development for technology in schools.

Connection to Student Learning	Ongoing Process
Hands-On Technology Use	Sufficient Time
Variety of Learning Experiences.	Technical Assistance and Support
Curriculum-Specific Applications	Administrative Support
New Roles for Teachers	Adequate Resources
Collegial Learning	Continuous Funding
Active Participation of Teachers	Built-In Evaluation

Figure 2. Components of effective professional development for technology use

(Rodriguez & Knuth, 2000).

The model used in this study is primarily an adaptation of Rodriguez & Knuth and Loucks-Horsley et. al, with two major influences. Firstly, the facilitator in this mentoring was not a more experienced adult, but a child who has more relevant experience with ICT than the adult. Secondly, the relationship between the mentor and the mentee is a major focus. Neither of these were a focus of the research explored in the literature, so an adapted model has been created to include these two items seen as crucial to the present study.

The model developed for teacher professional development using children as mentors is shown in Figure 3. This shows the teacher at the centre, and ICT and child mentors alongside the teacher, emphasising the importance of the relationship. The relationship symbol has sixteen key items surrounding it. These items are broken visually into two groups with all informing the process of mentoring between the student mentor and the teacher as mentee. The green octagonal shapes are focused on the teacher, so are closest to the centre. The arrows show items that influence the teacher. Some of these involve the relationship with the children, while others are items that will show themselves through the course of the mentoring, but would not be directly observable during the sessions. This model structured the form

of the program in the schools, and was part of what guided data collection and analysis.
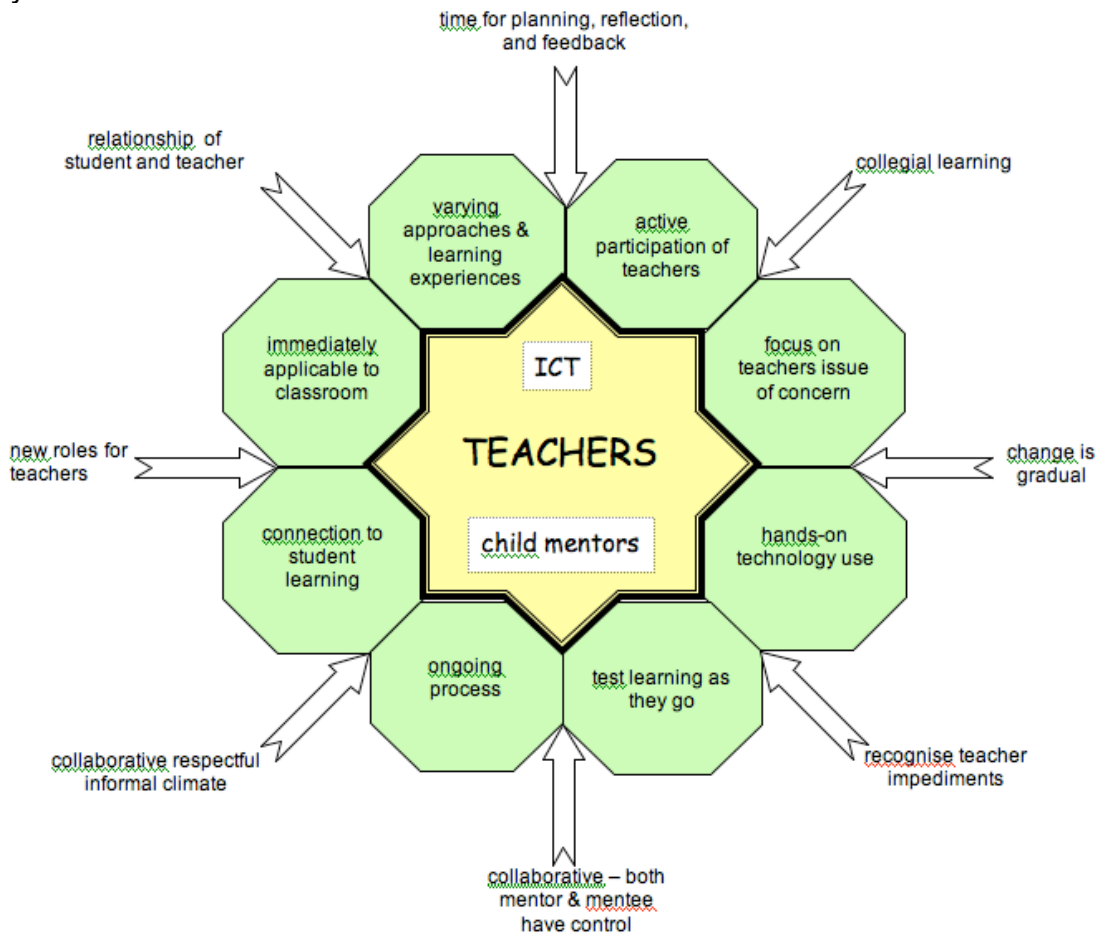

Figure 3. Model of professional learning for child to teacher mentoring.

Research Methods

Design of the study

The study focused on an innovative model of teacher professional development in ICT. The research was based on a pilot study, which showed the effectiveness of a different relationship between teachers and students in their teaching and learning of ICT. The study proposed a model where students in one class become proficient with a new piece of software or peripheral and they in turn act as mentors for the teachers in their school to develop their proficiency with the software.

Initially the children were exposed to the use of digital cameras and editing components of software by a school staff member and/or the researcher. Under their supervision, children explored the cameras and software until they had a working knowledge of the majority of facets of the cameras and software and some of their uses in education. This training was undertaken formally once a week over a term, but many informal sessions also occurred throughout normal classroom interaction. Intertwined with this camera and software exposure was focused discussion on what it means to be a mentor.

Data sources

Data were gathered from two schools in which a grade 3/4 class provided the mentors. In one school, the researcher prepared the children for their role. In the

other, a classroom teacher provided the input, with support and assistance from the researcher.

All teachers and students completed pre- and post-questionnaires, including items relating to background details and attitudes, including data encompassing teacher and student perception of their attitudes, knowledge and skills.

Data were collected through questionnaires using a 0 to 10 Likert scale, observation and interview. Interactions within the mentoring teams in three formal 20 to 30 minute mentoring sessions were observed and digitally recorded, supported by field notes. In addition to these sessions, teachers were encouraged to seek out their mentor/s when they had an issue with this specific camera or software, but also with technology in general. Teachers and children were encouraged to complete journals reflecting on their participation.

To gain data on the student's perceptions of the effect of the approach on the teachers, and also on their personal reflections on their experiences during the mentoring sessions, students were interviewed as a group between mentoring sessions and individually at the end of the series of three mentoring sessions.

Other main stakeholders in the school, such as the principal and project coordinator, were also interviewed. Anecdotal comments from parents were provided by principals, teachers and students.

Methods of analysis

The "three concurrent flows of activity: data reduction, data display and conclusion drawing/verification" (Miles & Huberman, 1994, p. 10), were used. Expert colleagues reviewed the coding and coded themes to validate the grouping and themes arising. Quantitative data were analysed using SPSS.
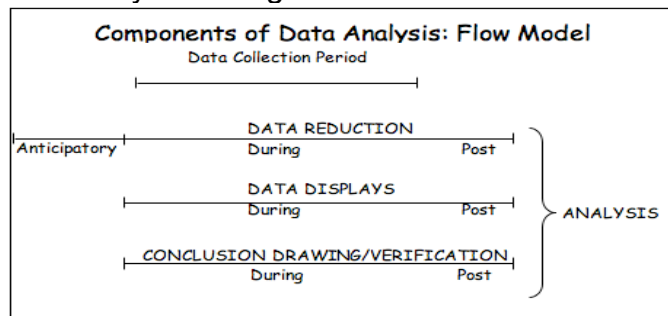
Figure 4. Data analysis components: Flow model. Miles and Huberman (1994, p.10).

Initial analysis of the qualitative data began with the sorting into coded themes using the developed mentoring model (Fig. 3) as a focus. The computer software *Nvivo* (Nvivo, 2005) assisted in this process. The use of the mentoring model for analysis became problematic, as it was the professional development model; it was not showing the depth of the data that developed through the mentoring sessions. To show this the observation schedule that was more specific than the overall professional development model was utilised. The headings for each category are listed in Figure 5. These categories provided a more helpful framework for data analysis.

