Helping teachers surf the Information and Communication Technology tsunami

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Candidate declaration

I certify that the folio entitled Helping teachers surf the Information and Communication Technology tsunami submitted for the degree of Doctor of Education is the result of my own research, except where otherwise acknowledged, and that this folio in whole or in part has not been submitted for an award including a higher degree to any other university or institution.

Name: OWEN THOMAS SAMBELL BURGAN

Signature: .................................................................

Date: 24 May 2002
Acknowledgements

This Folio is the culmination of a long journey, which began in 1995. It is the result of the support of so many individuals whose contributions I wish to publicly acknowledge.

Firstly there are all my supervisors from Chris Bigum, who inspired me to start my journey, to Robin Stevens, who helped me cross the finishing line. Their ongoing support, advice and, where needed, constructive criticism, have been invaluable and most appreciated.

A special thanks to everyone who contributed to the data collection for my research: the respondents to my state-survey: the key educational leaders from Australia and overseas, who were so willing to be interviewed: all the classroom teachers who shared their PD experiences with me. None of this would have been possible without the support and assistance from the South Australian Department of Education and Children’s Services, who gave me permission to conduct the research in its schools and then funded the state-survey.

Finally there is a group of people who possibly don’t realise just how much they helped me. There is Pip Hamilton who twice threw me a life jacket when I was floundering. Like so many students, I can’t thank the Deakin University Library enough: the service provided was outstanding. Similarly my thanks to my research assistant Deb, who became my “critical friend” and to Ken and Helen and Dawn and Peter for all their technical support and encouragement.

Above and beyond, however, is my wife Joan. She has been there always: her patience, consideration and tolerance have been remarkable. When I “retired” in 1996 neither of us thought I would have to devote so much time to this study in the following six years. She has jokingly said I have spent so much time with my computer that she has felt like filing for divorce and citing the computer as the correspondent!
Abstract

A range of factors, both internal and external, is creating changes in teaching and teachers’ professional lives. Information and Communication Technology (ICT) is just one of the major changes impacting on the teaching profession. As teachers face intense pressure to adapt to this tsunami, this study aims to investigate ways in which teachers can be helped. In South Australia, where this study is set, all teachers in Government schools are expected to be “ICT Smart”, i.e. able to use appropriate forms of ICT to enhance the teaching and learning environment of their classrooms. From the researcher’s involvement for over a decade in professional development for teachers, and from visits to many schools, it appears that numerous teachers have not reached this standard. The greatest need is in Reception to Year 7 schools where the average age of teachers is nearly 50. Because no state-wide data exists, this study is intended to establish if there is a problem and if there is, to identify specific needs and offer possible solutions.

The study is comprised of four parts: Part A, the Introduction gives an overview of the inter-relationships between these parts and the overall Folio. It establishes the setting and provides a rationale for the study and its focus on Professional Development in Information and Communication Technology. Part B, the Elective Research Studies, follows the writer’s involvement in this field since the 1980s. It establishes the theme of ‘Moving best practice in ICT from the few to the many’ which underlies the whole study. Part C, the Dissertation, traces the steps taken to investigate the need for professional development in ICT. This is achieved by analysing and commenting on data collected from a state-wide survey and a series of interviews with leading figures, and by providing a review of the relevant literature and past and existing models of professional development. Part D, Final Comments, provides an overview of the whole Folio and a reflection on the research that has been conducted.

The findings are that there is widespread dissatisfaction with existing models and that there is an urgent need for professional development in this area, because nearly 20% of teachers either do not use computers or are considered to be novice users. Another 25% are considered to be below not yet “ICT Smart”. Less than 10% of ICT co-ordinators have a formal qualification in the field but more than 85% of them are interested in a Masters program.
The study offers solutions in Part B where there is a discussion of a range of strategies to provide on-going professional development for teachers. Chapter 9 provides an outline of a proposed Masters level program and offers suggestions on how it could be best delivered. This program would meet the identified needs of ICT co-ordinators.

The study concludes with a series of recommendations and suggestions for further research. The Education Department must address these urgent professional development needs of teachers, particularly those in the more remote country regions. There needs to be a follow-up survey to establish to what extent teachers in South Australia are now “ICT Smart”.
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This section provides a background to the research study and an introduction to me as a practitioner-researcher. It gives an outline of its focus and rationale and provides an overview of the Folio
Introduction

As well as serving as a general introduction, this section establishes the thesis, which is the thread that binds the Folio together, and the theme which is sustained throughout. The Folio, even though it is comprised of four parts, is an entity, which is very well described by the motto from the Australian College of Education, *Multa membra, corpus unum*, many parts, one body.