Mentor (C=Child)	Mentee (T=Teacher)	Relationship between mentor & mentee
C1. Charactereristics	T1. self as a learner	R1. Good rapport between mentor and mentee
C2. Learning Environment [manner of interaction]	T2. relationships	R2. Trust and confidentiality
C3. Approach [How they teach]	T3. approach to project	R3. Clear objectives and goals
C4. Interaction–explanations [How they tell – content model]	T4. reactions with mentor	R4. Mutual respect
	T5. take control of learning	R5. Clear communication and feedback
C5. Interaction–discourse [How they encourage learning- foster interaction]	T6. persistence	R6. Physical environment comfortable
	T7. making choices	R7. Shared experience
C6. Planning	T8. approach [doing]	R8. Acknowledgment and celebration of achievements
C7. Management		R9. Others are aware and supportive
C8. Relationships between mentors		R10. Locus of Control

Figure 5. Observation Schedule Headings

Preliminary Results

Data analysis is still progressing but it is already clear that the teachers involved highly valued the assistance of student mentors in the development of their confidence, knowledge and skills with ICT and that effects on their classrooms have already been seen in the following areas: Teacher confidence when others are using ICT; Teacher use of cameras in class; Teacher confidence to try other forms of ICT; Teacher use of mentors within their own class and the school; The appropriateness of children teaching; Teacher view of the children and their capabilities; Teacher narrow vision of capable and not so capable children; Improvement in teacher/student relationships.

Improvement in teacher confidence, skills and knowledge
The improvement in teacher confidence is evident in both the quantitative and qualitative data, particularly for those teachers who rated themselves low on the scale to begin with. Teachers showed an increase of an average of 1.8 points on a Likert scale from 0 to 10, with one teacher showing a move from two to eight. Even more substantial were changes revealed by the qualitative data. Prior to the mentoring sessions, I observed and had incidental conversations with teachers regarding their confidence with technology, and although they had all used various ICT in their classrooms, many staff showed and talked of, anxiety with the continual expansion of ICT and their need to keep up with the children in their classes.
Teacher confidence has been evident in three main areas: Teacher confidence when others are using ICT; teacher use of cameras in class; and teacher confidence to try other forms of ICT.

Teacher confidence when others are using ICT
One teacher rated her confidence at 4 on a 0-10 scale before the mentoring sessions began and 6 after the series of three mentoring sessions. Her confidence was shown, not in her actually using the technology, but in the fact that she felt happier when others were using it, as she understood what they were doing and felt she was capable of doing it herself.

> I have gained some knowledge and some skills. We've [staff] been working with some photos for a special event that is happening at the end of the year and just incidentally we played with some yesterday and I thought, "Oh, this is good, I know what the computer is capable of doing". I wasn't actually doing it, I was watching someone but I was also building on what I'd learnt and I thought, "No, I can do that". So you know I felt confident

that I've learnt some skills that will be useful and they are. (Rebecca, interview, 06/12/2006)

Teacher use of cameras in class

With confidence on the use of cameras raising an average of 3.1 on a scale from 0 to 10, and three teachers changing their rating by 5 or more points, there were many comments on the use and potential use of cameras in the classroom. For some the ideas are just starting to arise. "Well, I think I will make more use of the camera. We started up a little garden and the two girls have been taking photos and I think I will use the camera all the time, [for] language activities etc" (Heather, interview, 06/09/2006). Some had started simple uses of the camera with children, as Rita explained:

> I just know enough to use it adequately in a simple situation, I can't do the wonderful things I know that you're able to do with it and that is something I would love to do, but I haven't done it yet … We did a beautiful Values PowerPoint and played some music and played the shots and that was something I wouldn't have done before the [mentoring] with the girls. (Interview, 20/10/2006)

For others, the actual use of the camera is becoming commonplace and they are actually assisting their students to use the technology. Josie was very excited to actually assist the students and for her that confirmed her improvement.

> I have gained confidence in using the technology. I have gained knowledge, well knowledge how to use it and then that's the confidence. I think it has enhanced my teaching in that it is certainly becoming more, just one more thing that you do use … So I think the fact that it is just now part of the learning … Mainly integrated studies, things like that for photos. We made a prayer in PowerPoint and we gathered all the cameras through the school and the kids went off and took photos and made their PowerPoints. Actually I sat with a couple and showed them how to download. It was very exciting. (Josie, interview, 30/10/2006)

Teacher confidence to try other forms of ICT

From the use of the cameras, some teachers have started to branch out and look at other technologies. The principal of one school was pleased to observe the integration of ICT. He stated that the teachers were driving the integration now.

> It's not me driving it. They can now see the value in it. They're pushing towards that not me… It's already happening a little bit with the digital video camera. You can see now, the teachers don't know how to use a video camera, but they know the children [do], so they've moved away from being the all knowledgeable one to being the facilitators and they know that, yes, we can build this technology into my class, not because I know how to use it, but because the kids are confident in how to use it. (Philip, interview, 30/10/2006)

Comments like this from a junior school teacher confirm this. She is now thinking about where to incorporate the cameras, and planning on further improvement: "Now I use the camera where I wouldn't before. So that has been a real plus. I am starting to incorporate it into other areas … I am hoping with practice it will get quicker and better" (Lesley, interview, 16/10/2006).

Teacher use of mentors within their own class and the school

Most teachers agreed that the mentoring model had possibilities for use in their classrooms, some stating it was already having an influence in their classroom. One teacher, Odette, was even team teaching with her mentor pair in her classroom on the use of the cameras. This teacher is continually discussing the possibility of further sessions for both the teacher and her class with the mentors' class teacher.

The appropriateness of children teaching

The use of the children in the mentoring process, particularly from Grades 3 and 4, was initially frowned upon by some. "Why didn't you use the grade sixes?" was a common question early in the research. In discussion with school administrators, I made the decision to use Grades 3 and 4 children as I was wary of preparing children that would move to new schools after only a year of the project resulting in their skills and knowledge being lost to the school. This came to be a wise decision as all staff commented that they were glad the children were not in Grade 6, as they wouldn't be able to access them next year. "The idea of using that middle school I found was great because I think getting to this stage of the year if it had of been Grade 6 I would be a bit panicky that I was losing my mentors" (Lesley, interview, 16/10/2006).

Many teachers commented that they hadn't realised the opportunities they had been missing out on in classrooms, utilising children as mentors. They realised it is fine for teachers to not be the all-knowing presence in the classroom.

> It makes it okay to ask a child to teach you … Sometimes you think if I ask a child to help me everyone will think I'm dumb, but if it's OK for a child to teach, if you make that the sort of the culture of the classroom, that it's okay to teach someone else, then I think that's valuable and it does change your thinking … I'm quite happy to ask someone to show me … it's hard to admit being an older person. You do have to admit you don't know a lot about computers sometimes and so you get the kids to show you but you might word it in a way that you know, I've forgotten how to do this, can you show me? (Rebecca, interview, 06/12/2006)

The idea of utilising all children became a focus in discussions about the classroom being a learning community where we all learn from each other. The mentor's classroom teacher was very happy to see that not only did the staff in the school gain from the sessions, but also the children learnt that the mentoring process actually worked, and that the teacher was not the font of all knowledge. She commented:

> They understand now when I say go over and ask that person or ask that person. But before sometimes I think they'd give me a bit of a look "oh you just don't want to show me" get somebody else. I would say "go and ask somebody else and then come back to me if you still don't know." And I have always done that and I think now they realise "oh that other person might know as much" or more than [teacher] … It doesn't have to be the teacher who has got the skill, you can ask anybody. (Angela, interview, 16/10/2006)

Teacher view of the children and their capabilities

It was interesting to see the recognition of the teachers of the capabilities of the students in their classrooms. All teachers commented on surprise that they felt at the confidence and skills the children showed in the implementation of the mentoring. One grade 5/6 teacher's comment summed up the staff feeling: "They've convinced me that there is nothing they don't know" (Teresa, interview, 06/09/2006). As will be evident in the following sections this became a common theme. This realisation was further developed in the teachers' insights into how narrow their vision was of the children in their schools.

Teachers' narrow vision of capable and not so capable children

One of the biggest surprises to teachers was the unexpected children who were excellent mentors. The coordinating teachers at both schools commented that they were very surprised by some children who shone in the role of mentors. As one stated:

> Kids like Denis, who probably aren't the strongest academically, all of a sudden has this role, has his place and that's made him feel a lot more confident in approach to a lot of his work. He feels like he's got a bit of a leadership place because he's all stuck in the lower end so all of a sudden "I can do this, I am showing teachers, I am showing Grade 3s, people are asking me to come and help them with things, [the principal] is asking me".

> So he's all of a sudden he got a real confidence boost which has affected his, just his whole demeanour … his self esteem. (Angela, interview, 16/10/2006)

When asked who she would not have picked to be a mentor if given the choice his classroom teacher was almost embarrassed to reply that this boy would be at the bottom of her list of choices. "I wouldn't know how much he would retain and be able to tell it back … When I look at it, that would have been a real pity from what he's got out of it" (Angela, interview, 16/10/2006). The principal also commented on the same child as least likely to be chosen.

> I know that for Denis in particular this has just been a real confidence boost because he has suddenly become an expert in his class in this area … it has been good and the kids have seen him as an expert, someone who they can go to and offer that support. So I think that has been really, really good for his whole self esteem and his confidence. (Philip, interview, 30/10/2006)

The teacher Denis mentored was most surprised of all.

> I actually was really impressed with how much Denis knew, because often last year he was a struggler, with his work, and it's nice to see there's always something good they can do and it was nice to see that quality and him be able to be confident in that way… I thought anyone can do it. It actually made me realise that anybody, any child within that room would probably have been very good… I remember when I heard who I was having, I thought "Ohhhh" … I wonder how it is going to go" and "I wonder how much he will know to share with me"… You know, with the right instruction even the slowest kid can feel proud about themselves and have something to share with somebody else. (Lesley, interview, 16/10/2006)

Similarly, at the other school, one boy stood out. His classroom teacher, the teacher he mentored and even his parents, all described him as a boy who had come a long way with the mentoring project: "Jeremy is one who has [had difficulties learning himself], and he is one of the kids whose parents have come in to say it has been amazing for him, and he is one of the kids who showed them, every week he would go home and show them something." (Elizabeth, interview, 25/08/2006). His mentee teacher has known him since he was five and "to see him, you know, to become a mentor was just overwhelming really for me, it was just because I had seen him struggle so much as a Prep, so it was overwhelming." (Moira, interview, 06/09/2006)

Improvement in teacher/student relationships
With all of this contact and these insights, the relationship between mentor and mentee was very likely to develop through this project. It has surfaced as the least expected, but most obvious factor in the data collected. As well as appreciating what they were learning, the teachers showed great interest in the children, and what this project and resulting relationship change had done for their skills, and confidence to impart those skills to adults. Teachers reported that although children seemed slightly apprehensive at first, once they realised that the teachers actually didn't know the information that they did, their confidence rose. One teacher spoke of her need to use the new skills because the children had taught her "I think now because they have shown me I feel, well I feel in a way, I feel, not obligated, like I feel as thought I should, I have to now use the camera and practise the skills that they taught me" (Roxanne, interview, 23/10/07).
Teachers noted the fun they could have in the sessions and it was obvious they felt comfortable with the children teaching them. They came up with a variety of reasons why professional development with children was more successful for them than professional development with adults. These included the following:
• Children did not expect prior knowledge;
• Children were patient;
• Children were encouraging;

- Children explained clearly and step by step and were not annoyed by teachers requiring further or repeated explanations;
- Teachers didn't feel 'threatened' as they did at adult sessions where they felt great inadequacies compared to peers.
- Children were available, and
- Teachers enjoyed the sessions and saw the children did too.

Every staff member saw positives in the relationship developments from the session with the children. There were no negative comments received regarding the relationships built. These quotes sum up the feeling of the staff as a whole: "I felt the children just very, very different, they're more open, they're more, I don't know, there's just not that same threat … I think they are prepared to go over and over things and they do it very differently to an adult who presumes you should know so much, where the children don't have the presumption" (Moira, interview, 6/09/07). "With an adult … I might be more reluctant to show my weaknesses" (Rebecca, interview, 6/12/07). "I think the mentoring works because a teacher can then say hey, "slow down you have gone too fast" or "this is the direction I want to lead" (Lesley, interview, 16/10/07).

Educational Importance

I believe that this research has significance for all facets of education and to society as a whole. It is clear from multiple studies (Butler, 2000; Char, 1989; Clements, 1999; Johnstone, 2003; Papert, 1993; Spender & Stewart, 2002) that the use of computers is advantageous to students' learning. Large amounts of money have been spent on ICT equipment and the professional development of teachers in the use of these technologies (Victorian Department of Education, 1998; Victorian Department of Education and Training, 2005).

This spending has occurred in a context where society at large is given the impression that schools today are teaching our students about and with technology, therefore justifying the spending. Society is given this impression because administrators talk in numbers. They may state that their school has a ratio of one computer to five students, but of course this does not necessarily mean that these computers are actually well utilised.

Tenbusch states "the biggest obstacle to the implementation of technology in education isn't the lack of hardware, but rather the fact that many teachers aren't ready to use computers in the classroom" (Tenbusch, 1998, p. 1).

This study has shown the benefits of changing the relationship between teachers and children in schools through encouraging them to become partners in learning. It has enabled teachers to gain the support they need with ICT so they are ready and able to use computers in the classroom. It has allowed both teachers and children to let go of the false assumption that teachers are the holders of all knowledge and allowed them to work together to develop the teachers ICT confidence, skills and knowledge so therefore to improve the uses of ICT in their classrooms. Added benefits of deeper teacher understanding of the children in their classroom and the broader school was an unexpected, but very welcome outcome.

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Benefits of children[1] as mentors in Australia: ICT, teachers & children

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Abstract

This doctoral study focuses on the development of an unusual relationship between teachers and their students. Nine- and ten-year old children are mentoring teachers in the development of their knowledge, skills and confidence in the use of ICT in their classrooms. Throughout the process, a range of benefits emerged including the development of confidence, skills and knowledge, enhanced relationships, and a range of "spin-offs" for both teachers and child mentors.

Keywords

Mentor, professional development, computers, classroom, relationships

While technology continues to influence practice in Australian schools, many teachers are still not comfortable with its use in their classrooms. This project explored the possibility of teachers becoming more confident with ICT in their classrooms by taking advantage of the knowledge and skills of children to mentor them in their learning of ICT. This process aimed to take the pressure off the ICT 'experts' in schools to allow them to focus on mentoring a group of children, who in turn took on the role of mentoring the school staff. The implementation of this mentoring model was studied in two different settings to determine the benefits and impediments to its success, and the effect it had on the knowledge, skills and confidence of the teachers involved, on teacher-student relationships, and subsequent impacts on classroom practice.

Theoretical Framework

In developing a framework for the study, Rodriguez & Knuth's (2000) model of effective professional development for technology was adapted, with elements of the coaching and mentoring strategies of Loucks-Horsley, Stiles and Hewson (1996).

The model in Figure 1 outlines the major factors that were relevant in the planning of the program. A key difference was that the facilitator was not a more experienced adult, but a child who had more relevant experience with ICT than the adult. The Loucks-Horsley et al. (1996) model of Workshops, Institutes, Courses and Seminars highlighted the fact that there must be opportunity for the learners to shape the sessions, time for reflection, prediction and exploration and a safe environment for experimentation. Teachers need to know that the professional learning in which they are participating impacts on their teaching, and, like children, they want to explore and experiment.

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[1] As the teachers are the 'students' in this project, the word 'children' has been used to describe the student mentors.

	Coaching and Mentoring
usually occurring	• both in & out of class
opportunities	• formal & structured
facilitators or leaders	• one- on-one • knowledge & skills of more experienced adult
time periods	• vary but ongoing
Learning goals addressed	• provide confidence and ability to improve practice
key elements	• focus on learning or improvement • mechanisms for sharing & feedback • opportunities for interaction
implementation requirements	• climate of trust, collegiality, continuous growth • long term commitment to interaction • skill building in coaching & mentoring • administrative support
must contain	• trust & sharing relationships to overcome norms of isolation & privacy • time to meet etc • approaches vary. choose one that suits.

Figure 1. Relevant strategies for professional learning

(adapted from Loucks-Horsley et al, 1998).

The components which Rodriguez and Knuth (2000) see as essential to effective professional development for technology in schools are shown in Figure 2.

Connection to Student Learning	Ongoing Process
Hands-On Technology Use	Sufficient Time
Variety of Learning Experiences.	Technical Assistance and Support
Curriculum-Specific Applications	Administrative Support
New Roles for Teachers	Adequate Resources
Collegial Learning	Continuous Funding
Active Participation of Teachers	Built-In Evaluation

Figure 2. Components of effective professional development for technology use

(Rodriguez and Knuth, 2000).