Notes for readers

The EdD, although conferred in perpetuity so to speak, will confer on the holder a special responsibility as well. That is to model commitment to the value of ongoing professional development and life-long learning, which is an ethical commitment, as much as it is professional or technical, simply to keep up to date. (Nolan 2000, p. 10)

The examiners were the primary audience when this Folio was written. However, the Folio was written so that after examination a much wider professionally focused audience would read it. This ranges from fellow students, classroom teachers and information technology (IT) co-ordinators, to those leaders who are in a position to assist in ensuring that all teachers will be “IT Smart” i.e. able to use IT to teach a significant part of their lessons and to use appropriate forms of IT to enhance the teaching and learning environment in their classrooms.

CD-ROM and web site publication have made it possible for a wider audience to access the work.1 It seemed fitting that IT was used to deliver what I had to say about teacher professional development in IT.2 It has made available a resource to others who also wish to help their colleagues.

Hopefully it will serve as a reference and a stimulus to others who are interested in similar research. The appendices contain material that provides a background or context for the overall study. They also contain details of survey instruments, funding applications and, where required, the original data collected.

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1 The intention is to publish this Folio in these formats after the examination process. The URL for my website is: http://www.users.on.net/burgan

2 When the study began in 1995, we spoke of computers and related technologies. In the late 1990s the term Information Technology was used. This term is used in this Folio where it is historically correct. The term most widely used now is Information and Communication Technology (ICT).
This Folio follows my career in providing professional development in IT for teachers and lecturers over the past fifteen years. It tells the story of my own professional growth in educational uses of IT from a sceptic, who less than twenty years ago was a cross between an ostrich and King Canute, to a “true believer”. Since 1984 I have been an active and enthusiastic advocate with the vision of making IT work for all. It is this involvement which has provided the background to this study and determined its focus in the area of professional development in IT.

The Folio also traces the developments and changes in the form and content of the professional development provided over that period. Accordingly it can be read in chronological order from a perspective of the past, the present and the future. The end product encompasses a substantial dissertation and a selection of research writing. It will offer suggestions and possible solutions to a critical problem: how to enable more Reception to Year 7 (R-7) classroom teachers to use appropriate applications of IT to enhance the teaching and learning environments in their classrooms.

I hope my work will encourage others to pursue research in the same area and as well provide ideas for those who wish to help their colleagues achieve better practice in classroom uses of IT.

A Personal Reflection

As I reach the end of this study, which began in 1995 when I was in Darwin, I look back over my experiences as a student in the EdD program. When I read through the journal I kept before the colloquium at the Research Proposal stage of the process, I saw that I wrote of the ‘loneliness of a long distance student’.

Hammersley (1984) saw research as a ‘voyage of discovery with much of the time spent at sea.’ In some ways I consider this course of study as a journey through uncharted waters because, unlike a PhD, there was no set framework to follow and at that stage, no completed Folios to give some idea of what this model looked like. I knew where I wanted to go, but I didn’t know where to start or how to get there. Many times I was becalmed, several times I felt as if I had been shipwrecked and

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1 Hence the irony in the title for the Folio.
2 In South Australia the first year of school is referred to as Reception.
often I thought of giving the whole thing away. But thanks to the help, guidance and support from my supervisors and fellow students, it became another stage in my odyssey and journey of discovery in researching ways of helping teachers use ICT more effectively. Even though I am now retired I am eagerly looking forward to my next research project. This is fitting given that the focus of this study has been continuing professional development.

**Focus of the study**

By the middle of 1998, after nearly four years of study, the overall purpose of this investigation work came into focus at the Australian Computers in Education Conference. Both keynote speakers, spoke of the role of leaders in bringing about change. Their concept of visionaries or *agent provocateurs* was very close to my own work for over a decade with pre-service and in-service teachers at undergraduate and postgraduate levels.

The common theme or central focus of my professional activity and academic writing since the early 1980s has been how to spread accomplished practice from a few teachers and schools to many. The majority of the papers I have presented at state, national and international conferences have focused on the idea of educating the educators or training the trainers, because these are the people who will be helping their colleagues. From this theme came the thesis for this study. Teachers still need continuing professional development, both at the workshop level and the formal academic level.

**Rationale for the study**

A range of factors, both internal and external, are creating changes in teaching and in teachers’ professional lives. Technology is just one of the major changes that are having such an impact on the teaching profession.

For many teachers, coming to terms with major changes related to outcomes-based curriculum and school-based management have more direct and inescapable impact on their professional lives. (McKenny 1999, p. 6)

Unlike other innovations such as Reading Laboratories and Open Classrooms that have come and passed, ‘those with responsibility for school education know that the
impact of the new technologies will not pass’ (McKenny 1999, p. 6). Given that ‘teachers are facing intense pressure to adapt to the computer revolution’ (Lloyd 1997, p. 4), this study aims to investigate ways in which teachers can be helped.