A key item not included in other models, but one that was crucial to the present study, was the relationship between the mentor and the mentee. The model I have developed for teacher professional development using children as mentors is outlined in Figure 3. This model structured the form of the program in the schools, and assisted development of observation checklists to guide data collection and analysis.
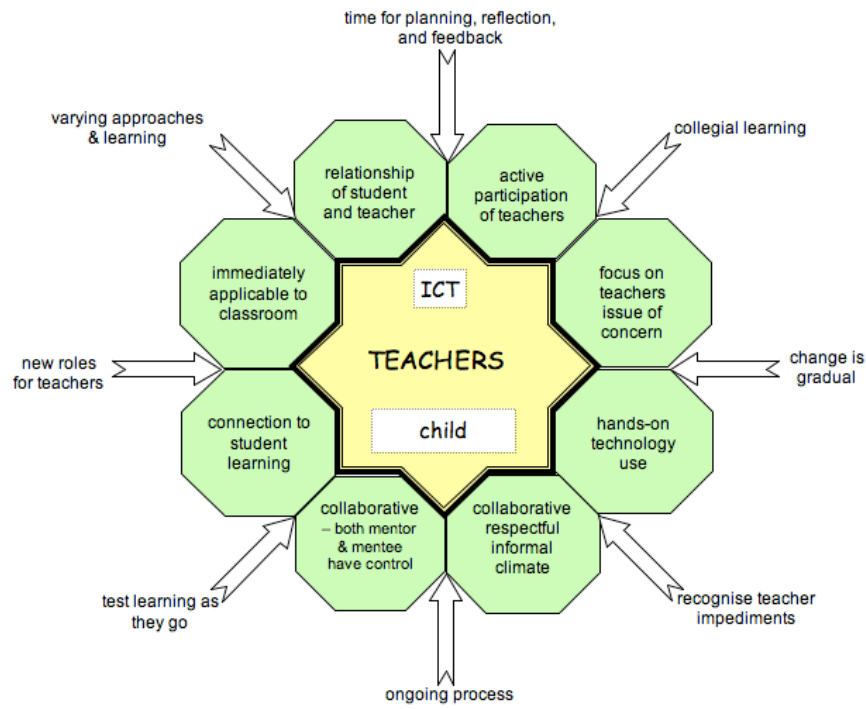
Figure 3. Model of professional learning for child to teacher mentoring.

Research Methods

Design of the study
The study focused on an innovative model of teacher professional development in ICT. The research was based on a pilot study, which showed the effectiveness of a different relationship between teachers and students in their teaching and learning of ICT. The study proposes a model where the children in one class become proficient with a new piece of software or peripheral and they in turn act as mentors for the teachers in their school to develop their proficiency with the software.

Initially the children were exposed to digital cameras and editing components of software by a school staff member and/or the researcher and, under their supervision, children explored the cameras and software until they had a working knowledge of the majority of facets of the cameras and software and some of its uses in education. This was undertaken formally once a week over a 10-week period, but many informal sessions also occurred during normal classroom interaction. Intertwined with this camera and software exposure was focused discussion with children on what it means to be a mentor.

Data sources
Data were gathered from two schools in which a grade 3/4 class provided the mentors. In one school, the researcher prepared the children for their role. In the other, a classroom teacher provided the input, with support and assistance from the researcher.

All teachers and children completed pre- and post-questionnaires, including background details and attitude type data, including data encompassing teacher and child perception of their attitudes, knowledge and skills.

Data were collected mainly through questionnaires, observation and interview. Interactions within the mentoring teams in three formal 20-30 minute mentoring

sessions were observed and digitally recorded supported by field notes. In addition to these sessions, teachers were encouraged to seek out their mentor/s when they had an issue with this specific camera or software, but also with technology in general. Teachers and children were encouraged to complete journals reflecting on their participation.

To gain data on the children's perceptions of the effect of the approach on the teachers, and also on their personal reflections of what the mentoring sessions meant to them, children were interviewed as a group between mentoring sessions and individually at the end of the series of three mentoring sessions.

The main stakeholders in the school, such as the principal and coordinator, were also interviewed.

Methods of analysis
Initial analysis of the qualitative data involved sorting data into coded themes using the developed mentoring model (Figure 3) and observation checklists as a focus. The computer software Nvivo (Nvivo, 2005) assisted in this process. Components of data analysis as described by Miles and Huberman's data analysis flow model (Figure 4) which shows "three concurrent flows of activity: data reduction, data display and conclusion drawing/verification," were used (p. 10). Expert colleagues were asked to review the coding and coded themes to validate the grouping and themes arising. Quantitative data were analysed using SPSS.
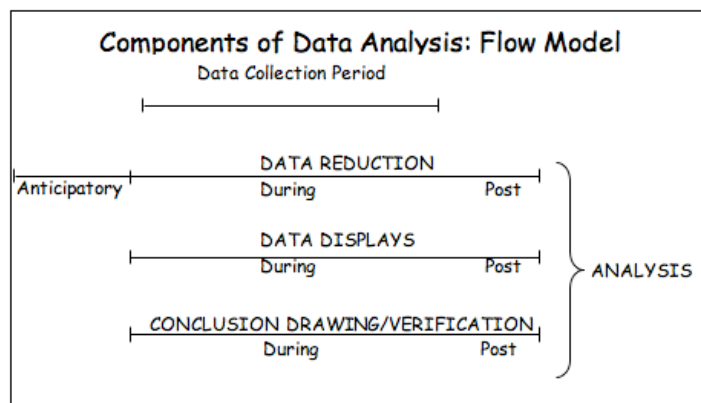

Figure 4. Data analysis components: Flow model. Miles and Huberman (1994, p.10).

Preliminary Results

Improvement in teacher/student relationships
The relationship between mentor and mentee as developed through this project, was by far the most prominent factor in the data collected. As well as appreciating what they were learning, the teachers showed great interest in the children, and what this project and resulting relationship change had done for their skills, and confidence to impart those skills to adults. Teachers reported that although children seemed slightly apprehensive at first, once they realised that the teachers actually didn't know the information that they did, their confidence rose. Some participants from both sides of the mentoring relationship actually questioned if it was a genuine situation, or if the teachers were pretending to know nothing to 'help' the children. As one grade 5/6 teacher stated: "I wasn't quite sure whether they were actually going to teach me something I didn't know, or whether it was a little test for them and what role I was supposed to be playing, and then I sort of realised, no I was learning things I didn't

know and they had knowledge they were sharing". Sharon, a Grade 4 child actually commented after the sessions that she had been nervous as she didn't think she could teach a teacher anything because "teachers knew everything".

Teachers noted the fun they could have in the sessions and it was obvious they felt comfortable with the children teaching them. They came up with a variety of reasons why professional development with children was more successful for them than professional development with adults. These included: Children did not expect prior knowledge; children were patient; children were encouraging; children explained clearly and step by step and were not annoyed by teachers requiring further or repeated explanations; teachers didn't feel 'threatened' as they did at adult sessions where they felt great inadequacies compared to peers; children were available; and teachers enjoyed the sessions and saw the children did also.

Data analysis is still progressing but preliminary findings show that teachers involved highly valued the assistance of children as mentors in the development of their confidence, knowledge and skills with ICT and that effects on their classrooms have already been seen in the following areas:

Improvement in teacher confidence, skills and knowledge
The improvement in teacher confidence is evident in both the quantitative and qualitative data – particularly for those teachers who rated themselves low on the scale to begin with. Teachers showed an increase of an average of 2.4 points a Likert 1-10 scale with one teacher showing a move from two to eight. Even more substantial were changes revealed by the qualitative data. Prior to the mentoring sessions, I observed and had incidental conversations with teachers regarding their confidence with technology, and although they had all used various ICT in their classrooms, many staff showed and talked of, anxiety with the continual expansion of ICT and their need to keep up with the children. Before the second mentoring session one teacher stated " I feel confident using the camera now – but I want to focus on how to use these photos in Word". Commenting in her journal after the second session on what she had learnt she said, "I think it will be very beneficial in the future". Since the session this teacher has used those items in her classroom with the support of her mentors.

Teacher confidence has been evident in three main areas: Teacher confidence when others are using ICT, Teacher use of cameras in class and teacher confidence to have-a-go.

• Teacher confidence when others are using ICT
One teacher's confidence was not shown in the actual use of the technology, but in the fact that she felt happier when others were using it, as she understood what they were doing and felt she was capable of doing it herself. "I have gained some knowledge and some skills. We've [staff] been working with some photos for a special event that is happening at the end of the year and just incidentally we played with some yesterday and I thought, "Oh, this is good, I know what the computer is capable of doing". I wasn't actually doing it, I was watching someone but I was also building on what I'd learnt and I thought, "No, I can do that". So you know I felt confident that I've learnt some skills that will be useful and they are." (Rebecca[2])

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[2] Pseudonyms have been used for teachers and children involved in this project.

- Teacher use of cameras in class (scales on use from survey)

Many teachers commented on future use of the cameras in their classroom. For some the ideas were just starting to arise. "I think I will make more use of the camera. We started up a little garden and the two girls have been taking photos and I think I will use the camera all the time, yeah, you know language activities etc." (Heather)

Others had started simple uses of the camera with children as another teacher explained: "I just know enough to use it adequately in a simple situation, I can't do the wonderful things I know that you're able to do with it and that is something I would love to do, but I haven't done it yet… We did a beautiful Values PowerPoint and played some music and played the shots and that was something I wouldn't have done before the thing [mentoring] with the girls." (Rita)

For others, actual use of the camera is becoming commonplace and they are actually assisting the children in their class to use the technology. Josie, a grade 6 teacher, is seeing cameras as another tool in the classroom and was very excited to assist the children in her class in the use of the camera:

> "I have gained confidence in using the technology. I have gained knowledge, well knowledge how to use it and then that's the confidence. I think it has enhanced my teaching in that it is certainly becoming more, just one more thing that you do use, whereas it used to be a bit of a "Wow, I've got the camera", now it's just like, We are doing things at the moment and the kids, one group is using a camera, one is going to use a video and ones going to, There are all sorts of things going on but they just know the options are there and they just, So I think the fact that it is just now part of the learning… Mainly integrated studies, things like that for photos. We did a PowerPoint for, we made a prayer in PowerPoint and we gathered all the cameras through the school and the kids went off and took photos and made their PowerPoint, but they knew, Actually I sat with a couple and showed them how to download. It was very exciting."