Because of my recent state-wide involvement in in-service and pre-service professional development for teachers in classroom uses of IT, I concluded that many teachers have apparently not yet responded to this pressure. This study then will seek to establish if teachers do need help and if so then to investigate possible ways of providing this assistance.

The situation

The emerging revolution in computers and communications technology has already transformed very large industries across the globe. The same tsunami of technological change will sometime in the coming decade approach the presumed tranquillity of the beaches of schooling. (Kelly 2000, p. 12)

In South Australia by the year 2001 there will be one computer for every five students in Department of Education and Children’s Services schools (Lucas 1996, p. 3). By that time all teachers in these schools will be expected to be using information technology to teach a significant part of their lessons (Lloyd 1997, p. 4). Because ‘the children know more than the teachers do and the gap is widening’ (Kilvert 1996, p. 3), there is a larger number of teachers undertaking workshop-type courses in their own time. In the first school term in the year 2000, the Computers in Education Group of South Australia (CEGSA) offered nearly 30 professional development courses.

As well, Burgan (1998) reported that more than 80% of the teachers who responded to a state-wide survey expressed an interest in undertaking a coursework Masters program in classroom uses of IT.

The problem

For more than a decade, studies from Australia, England and the United States (Maciver 1988, Osborne 1989; Bigum 1990; Ragsdale 1991; Marcinkiewicz 1992; Pelgrum and Plomp 1993; Morrow 1995; Norman 1996; Lucas 1999; Milton 1999) have concluded that, just because the technology is available, it doesn’t mean that it
is being used effectively to enhance the teaching and learning environment. Spender (1999, p. 73) spoke of very well equipped schools she had visited where the computers were sitting in a corner, switched off because ‘a lot of teachers are deeply threatened by the fact that the kids know more about them.’

McKenny (1999, p. 7) in her keynote address at the Australian College of Education Conference cited the United States CEO Forum STaR Report, *Professional Development: A link to better learning*, which concluded that the gap between technology presence in schools and its effective use was still too wide. She went on to say that limited evidence from state and national studies indicated that there was progress here in Australia towards improving this situation ‘but not at the pace or depth required to make a major shift in practice’ (McKenny 1999, p. 7). She concluded with these observations which highlight the problem here in Australia.

Teachers are developing basic skills in using learning technologies but the main challenge of integrating new technologies into teaching practice still lies ahead for the bulk of the profession. (McKenny 1999, p. 7)

During 1997, I conducted a state-wide survey of South Australian, Reception to Year 7, Department of Education and Children’s Services (DECS) schools, which revealed that only 18% of teachers surveyed were considered to have successfully embedded IT into their teaching practices (Burgan 1998, p. 3).

This problem is of course not unique to South Australia. The United States School Technology and Readiness (STaR) Report (1999, p. 9) found that in 1998 only 20% of teachers surveyed reported feeling very well prepared to integrate technology into classroom instruction. Jones (1999, p. 7) reported on a national study here in Australia, which investigated the computer skills of over a thousand teachers. It found that, while the teachers surveyed had basic computer skills, between a quarter and a half of those surveyed lacked some of the required skills.

Schools, like other institutions such as banks and universities, have found themselves in a time of rapid technological change. They have an ageing workforce. This problem of an ageing teaching profession is acute in South Australia because the average age of teachers is 48 years (Richardson, K. 2000, pers. comm., 2 March). Many of these teachers have had little training in classroom uses of information technology and until relatively recently, had limited personal skills.
Morrow (1995, p. 2) said that many primary school teachers feel that ‘like recently purchased textbooks they are also now obsolescent’. This situation was graphically encapsulated in this cartoon which shows an exasperated teacher who is speaking to a rather intimidated student:

![Cartoon](https://example.com/cartoon.png)

(Bateup1996, p. 10)

**The solution**

The solution is not as simple as Snyder (1996) concluded: ‘Teachers need external support — Professional Development — to help overcome their lack of familiarity, with computers.’ There is no doubt that the key has to be professional development. Without it, there is little point in giving laptop computers to teachers. But this professional development has to involve more than giving teachers their own personal skills. When teachers come to a training session they must acquire practical ideas they can use in their classrooms the next day. Skills are not enough without knowledge and wisdom.

These three very recent references highlight the pivotal role of teacher professional development in the successful integration of IT in schools. The Information Technology Manager at Kambala Girls’ School outlined the successful approach his school had used: ‘Staff development is the key to successful IT programs in schools. Four years ago, it was our biggest challenge. However, with a supportive Principal and School Council, we’ve been able to overcome the natural reluctance of some staff to using technology in the classroom’ (Milton 1999, p. 4).
The Director of Strategic Development for the South Australian Department of Education, Training and Employment, in his keynote address at the 1999 Australian College of Education Conference in Adelaide, announced a $70 million technology project. He stressed the vital role of staff development as a key element in the successful implementation of any technology program. This same opinion was voiced in this comment on the 1999 School Technology Report published by the International Society for Technology in Education.

Teachers’ training still remains a major hurdle and new teachers are no more likely than veterans to know how to teach with computers: less than one-fifth of the dollars schools spent on technology, goes towards training teachers. (Janah 1999, p. 1)

**Folio structure**

The Folio focuses on developments over the last decade in the provision of in-service and pre-service teacher professional development in IT for classroom teachers from Reception to Year 7. The Folio is divided into four parts: this introductory section, a section which contains the reports of the three Elective Research Studies, a section where the Dissertation is presented and the final section which is a reflection on the whole Folio.

The term ‘chapter’ is used as an organising concept only for Part C, the Dissertation. Adopting a suggestion by Wiersma (1986, p. 378), subheadings have been used throughout the folio. These help to identify and describe the various activities carried out and help convey the continuity of these activities.

**Folio relationships**

This section describes the relationships between the parts of the Folio and how they are in turn related to my activities as a practitioner-presenter-researcher-writer. These relationships are illustrated in the accompanying figures.

The relative “size” of each component is represented as a word-count in Figure 1. The Introduction and Final Comments have 5,000 words, the Elective Research Studies have 20,000 words and the Dissertation has 65,000 words. Because this does not truly represent the relative time and effort involved, Figure 1 also shows this relationship.
Even though the Elective Research Studies only appear to represent barely 30% of the total Folio, the ratio between the Elective Research Studies and the Folio is very close to the recommended 40:60 ratio. The figures for the hours spent do not include the time spent on its actual physical production. They do show the relative amounts of time spent on the research activities associated with the four parts of the Folio.

The total time spent takes into account that for nearly three years I was a full-time student and that I have been retired since the end of the first year of my candidacy. In addition to the time actually spent on the Folio research, there were many other related activities. These included visits to schools and universities in all states of Australia and in England, the United States, Canada and Denmark, 20 other conference presentations, PD workshops, two major funding submissions for state-wide projects and being on the organising committees for five state and national conferences. These activities have amounted to almost the same number of hours, which were devoted to the actual research for the Folio. I kept a log in my journal over the seven years of my candidature. I stopped recording hours spent when I reached 6000 hours on October 13 this year (2001). Figure 2 illustrates the overall balance of time spent on the various components of the Folio.

<table>
<thead>
<tr>
<th>PARTS OF THE FOLIO</th>
<th>PAGES</th>
<th>WORDS</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Introduction</td>
<td>15</td>
<td>4,000</td>
<td>100</td>
</tr>
<tr>
<td>The Elective Research Studies</td>
<td>125</td>
<td>25,000</td>
<td>1100</td>
</tr>
<tr>
<td>The Dissertation</td>
<td>175</td>
<td>60,000</td>
<td>1800</td>
</tr>
<tr>
<td>Final Comments</td>
<td>10</td>
<td>2,000</td>
<td>50</td>
</tr>
</tbody>
</table>

Figure 1

**Figure 2**
Even though each part could stand on its own, each is a vital and contributing or interlocking piece of the jigsaw puzzle, which becomes, when put together, the Folio. The pieces all illustrate the theme of ‘Making IT work for all’ and the puzzle is bound together by the underlying thesis that teachers still need help and it is framed in the context of my on-going professional development activities.

Watson (1987, p. 34) said that writers of scholarly prose had to be careful they didn’t end up with a ‘thick soup’ instead of an ‘attractive salad’. I trust that my Folio is the latter. I hope that readers are attracted by it, enjoy reading it and may even if wish to produce one themselves. Fox (2000) described his Folio as being like a garden in its construction but the final product was like a symphony with its contributing parts, held together by a recurring theme.

Figure 3 represents these relationships of the parts of my Folio as a Venn diagram. All of the parts are inter-related and the professional development activities fit in around them but are part of them. The figure represents the connections and inter-relationships between the parts themselves and to my activities as a practitioner-presenter-researcher-writer.

Relevant experience in the workplace

This section provides details of my association with computers in education for over 30 years and my involvement in teacher professional development in information technology for nearly 20 years. It gives a background to the study and places it in the context of my workplace and professional association activities.
Background

This involvement with computers in education began over thirty years ago when I worked with Year 8 students in a country school in South Australia to construct a battery-powered instrument which used binary numbers to calculate or ‘compute’. I have been using computers since the late 1970s. As an English teacher I could not at that stage see how computers would assist writing, but what started was my fascination with the exactitude of the language required for PILOT, BASIC, Pascal, and Logo.