- Teacher confidence to try other forms of ICT

Some staff felt a feeling of obligation to use the technology, so as not to let the children down. Roxanne commented: "I think now because they have shown me I feel, not obligated, I feel as thought I should, I have to now use the camera and practise the skills that they taught me."

From the use of the cameras, some teachers have started to branch out and look at other technologies. The principal of one school was very pleased to comment on the integration of ICT. He stated that the teachers are

> "Driving that now, it's not me driving it. They can now see the value in it. They're the pushing towards that not me… It's already happening a little bit with the digital video camera. You can see now, the teachers don't know how to use a video camera, but they know the children [do], so they've moved away from being the all knowledgeable one to being the facilitators and they know that, yes, we can build this technology into my class, not because I know how to use it, but because the kids are confident in how to use it, so we are simply setting up that learning experience for the kids, which is what you want."

Comments from the staff supported this principal statement: "Yeah I think after we go on our excursion we could go over all those things and cropping the photos we want and I will use them then." Alison

> "Now I use the camera where I wouldn't before. So that has been a real plus. I am starting to incorporate it into other areas. It is still labour intensive though, it's not coming easily to me so I am hoping with practice it will get quicker and better and I think need to stop panicking too much about getting the cropping perfect and stuff like that because kids in Prep [first year of schooling] sort of need everything immediately. It's no use

having a photo and then using it a week later because by then you have lost the potential that the photo would have had." Lesley

"I think I'm more inclined now, I want to use it more in the classroom, incorporate it a bit more and we were going to use it in our literacy groups too, and I'd like to learn to use the video, but it's sort of a start, like it's one step at a time so, just incorporate it more across the curriculum rather than just when something interesting happens." Roxanne

Insights into the children in the mentoring group

• Teacher use of mentors within their own class and the school

Most teachers agreed that the mentoring model had possibilities for use in their classrooms, some stating it was already having an influence in their classroom, with one teacher even team teaching with her mentor pair in her classroom on the use of the cameras. This teacher is continually discussing the possibility of further sessions for both the teacher and her class with the mentors' class teacher.

• The appropriateness of children teaching

The use of the children, particularly from grades three and four, was initially frowned on by some. In planning the research, I made the decision to use Grade 3 and 4 children as I was wary of preparing children that would move to new schools after only a year of the project, taking with them their skills and knowledge. One Grade 5/6 teacher spoke about this hesitancy to use younger children: "I wasn't quite sure of the idea of the younger kids being the mentors, usually, you know, so used to the Grade 6 doing everything. But now that I see how well, particularly the two I had, handled it and the fact that they are still in the school for a few years and to teach others, I think that is the key to its success." The choice of younger children was really a bonus as all staff commented that they were glad the children were not in grade six as they wouldn't be able to access them next year. This comment form one junior school teacher was typical: "The idea of using that middle school I found was great because I think getting to this stage of the year if it had of been grade 6 I would be a bit panicky that I was losing my mentors."

Many teachers in the project were already utilising the talents of children in their classrooms in a range of ways, but for some this was a totally new idea. This grade 3/4 teacher's comment is very interesting as it shows the awareness of utilising the children, but also the reticence to say I don't know that many teachers still feel. The loss of control:

"It makes it okay to ask a child to teach you. It sort of, sometimes you think if I ask a child to help me everyone will think I'm dumb, but if it's OK for a child to teach, if you make that the sort of the culture of the classroom, that it's okay to teach someone else, then I think that's valuable and it does change your thinking, you know I'm quite happy to ask someone to show me and it's hard to admit and being an older person you do have to admit you don't know a lot about computers sometimes and so you say get the kids to show you but you might word it in a way that you know, I've forgotten how to do this, can you show me? So, I'm still prepared for children to, you know, I'd be quite happy for them to show me what they know sometimes."

It was also interesting to note that the classroom teacher of the mentor group at one school felt that her whole class had gained the knowledge that is was alright to ask another child for assistance, because if they can help teachers, they must have something to offer. Angela commented on the children's new awareness of the classroom as a learning community:

> "I think they'd probably be happier, well not happier but they understand now when I say go over and ask that person or ask that person. But before sometimes I think they'd give me a bit of a look "oh you just don't want to show me" get somebody else. I would say go and ask somebody else and then come back to me if you still don't know. And I have always done that and I think now they realise "oh that other person might know as much" or more than Mrs S. Or more of an issue if it's okay to learn from somebody else whereas before it would be a bit of "Oh she told me to go and ask somebody else" without really realising, so I think that's good. It doesn't have to be the teacher who has got the skill, you can ask anybody."

- Teacher view of the children and what they are capable of

It was not only the children's view of each other that changed. Teachers too realised throughout the project that the children were much more capable, in a broad range of areas, than they thought. All teachers commented on the amazement they felt at the confidence and skills the children showed in the implementation of the mentoring. This Grade 5/6 teacher's comment sums up the overall feeling of teachers: "They've convinced me that there is nothing they don't know."

- Teacher narrow vision of 'not so capable' children

As well as realising the capability of the group of children as a whole, widely discussed in each school was one unexpected child who had shone in this mentoring role. Both the classroom teacher and the mentored teachers chose the same person when asked, "If I asked you to choose a group of mentors from this group, who would have been last on the list?" In both schools the children were boys, who were considered very weak at their academic work.

In school one, the boy, Jeremy, mentored the teacher who had taught him in his first year of school. She described him as "a little boy who had started off with learning, a slow learner, because of other medical things and because he had been born very premature child. So his learning had to be very slow and very methodical." I did not know Jeremy's background, and thought of him as capable as any other child, and when I heard Moira comment, I thought he had come a long way, but when I opened Jeremy's journal I was astounded and realised that he still had some learning issues. I actually had to get the classroom teacher to translate a lot of his early writing. She agreed in that "Jeremy is one who has [learning difficulties]".

Jeremy's classroom teacher was really happy with his progress throughout the mentoring project and felt there had been a real change in him, Even his parents commented on the effect it had on him. "He is one of the kids whose parents have come in to say it has been amazing for him, and he is one of the kids who showed them, every week he would go home and show them something." She noted specifics in her journal: "Jeremy's parents also commented on how enthusiastic Jeremy is about the program. He was able to show his parents how to crop, cut and draw on a photo using the Paint feature on their computer." In her interview and journal, Elizabeth also told of how Moira had talked to her of Jeremy. She commented on how he "was able to relay the information succinctly and confidently" and how when he "spoke, his confidence, he looked you in the face and his ability to just go yes, yes I know that and he notices what she'd be doing and she has asked him four or five times now to come and help, download photos." Moira was Jeremy's biggest fan:

> "to see him become a mentor was just overwhelming really for me, it was just because I had seen him struggle so much as a Prep, so it was overwhelming." Just to see how far they have come and the confidence they seem to have gained, especially Jeremy and John who are very, very quiet little children… in Jeremy I just saw the confidence … they [the other mentors] let Jeremy sort of take over a bit… and Jeremy is very methodical as

> well. With Jeremy it was just the confidence, the confidence to actually guide someone else."

In school two the boy, Denis, mentored the teacher who had taught him the previous year. Lesley was originally apprehensive: "I remember when I heard who I was having, I thought "Ohhhh", oh no I shouldn't" I wonder how it is going to go" and "I wonder how much he will know to share with me". His classroom teacher agreed: "I wouldn't know how much he would retain and be able to tell it back … not the strongest academically". Both were equally surprised by his capable participation in the mentoring role. Lesley commented that she was "really impressed with how much Denis knew, because often last year he was a struggler, with his work, and it's nice to see there's always something good they can do and it was nice to see that quality and him able to be confident in that way".

Denis has now become a leader in the school for technology. He is admired in the classroom as someone who has a lot to offer in this area and is often asked to assist the principal with technology needs that arise. All staff noticed the change in the confidence and self-esteem in this boy. His classroom teacher commented that "It made him feel I think a lot more confident in approach to a lot of his work… all of a sudden 'I can do this, I am showing teachers, I am showing Grade 3s, people are asking me to come and help them with things, the principals asking me'. So he's all of a sudden got a real confidence boost. Which has affected his, just his whole demeanour, he's just more, I don't know, I think his self esteem, yes, it's really good." Even the principal commented specifically on Denis: "I know that for Denis in particular this has just been a real confidence boost because he has suddenly become an expert in his class in this area … it has been good and the kids have seen him as an expert, someone who they can go to and offer that support. So I think that has been really, really good for his whole self esteem and his confidence … as a result he has just blossomed."