I have been involved in the use of computers in education since 1985, when as head of the English Faculty at Darwin High School (the largest high school in the Northern Territory), I designed and taught three ‘Computers in English’ classes. This aroused my interest in the impact of computers on the teaching and learning environment. Because of my background as a teacher of Mathematics, History, Social Science, Latin and Indonesian I was interested in the impact computers had on work which students produced in other subject areas.

At this time all of the school’s computers were in the domain of the computer studies teachers and could not be accessed by other teachers. I was the first teacher in the school to use computers in my own subject areas. In studies for a Graduate Diploma in Educational Computing in 1986, I was able to specialise in using computers and related technologies in a range of subject areas.

The researcher’s professional role

This section describes in more detail my work as the sole lecturer in Information Technology for almost a decade in the Faculty of Education at the Northern Territory University. As well it outlines my involvement during that time, and for the past three years, in on-going professional development activities in my role as a member of the Computer Educators Association of the Northern Territory and the Computers in Education Group of South Australia. These activities not only provided the inspiration for this study but the focus for the Elective Research Studies.

When I was interviewed in 1987 for the position as a lecturer in Educational Computing at what is now the Northern Territory University, I confounded the panel when I asserted that if I did my job properly my position should eventually cease to
Part A — Commentary

have a need to exist. This would be because other lecturers would be incorporating into their own lectures what I was covering in mine.

Initially, I was a lecturer in the Faculty of Applied Science because the Faculty of Education had no computing facilities for student use or even courses of its own. These had been developed and delivered by lecturers from the School of Mathematics and Applied Science in the Institute of Technical and Further Education. Very few of the lecturers in the Faculty of Education had a computer and even fewer of them had used computers when they were classroom teachers.

My first major task was to produce an accreditation document for a Graduate Diploma in Instructional Uses of Computers. From the responses of potential students, it became obvious that most of them were in fact teachers, and so the program was accredited as a Graduate Diploma in Educational Uses of Computers. I became its co-ordinator and a lecturer in the Faculty of Education.

For five years I was attached to and operated from the Education Department’s Computer Education Centre, which was located on campus. In this role and as President of the Computer Educators Association and a member of the Computer Education Subject Area Committee, I visited all schools in the Darwin area and many throughout the Northern Territory. This gave me an insight into what was happening in the schools and what were the needs of teachers. In each of those years I presented papers at state, national and international conferences.

In 1992 I became the Co-ordinator of Educational Computing in the Faculty of Education. On sabbatical leave in 1992 I was able to work with elementary school teachers and students and with tertiary students and teachers and teacher education lecturers in the United States, Canada, England and Wales. Most teachers, lecturers and students perceived great value in using computers and related technologies but many of them acknowledged that the full potential was not being realised because too few teachers or lecturers had sufficient experience, expertise or enthusiasm.

Because of my position as co-ordinator of the Graduate Diploma in Educational Computing, I was very interested to discover what was being offered overseas to similar students, i.e. experienced practising classroom teachers. Details were obtained of over twenty postgraduate programs. At the University of Calgary I was
able to work, as a guest lecturer, for almost a term with Masters level students in educational computing.

Most of my time in the Faculty of Education was spent working with teachers and student teachers. I saw my other role as providing help to academic and general staff to improve the quality of their teaching and of student learning and to encourage the general staff to explore the effectiveness of applications of the latest technologies to improve the efficiency of their operations. I set up a Computer Users Group and ran a series of in-house workshops.

By the time I left at the end of 1995, all lecturers except one had and used a computer and most had included the materials I had covered in my units in their own units.

Recent professional activities

Since I have been in Adelaide I have been a committee member of the Computers in Education Group of South Australia. In this role I have been involved in wide-ranging professional development activities in both country and city regions. These experiences gave meaning to my intuitive feeling that there was an urgent need for professional development in classroom uses of information technology. I was able to do something about this by producing two successful funding submissions for state-wide professional development. These projects are described in detail in Part B, the Elective Research Studies.

By working with, talking to and observing teachers state-wide, I was able to establish an idea of their needs, and what were the most successful models for professional development. As well, I was on the organising committees for two state conferences which were attended by nearly 1000 teachers, many of whom came considerable distances from the country.

In 1999 I was elected to the committee of the South Australian Chapter of the Australian College of Education. Because of my background, I was one of the key figures involved in the planning and running of the state conference entitled ‘Putting Technology to Use’. Following from the success of my involvement in that conference and from the preliminary findings from my state-wide survey, I was invited to produce a position paper relating to meeting the professional development
needs of teachers in this field in South Australia. This paper was written and became the basis for a paper presented at WCCE 2001.

My motivation is no longer a university-driven need to ‘publish or perish’ but to continue to take the opportunity to help bring better practice in information technology to others.

**Conclusion**

This overview of the Folio has introduced the nature and context of the problem, which is addressed by this research study. It provides an introduction to the writer as a practitioner in the workplace and a researcher. It describes the relationship between the various components of the Folio and establishes the thesis that underlies and binds it together.
References


Collis, B. 1998, keynote address at the Australian Computers in Education Conference, Adelaide.


PART B

ELECTIVE RESEARCH STUDIES

This section, which is the second of the three elements that comprise the Folio, contains the three Elective Research Studies. Each of these studies demonstrates my own contribution to educational practice and policy in the specialist field of teacher professional development in classroom uses of information and communication technologies.
Introduction

The three Elective Research Studies make up a collection of professional writing. It encompasses a range of forms for reporting research to a variety of audiences — both academic and professional. Items included are conference papers, a journal article, submissions for funding, project evaluation reports and educational planning proposals. Each of the studies was framed to take into account my needs and interests, as well as the opportunities and constraints encountered in my past and present professional work.

Overview

These research studies have contributed to educational policy and practice in my specialist field of professional development in classroom uses of information and communication technologies. Because it is such a rapidly changing area, ‘every teacher faces a continual challenge of becoming and remaining adequately prepared in classroom uses of information technology’ (Schiller 1999, p. 1). The theme underpinning all of these studies is the provision of this professional development as viewed from the perspectives of the past, present and future.

The conference papers, which form the basis of Elective Research Study 1, trace the changing emphasis in computer education from teaching about computers, to teacher-directed classroom uses of computers, to a student-centred, teacher-facilitated approach where computers are used to enhance the teaching and learning environment. They show how the focus in professional development has changed from the concentration on pre-service Computer Awareness courses and one day ‘quick fix’ workshops to in-service upgrading courses for teachers and then to the ‘train the trainer’ model.

It will be argued in the Dissertation that it is these peer leaders, who have been trained as trainers, who are able to help their colleagues by providing situated and ongoing help in response to individual needs. Hargreaves (2000, p. 3) stressed that emphasis has to be shifted from the supply of software and hardware to this model of

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5 This term was used because teachers were supposed to go away, knowing all they needed to know. Currently the philosophy is to provide what is called ‘Just in Time’ training but in fact this is often ‘Just in Case’.
assistance if there was to be sustainable change in teachers’ practice.\textsuperscript{6} I expressed this same view in the conclusions drawn from the findings of Elective Research Study 2.

This same view was also expressed by the Principal of a large independent school (Highett, N. 2000, pers. comm., 28 Feb.), the Director of Strategic Planning for DETE (Richardson, K. 2000, pers. comm., 16 March) and the DECSTech Learning Technologies Project Manager (Filsell, J. 2000, pers. comm., 24 July).\textsuperscript{7} The principle is the basis for the models for professional development that are discussed in detail in the conclusions to Elective Research Project 2.

The studies map the evolving changes that have occurred in my own professional practice over the past decade. In doing so, they reflect my own professional growth in terms of experience and expertise which was gained in the work place at the Northern Territory University and from a nine-months sabbatical leave in 1992 when I visited many overseas institutions and schools. All of the Research Studies were commenced in a chronological sequence, corresponding to the various stages of my progress in the Doctor of Education program. Elective Research Study 1 begins with conference paper written in 1995 and concludes with a paper written in 2001. Elective Research Study 2 began in 1998, during the middle stages, and concludes with a report from the International Federation for Information Processing (IFIP) Working Party at WCCE 2001 (the 7\textsuperscript{th} World Conference on Computers in Education). The journal article, which comprises Elective Research Study 3, was written towards the end of my candidature. It looks at what could be the next focus for teacher professional development.

Each study starts with an introduction, which provides background information and an outline of the structure and scope of the study. Then I have included a brief discussion of how the study relates to the overall Folio.

\textsuperscript{6} This is the only way that “outhouses” can become “lighthouses”(Hargreaves, J. 2000, pers. comm., 24 June).

\textsuperscript{7} I interviewed these three leading figures in South Australia as part of the research for Elective Research Study 2. One of these transcripts is Appendix E. Space constraints meant they could not all be included. They will be on the CD-Rom to be published They are discussed in full in Chapter 6 in the Dissertation.
Preface

Elective Research Study 1 — Professional development in education

‘Changing perspectives in teacher professional development in classroom uses of information and communications technologies.’

This research study takes the form of four papers accepted for state, national and international conferences from 1995 to 2001. As a folio in its own right, it gives an historical perspective of developments in this area for nearly a decade, through a process of reflective review and critique.