It also made Lesley realise that "anyone can do it. It actually made me realise that anybody, any child within that room would probably have been very good … you know, with the right instruction even the slowest kid can feel proud about themselves and have something to share with somebody else … it was an eye opener for me to think any child could do this now."

In regard to the children who unexpectedly shone across both schools, teachers concurred with one teacher's when they stated that "it that would have been a real pity [if he wasn't involved] from what he's got out of it."

Educational Importance

This research is highly significant for all facets of education and to society as a whole. It is obvious from multiple studies (Butler, 2000; Char, 1989; Clements, 1999; Johnstone, 2003; Papert, 1993; Spender & Stewart, 2002) that the use of computers is advantageous to students' learning. Large amounts of money have been spent on ICT equipment and the professional development of teachers in the use of these technologies (Department of Education, 1998; Department of Education and Training, 2005). This spending has occurred in a context where society at large is given the impression that schools today are teaching our students about and with technology, therefore justifying the spending. Society is given this impression because administrators talk in numbers. They state that their school has a ratio of one computer per five children and this gives the often false impression that the computers are actually well utilised.

Tenbusch (1998) states: "The biggest obstacle to the implementation of technology in education isn't the lack of hardware, but rather the fact that many teachers aren't ready to use computers in the classroom" (p. 1). This study has shown that teachers are ready to use computers in the classroom, given the right opportunity and support, support that until now has been time consuming and expensive. This project has shown that support can be provided by changing the relationship between teachers and children in schools, thus allowing them to become partners in learning. This study has utilised the children in the school and both teachers and children have benefited in a multitude of ways, beyond those that were first imagined.

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CHILDREN MENTORING TEACHERS IN THE USE OF ICT
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This new initiative in the Information and Communication Technologies (ICT) professional development of teachers was trialled in 2004 at a primary school in Melbourne. The initiative is part of a Pilot Study for my Doctorate and the results have encouraged me to share the project with others and explore this mentoring method of professional development further.

For many years schools have encouraged staff to develop into confident and competent users of ICT, but many staff still feel that the students know more about computers than they do. When I asked a school to trial this new initiative the teachers were keen to have a go, though some staff were sceptical.

> "I wasn't really negative in the beginning but I was wondering whether it would be a success. After going through the process I do believe it has been quite successful and I think it's been successful for everyone, children and teachers" (Cate).

This initiative calls for teachers, and students, to think differently about their teaching/learning relationship and to look more to each other as partners in their education. This is not traditionally how the student/teacher relationship is viewed, but once the sessions began everyone benefited from this mentoring relationship.

The Process
A grade five class of students and all available teachers in the school were involved. Initially, I introduced the software package *Inspiration* to the students and we spent four sessions of one and a quarter hours exploring the package and discussing how it could be used in classrooms throughout the school. We also spent one session exploring the concept of mentors and how this could work in our situation. A further two sessions were spent consolidating and preparing for the mentoring sessions.

Once the children were 'prepared' the mentoring sessions began. The children and teachers were asked to attend two before school sessions of 45 minutes each, one week apart. This took the place of a regular staff meeting time. In a computer lab, one child spoke for a few minutes on what we were about to embark on, and then each teacher moved to a computer, with their two assigned mentors.

The children had decided to brainstorm the topic 'Olympics' with the teachers and had a list of items they wanted to explore within the program over the two sessions. There was a buzz around the room for the whole session and both teachers and students were obviously engaged. It was clear to see that when the time came to stop most were not keen to do so. After the session the teachers returned to their class, all with positive comments about the experience. I stayed with the mentors to debrief.

I had noticed the children visibly relax just a couple of minutes into the session and their comments afterwards showed that although they were anxious prior to beginning, they realised they were actually capable of the task. Their feelings were often of relief but overwhelmingly positive.

nervous but soon relaxed

"It felt good to actually get it over and done with. I was nervous at the start but now because I know I've done one lesson and it was not as bad as I thought it was gunna be. [I thought] I'd just like forget everything" (Rick).

"It was good to get it over and done with because you know what you're going to do next week … the first lesson wasn't as scary as I thought" (Rick),.

thinking of the process

aware of change in relationship

"I felt kind of nervous at the start knowing that you were going to have to teach a teacher and you might stuff up or something" (Milly).

"I was really nervous because I might sound mean to the teachers and disappoint them or something and it didn't happen and I was happy about that" (Gemma).

considered feelings

The teachers too were very happy with the sessions and compared them favourably to other professional development they had attended. The following comments by teachers show that they felt very comfortable with the children's mentoring style:

no pressure

"It enhanced it [my learning] because there was no pressure. Sometimes when you've got adults teaching you things there is this pressure to know exactly what you are doing and with the children teaching you that pressure was taken away because they put it into their steps …kids just have a simple way of explaining things sometimes" (Nerida).

explained simply

no expectations

"Whereas kids seem to have that acceptance and they don't really care if you know it or not." (Cate)

cater to learning needs

"The girls were really good and very patient so I could say oh hang on, how do you do that again". (Clare)

slow moving

"We were moving more slowly and that is good. Shorter periods of time, learn something, in much the same way as we teach … more likely to remember" (Jenny).

step by step

"Step by step instruction was good for me." (Maggie)

Overall the pilot study was a positive experience for both students and teachers and encourages me to delve further into a model for students sharing their expertise in technology as mentors for teachers. Both teachers and students responded favourably to the mentoring sessions and were happy to continue. I have seen improvement in both teacher skills and confidence with technology, particularly the program *Inspiration*. I have also seen a change in the children involved. Their initial tentativeness was quickly replaced by confidence and a willingness to help others with technology. This project has definitely given me the confidence to explore this mentoring model further.

CHILDREN[1] MENTORING TEACHERS IN ICT: DOES IT WORK?

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ABSTRACT

For many years schools have attempted to develop staff into confident and competent users of Information and Communication Technologies (ICT), yet many teachers still sense that their students know more about ICT than they do. Can the children's confidence and experience be used to the advantage of both learners and the teachers?

This paper reports on a research project that investigates the value of a different relationship between teachers and students in the teaching and learning of ICT. The study proposes a new model for teacher professional development where the children act as mentors assisting to develop the teacher's confidence, knowledge and skills in ICT.

Initially, children were introduced to a new piece of software by the researcher and, under the researcher's supervision, they explored the software until they had a working knowledge of the program. The collaboration between teacher and student began with a session at which one child introduced the software to the teachers as a group and then children, in pairs, assisted the staff in their exploration. Over two 45-minute sessions strong bonds were formed between teachers and children and some productive working relationships developed. Teachers were then encouraged to seek out their child mentor/s whenever they had any issue with technology.

In this paper observations of both teachers and children in this mentoring partnership are discussed. Data from the project, including both teacher and student journals, revealed positive changes in the attitudes and confidence of both teachers and children.

1. INTRODUCTION

> I literally panicked at the thought of a brand new program and 'showing' my ignorance. I do get stressed about my lack of knowledge in front of other staff members. (Jenny)[2]

This paper outlines a research project in which children in a primary school setting mentored their teachers in the use of Information and Communication Technologies (ICT). It was anticipated that a mentoring relationship would develop, that would be valuable primarily for the teachers and as a consequence for the integration of ICT into the classroom. The research question was 'Can teachers gain confidence and skills in the use of ICT with assistance from children?'

1.1 Do we need student mentors?

I arrived at the question after many years of observing the education system from the perspective of a parent, teacher and provider of professional development. Since returning to study in 1993 and developing my skills and knowledge with computers and their uses in schools, I became more and more aware that although there were many computers in schools and a range of professional development offered to teachers, there was not a proportionate amount of computer use in classrooms. Others have highlighted this since:

> There is an ironic and costly contradiction in the attempt to integrate technology into education. While evidence of the educational benefits of technology abounds and investment in hardware and software has dramatically increased, relatively few teachers use technology regularly in their teaching and the impact of computers on existing curricula is still very limited. (Zhao and Cziko, 2001, p. 1)

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[1] As the teachers are the 'students' in this project, the word 'children' has been used to describe the student mentors.
[2] Pseudonyms have been used for teachers and children involved in this project.

During this time I have also been amazed at the skills and knowledge young children have with computers. I came to believe strongly that we can utilise these skills in our schools. We need to allay frustrations and utilise the resources provided to give maximum educational benefit to our children.

As "most teaching staff are 'digital immigrants' not having grown up with technology … yet the students are 'digital natives' having grown up with technology always having been a part of their lives" (Cookson, 2004, p. 10), I thought teachers needed to be encouraged to seek help, at the time they needed it, and at a level they could use it. As McKenzie (2001) stated, "some schools are discovering that the kinds of training programs offered in the past may not represent the most generative method of reaching a full range of teachers and their students" (p. 1). Knowing it is not every schools priority to have a full time staff member dedicated to assisting teachers with the integration of computers into their classrooms, I decided that the next best option was to use the most under utilised resource in schools today; the children. Why not have the children teach and mentor the teachers in ICT. Children have grown up in a 'wired world', their computer proficiency often acquired through years of 'technoplay' with *Nintendo*, *Sega*, *XBox* and games on personal computers. Children also have the benefit of "malleable neurological pathways that allow their minds to acquire new skills more quickly" (Tenbusch, 1998, p. 1). Children have been raised in the computer age and are naturally inquisitive. Why not use that to assist the teachers in building their confidence and skills with technology. The children should be able to assist the teachers in how to use particular softwares. The classroom pedagogy will then be up to the teachers to think about and discuss with colleagues. The hope is that once the teachers have gained confidence and skills in the use of technology they will feel more confident to build effective learning environments with ICT.

Our school and system administration have recognised the importance of teachers gaining confidence and skills in the use of ICT. In Australia, the Education System, including governments and individual schools have spent a large portion of their budgets setting up computer labs, computer pods and individual computers in classrooms. In the 1998 document *Learning Technologies in Victorian Schools* a range of existing and new initiatives was listed (Department of Education, 1998). These include hardware purchases, the state-wide software licensing fund, Internet access, print and electronic resources, Navigator Schools Project and teacher professional development. Add to this the rollout of the Notebooks for Teachers and Principals Project (Department of Education and Training, 2002) program which began in 1998 and have considerable evidence of the extent of funds tied up in technology in schools. Still, many teachers are not using the facilities for their teaching or the students' learning. Cookson (2004) discussed barriers to broader uses of computers in his study of attitudes and perceptions of Australian educators towards the use of educational technology:

> One of the key barriers to broader use of Educational Technology in schools is the low technology skill level of teachers. Some respondents commented that this situation had improved with the introduction of the (Victorian Education Department) Teacher Laptop Program. However many teachers still have a fear of technology. (p. 10)

If the staff use of the facilities provided is effective it will benefit themselves, children and the system as a whole. Once using technology wisely, the teachers should notice the time benefits to both themselves and the children. They may also need to come to the reality that the digital age is well and truly upon us and they need to keep in touch or they will find themselves slipping further and further behind current developments.

In classrooms across Victoria, I have seen children assisting each other in a variety of curriculum and non-curriculum based activities. We encourage children to work together and learn from each other. Of course many of us have started the process by asking children in our classes to "help me with this on the computer" but this, from my observations quickly becomes, "do this for me", not "show me how". I have also seen teachers utilise the skills and knowledge of their children to assist them and other children with ICT so I decided to formalise the process, and study its effects.

2. THE RESEARCH PROJECT

2.1 Overview
In this project, all children in one Grade 5 class were introduced to the process of mentoring and to a piece of software, namely *Inspiration*. The children then mentored nine teachers in their school in the acquisition of skills and confidence in using this software.

2.2 Participants
This project took place in a small primary school in a middle class area, with the vast majority of students from English speaking backgrounds. I chose to work with a class of grade five children. This level was deliberately chosen as it offered a high level of ability with the possibility of two years research, as Grade Six is the final year of primary schooling in Victoria. The class had eight male and nine female children and there were nine teachers willing and

available to participate. The staff participants were seven classroom teachers, one of whom was male and two specialists (Literacy Coordinator and Special Assistance).

3   PROCESS AND DATA COLLECTION

The data collection began with a pre-survey for all staff and children participating. The survey collected data on the actual computing facilities available at the school and at home, the participants' attitude to, and confidence with computers and the participants' opinion of their computing abilities, self rated on a one to ten scale, with ten being the high score, across a variety of areas ranging from general computer use to specific use of programs such as *Microsoft Word*.

The initial teacher survey showed that all teachers had a computer with Internet access at home for the duration of the project. The teachers all used computers in their classrooms. This ranged from a few times a term to weekly as shown in Table 1.

Table 1
Reported Frequency of Teacher Use of Computers in Their Classroom.

n=9 a.	frequency
never	0
a few times a term	2
weekly	6
greater than twice a week	1
daily	0

None of the teachers used a computer daily in their classroom. Teachers responded across the range of four to ten when asked to rate their confidence with computers. The rating of their overall computer skills fell between four and eight with two third of the teachers rating themselves at five or below. More than half of the teachers when asked their willingness to try something new on the computer, rated themselves at ten with all others at six or above. This painted a clear picture of teachers keen on learning more about computers and using them in their classrooms but not necessarily confident with their skills to use computers.

The student survey data showed that all children in the class had a computer at home for the duration of the project and all except one child had access at home to the Internet. The frequency of children using computers in their classroom differed from daily to a few times a term as shown in Table 1 but the majority were in agreement that they used the school computer lab weekly. Frequency of use at home varied widely from a few times a term, but an average of 62% of children across the pre and post surveys used the computer more than twice a week, and almost a third of the class used the computer daily.

Table 2
Student Survey Results on Frequency of Computer Use.

	classroom		lab		home	
n=17	pre	post	pre	post	pre	post
never	0	0	0	0	0	0
few times/term	8	7	3	1	5	5
weekly	5	4	14	15	2	1
more than twice/week	4	4	0	0	5	6
daily	0	1	0	0	5	5

The nature of the use of computers also varied but children certainly used a wider range of applications at home than they did in the classroom. All children with Internet access at home used the Internet regularly for email, online chat (MSN) and research.

3.1 Preparing the children to be mentors

Once the surveys were completed, I prepared the children to be mentors. This preparation consisted of skilling the children in two main items, firstly in the use of *Inspiration*, the program we used as a vehicle for the mentoring, and secondly in the role of mentor. This mentoring role with adults was one the children had not previously participated in formally, so it needed to be explained to them.

I met with the children in the school computer laboratory and introduced them to the program *Inspiration*. We spent one afternoon each week exploring the program (three sessions), discussing how it could be used in the classroom (one session) and the concept of mentoring (one session) and a further two weeks consolidating and preparing for the mentoring sessions.

3.2 Mentoring sessions

The children then worked with the teachers, mentoring them in the use of *Inspiration*. These sessions took place initially before school as a whole group in the computer laboratory for 45 minutes (once a week for two weeks). The format of the sessions was a quick introduction to the whole group, then the teachers moved onto a computer with their mentor/s for the rest of the session.

I had decided that I wanted the children to do all of the teaching, so we discussed what needed to be said to introduce the sessions to the teachers, as a whole, before they broke off into mentor teams. It was decided that one student would welcome the teachers and tell them that the children had been exploring a new program on the computers called *Inspiration* and that they would like to share what they had discovered with them. The child chosen by the class to introduce the session prepared, with me, the following statement that he made to the teachers.

> Inspiration is a piece of software that helps you develop ideas and organise thinking. It lets us create maps of ideas that we can see. Mrs. Gronn told us these are called visual maps. They are easier to remember because we can picture them in our minds. In Inspiration we can organise our ideas to help make the picture clearer. We don't know everything there is to know about Inspiration but what we do know, we would like to share with you and we hope we can then explore Inspiration further together.

The class and I also decided that a great way to introduce *Inspiration* to the teachers was through the topic of Olympics. The Olympics were being held during the next term in the year 2004 and all classes would be discussing them in one way or another, so the children decided they would brainstorm the Olympics with the teachers.

Children and teachers were then encouraged to meet in their own time during the next week to continue the mentoring sessions. This was difficult for some, as teachers were very busy in their release time from classes completing reports, but those who had the individual mentoring session had interesting comments to make. At the request of the teachers, after a break of two weeks for school holidays, we had one further group session and some further individual sessions.

Throughout the information and mentoring sessions the children kept written diaries of their thoughts and activities in small notebooks provided. These were approached in quite a rushed way and the children's responses were quite shallow compared to what they had to say in the interviews. Teachers also kept diaries (electronic) during the mentoring time. These should probably have been in hardcopy format as the teachers did not always have instant access to a computer to record a comment, so often no comment was made.

After each mentoring session I spoke to the children both individually and as a whole group about their feelings and thoughts on the sessions. The children were very open with their comments and this was the major source of the data from the children.

Staff interviews where completed after the initial pair of mentoring sessions. I audio taped interviews with all staff. These interviews were the most valuable pieces of data from the project. The teachers commented on a range of items from their feelings of anxiousness to their new confidence. They also spoke of their realisation and amazement at what the children could offer. These are discussed further in the results section.

At the conclusion of the twelve weeks, all children and teachers involved completed a post-survey, an exact replica of the pre-survey. The initial part of the survey on the computing facilities available to the participants hardly changed. The section on participants' attitude and confidence with computers and the participants opinion of their computing abilities showed some changes, which will be discussed in the results section.