Elective Research Study 2 — Action research

‘Models of professional development for the integration of ICT in the classroom’

This research study is in two parts. The first encompassed the writing of a successful funding submission for a teacher professional development project to assist teachers in five country regions of a South Australia. An outline is given of the main sections of the submission. Then there is a brief description of my involvement in the conduct of the project. This first part of the report concludes with suggestions for improvement in future professional development activities.

The second part of the report is a discussion of my involvement as a member of a professional development working party at WCCE 2001, the 7th World Conference on Computers in Education. The organising body, the International Federation of Information Processing (IFIP) had established a series of professional groups as part of its Working Group 3.5 – Information and Communications Technologies in Elementary Education. I was a member of Professional Group 5.2, which was to consider models of teacher development for the integration of ICT in the classroom.
Elective Research Study 3 — An article for submission for publication

‘Why Professional Doctorates are not “Clayton’s “PhDs’.

In 2000, I presented a paper entitled ‘Why we call the Deakin EdD a “real life” PhD’ to the Professional Doctorates 3rd Biennial Conference at the University of New England at Armidale. Because it was not a refereed paper it was not published in the proceedings. In 2001 I received an invitation from Professor Erica McWilliam to submit an article on Doctoral Training for consideration for publication in a special issue of the journal, *Higher Education Research and Development*. The 4000-6000-word article was written to meet the prescribed guidelines.
Elective research study 1

Changing perspectives in teacher professional development in information and communication technologies

Introduction

This research study takes the form of four papers delivered at state, national and international conferences from 1995 to 2001. Each paper explores a different aspect of the underlying theme of the Folio, ‘Moving best practice in IT from the few to the many’.

Theoretical underpinnings

Collis (1993) wrote of the synergy that has to exist between achieving the positive outcomes that information and communication technologies could have on student learning and the impact on teacher education. She concluded that these positive learning outcomes would not occur unless there was a focus on the professional development of teachers. She presented a framework to illustrate this relationship between information technology and teacher education. The first stage was to identify which specific uses of information technology have a positive effect on students’ learning and then make recommendations for future pre-service and in-service teacher education.

<table>
<thead>
<tr>
<th>Type of information technology use</th>
<th>Positive effect on student learning</th>
<th>Impact on teacher education</th>
</tr>
</thead>
</table>

Collis then considered a range of embedded variables, which could have an influence on her proposed framework. These variables, and others that I have identified, have to be considered if this professional development is to lead to these desired outcomes for student learning.

For over a decade I have been involved in promoting the use of information and communication technologies in education. I have followed, and been part of, the movement to assist teachers to be able to use these technologies to enhance the
teaching and learning environments in their classrooms. Collis (1993) concluded that ‘positive student learning effects will not eventuate if the teacher does not change his beliefs and pedagogical habits (p. 119).

These papers all focus on the relationship between evolving uses of those technologies and how they have informed and changed teacher pre-service and in-service education.

**Synopsis**

Every year since 1986 I have presented papers in the area of professional development in information and communication technologies at state, national or international conferences. This report is a reflective review and critique of four key conference papers, all of which have been written since I commenced my doctoral research in 1995.8

The papers are from the Sixth World Conference on Computers in Education in Birmingham in 1995, the Fifteenth Australian Computers in Education Conference in Adelaide in 1998, the Australian Association for Research in Education Conference in Melbourne in 1999 and the Seventh World Conference on Computers in Education in Copenhagen in 2001.

The papers give an account of my involvement in the professional development of teachers in this area, at the formal undergraduate and postgraduate academic levels for both pre-service and in-service teachers.

As a folio of research writing they trace the changes in the nature of this professional development, which reflect the changes in classroom practice that are associated with the dramatic developments in available and affordable technology. The actual papers and their presentation also show my own personal growth as a writer and in the use of ICT. Paper 4 is much more concise, relevant and more fully referenced than Paper 1. In 1990 my presentation was in the form of OHPs with text created with a typewriter and then photocopied onto a transparency. By 1995 I was using a linear PowerPoint presentation. By 2001 I had “burned” my own CD-ROM with a

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8 The paper I presented to the Fifth World Conference on Computers in Education in 1990 has been included as an appendix (see Appendix A) because it demonstrates how dramatic the changes have
multi-media display including sound, video and images: it had direct links to the website I had constructed and to Deakin University. If this has happened in barely a decade, the mind “boggles” at what could be the developments in the next decade.

The papers also show the shift in emphasis from providing courses, which gave teachers their own information and communication technology skills, to a focus on ‘Train the Trainers’, which is the central focus of the whole Folio.

They provide a background to the work of this study and serve as a useful resource that presents an historical perspective of changes in the area over the last decade. When considered as a folio of writing they serve to show how my thinking and professional development activity have been informed and changed by the research carried out at other stages in this study.