4. RESULTS AND DISCUSSION

This project revealed teacher issues ranging from teacher professional development, their relationships with technology to their relationships with students. All of the teachers showed initial interest in the idea of student mentors for computers though some had doubts the process would work. As one teacher said: "I wasn't really negative in the beginning but I was wondering whether it would be a success. After going through the process I do believe it has been quite successful and I think it's been successful for everyone, children and teachers" (Cate).

4.1 Teacher confidence and skills

The main change in the teachers, on a rating scale of 1-10, was in their perception of their confidence and skill with computers and particularly *Inspiration*. In general computer usage, over half of the participants recorded a change of one or two points in both their confidence and skills. Notably all improvement came from those who saw themselves as less confident and less skilled initially. Prior to the mentoring, there were four teachers who rated their confidence below six, but at the conclusion of the project there was only one teacher who rated herself below six and she had been able to attend only two of the sessions. Even more noticeable was the amount of teachers who rated their skills at below six. This moved from six teachers prior to the mentoring to two teachers after. Comparing the pre and post-test results, five of the nine teachers felt they had seen an improvement in both confidence and skills. With particular reference to *Inspiration* the teachers all saw a change in their level of ability ranging from one to seven as shown in Table 1. I find this significant remembering the small scale of the research and the short time frame of only twelve weeks.

Table 3
Teacher Change in Ability to Use Inspiration From Pre to Post Test.

Amount of change	Frequency (n=9)
+ 1	1
+ 2	2
+ 3	2
+ 4	0
+ 5	3
+ 6	0
+ 7	1

4.2 Teacher realisations

Although most teachers were enthusiastic prior to beginning the project there was one teacher, the teacher of the grade of mentors, who was particularly nervous. She admitted she knew very little about computers and that she felt the children were missing out because she was not confident to use computers with them. After the first session with the children she was very excited. She showed a sudden realisation that technology was more user friendly than she had previously thought and that the children may be able to assist her in other areas of technology. After the first session she said: "I'm just thinking what other computer things the children can show me. I could ask some of them to show the class a different thing each week" (Jenny). This same teacher, in collaboration with another teacher set up a mentoring situation with her Grade Five mentors and the Grade Four class so they could pass on their knowledge about the new program to the other students. Both teachers reported that the session with the two classes was very successful and the children loved being taught by the other children.

Many of the teachers commented in their interviews that they knew mentoring was useful but had not really thought about using it in the classroom. One teacher stated: "It's the first time I've had children be a mentor. I can see now it's a good thing. I will be more open in it happening in other areas" (Cate). Some teachers had already used forms of mentoring within their classroom and others commented that they would do so in the future. They all felt using the students as mentors worked well for them and would also work well with other children. Maggie was encouraged to think about possibilities as shown by this statement: "You know that children have a lot to offer but it does open up other avenues using children in your classroom or in your school to help others or to teach others their special skills or skills that they have learnt from someone to pass those onto somebody else." (Maggie)

The teachers also noticed how the child mentors were influenced by and enjoyed this process. As Maggie stated: "The confidence they had because they knew something that I didn't know and they were passing that on and I was excited about it so that made it a really nice time". Clare felt the children were thinking "we are going places and we are taking you with us".

4.3 Adult learning

From the teacher interviews I am confident that this form of mentoring should be further explored. It is evident from the teachers' comments that the forms of professional development in ICT they have previously attended have not been satisfactory for them. They commented that they have been far more comfortable with the children mentoring them and they had a range of reasons for this. First, almost all teachers commented that they often felt intimidated at other forms of professional development either by the adult presenting the session or other attendees. As the most experienced ICT teacher in the school said: "It enhanced it [my learning] because there was no pressure. Sometimes when you've got adults teaching you things there is this pressure to know exactly what you are doing and with the children teaching you that pressure was taken away because they put it into their steps …kids just have a simple way of explaining things sometimes" (Nerida). Surprising for me was the fact that the teachers also felt that the students didn't have high expectations of them with computers and so were not concerned that the teachers made mistakes as they went along. The teachers were happy with this attitude from the children and commented that they felt less pressure with them, as they were "far less threatening" (Jenny). The teachers also stated that they felt comfortable in this partnership because the children didn't mind them asking questions numerous times and they moved at a slower pace than adult-presented professional development sessions. The children also used smaller steps to cover a process and that was seen as very helpful. One teacher commented on the comparison to adult presented professional development: "We were moving more slowly and that is good. Shorter periods of time, learn something, in much the same way as we teach … more likely to remember" (Jenny).

4.4   The children
The obvious positive for the children was their increase in confidence through the project. All teachers commented that they saw signs of the children's growing confidence as each session progressed. As one teacher commented, "Self-esteem built as she realised how little I knew and that she was the knowing other." (Jill).

The children were very positive about being able to share their knowledge with others as one child stated: "I felt good because I shared my knowledge and now someone else can use it confidently." (Olga). The children also showed this confidence in their ability to ask other students for assistance. One child was asked how to use web graphics by a teacher. Although she was not sure of the process she replied that another child was good at that and they could get them to help. As Clare observed, "a great little team".

Being new to mentoring, and particularly with adults, the children were understandably a little nervous due to the uncertainty of what would happen. Some children said they felt nervous or silly about the change in relationship with the teachers." As Eliza stated: "I felt nervous because I thought I wouldn't know what to say or anything". They were concerned that they may make a mistake that would affect the teacher. This showed in their nervousness at the beginning. Milly said: "I felt kind of nervous at the start knowing that you were going to have to teach a teacher and you might stuff up or something". Fred said he felt "a bit funny because normally I am the student, she is the teacher". As well as the situation being different, the children also did not want to offend or upset the teachers. This was obvious in these two statements from children, "I don't want to sound mean to the teachers when I tell them something" (Andrea). "At the start … I was really nervous because I might sound mean to the teachers and disappoint them or something and it didn't happen and I was happy about that" (Gemma).

Once the sessions started and the children relaxed and realised they were actually capable of the task, their feelings became overwhelmingly positive with a range of comments as to why. A typical comment spoke of how they were nervous at the start but realised it was not that bad: "It felt good to actually get it over and done with. I was nervous at the start but now because I know I've done one lesson and it was not as bad as I thought it was going to[3] be. [I thought] I'd just like forget everything" (Rick). Other comments like, "It was good to get it over and done with because you know what you're going to do next week … the first lesson wasn't as scary as I thought" (Rick), showed that the children were really thinking about the process and although they were initially anxious that soon turned to relief and then confidence as they realised they had something to offer the teachers.

4.5   Choosing mentors
There is a wide range of options when choosing children to work as mentors. It was initially suggested to me that the better option might be to choose two children from each grade as mentors for their class teacher. I was only coming into the school once a week so I needed access to the group of children for that whole hour and a half without interruptions. I preferred to work with a single class of children as mentors. I chose this model as it was most workable for me. I feel I have been vindicated in my decision by the following experience recorded in my field notes.

One teacher had a pair of mentors that I would have expected to be very capable. She did not say anything about them until the second session when they were both away, so another child offered to take their place for the day. I saw the

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[3] This quote has been anglicised from the child's slang "gunna".

teacher's face as the child offered to help and I could see she was concerned about this child's ability to assist her. He was a weaker student with a less than strong grasp of English and was seen in the group as the least likely to succeed at the task. The teacher came to me after the session and said she was sorry that she could not have that child for the rest of the project as he was far superior in assisting her to the initial pair. The teacher said the child had great enthusiasm, was sequential in his instruction and gave reasons for why they were doing particular things. She also said the increase in his confidence as the relationship continued was obvious.

I knew choosing mentors was going to be difficult and I see using the whole class as most valuable for my model of professional development. Those with natural mentoring talent should rise to the top and they can share their experiences and expertise with others in their class as the program progresses. The teachers listed a range of qualities they saw in their mentors which may assist in selection but I am far from confident that this small project has revealed all of the key qualities, particularly given that we all learn in different ways and certain qualities will be more sought after by some teachers.

5.   CONCLUSION

> "I don't feel as inadequate as at the beginning – Hence not as stressed and willing to tackle 'new' things with more confidence." (Jenny)

This research was on a small scale but encourages me to delve further into a model for students sharing their expertise in technology as mentors for teachers. Both teachers and students responded favourably to the mentoring sessions and were happy to continue. So, returning to the question I posed in the title, *Children mentoring teachers in ICT: Does it work*? From my experience in this small project I have to say yes, it does. I have seen improvement in teacher skills and confidence with technology, particularly the program *Inspiration*. I have also seen a change in the children involved. Their initial tentativeness was quickly replaced by confidence and a willingness to help others with technology. This project has also given me confidence in this mentoring model to explore it further.

6.   REFERENCES

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