Each of the papers will be formally reviewed and critiqued. Footnotes will be used to enable comments to be made on the contemporary relevance or significance of specific sections. These reflections come from the perspectives of evolving models of professional development and changing paradigms in educational computer use in schools.

**Contribution of the papers to the Dissertation**

These papers locate and describe the origin of the study in the context of teacher professional development and hence form a key component of the Folio. They provide a background to the dissertation because they give details of my recent endeavours to meet the specific needs of classroom teachers, particularly at the Reception to Year 7 levels. In working with information and communication technologies co-ordinators or those teachers who are upgrading their information technology skills and qualifications, there has been a progression from undergraduate programs, to the graduate diploma level, and more recently an increasing number of teachers seeking professional qualifications at the Masters level. It is this movement which provides the focus of the dissertation itself.
Structure of the review

A short background section has been included at the start of each paper. The actual papers are reproduced here as they were accepted. The format and referencing have been changed to match the style of the rest of the Folio. The papers have been revisited, and contemporary reflections entered as footnotes to explain terms or comment on significant changes which have since occurred in the field. The papers are then reviewed in terms of how they reflect shifting needs in professional development and changes in classroom practice and how they relate to the dissertation itself.
Liberating the Liberators

A refereed paper accepted for the
Sixth World Conference on Computers in Education,

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Abstract
To successfully liberate the power and potential of the new technologies, the liberators, lecturers, teachers and training officers have to be liberated first. This paper shows how members of such a group were empowered in the use of a range of multi-media and desktop publishing packages. They in turn will become liberators in their own areas of activity. In 1994, in an innovative joint venture, the members of the Computer Educators Association assisted in the delivery of the unit Materials Preparation from the Graduate Diploma in Educational Computing, using facilities provided by the Northern Territory Education Department. This approach provided a vertical integration of expertise and access to the latest technologies and resources, which enabled the development of very effective and stimulating multimedia materials.

Keywords
Teacher professional development, advanced level skills, classroom practice, multimedia

Preamble to the paper
At the time of writing the paper the researcher was the co-ordinator of Educational computing in the Faculty of Education at the Northern Territory University. The paper was accepted for this conference but, because of illness, he was unable to attend to present it. The paper was therefore not published in the proceedings of the conference.

9 This section was not part of the original paper: it has been included to provide pertinent background information.
Introduction

As a result of the dramatic increase in the numbers of computers in schools in the mid 1980s, there were significant developments in Faculties of Education to provide appropriate courses designed to train pre-service teachers in the application of appropriate information technology to teaching and learning.\(^{10}\) In the middle 1980s Graduate Diplomas in Educational Computing were introduced. By the early 1990s all states of Australia offered such a program. There are still more of these programs offered than Masters level programs; nevertheless, more institutions are providing offerings at the Masters level.\(^{11}\)

But as Russell (1992, p. 158) observed, ‘the provision of hardware and software is a necessary but not sufficient condition for the effective use of computers.’ The key to the successful harnessing of the power and potential of the new technologies lies in the appropriate training of the teachers.

There is a body of research reports over the past two decades, which supports the claims for the benefits of pre-service training in classroom uses of computers and related technologies.\(^{12}\) Freyd (1988) published one of the few reports, which considered how the needs of graduate, experienced, practising teachers are met. This paper shows how successful one approach has been in postgraduate education in this area.

I have been the coordinator of educational computing in the Faculty of Education at the Northern Territory University since 1987 and responsible for the preparation and delivery of units at the undergraduate and postgraduate levels. Since 1989 I have delivered a Graduate Diploma in Educational Computing which has catered not only for my own students but as well for students and lecturers in other sectors who desired to use computers to enhance the teaching and learning in their own areas. Core units in the program are Computers and Learning, Resource Management, Social Implications and Materials Preparation. The most successful unit offered has

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\(^{10}\) In 1988 I produced six units for the Diploma of Teaching and B Ed programs and in 1990, the accreditation documents for a Graduate Diploma in Educational Computing program.

\(^{11}\) In 1999 my survey of current course offerings revealed that there were then ten programs at the Masters level and only three at the Graduate Diploma level.

\(^{12}\) By 1995 this term was replaced by ‘information technology’ and now by ‘information and communication technology’.
been Materials Preparation, which utilises the multimedia and desktop publishing capabilities of the computer.\textsuperscript{13} It focuses on the production of computer-generated teaching and learning materials.

In 1994 double the quota number of students enrolled in the unit Materials Preparation. Because the Northern Territory University did not have the facilities or equipment to cater for so many extra students, an approach was made to the Northern Territory Education Department, which made available its Computer Education training facility. Members of the Computer Educators Association helped deliver the unit. This innovative joint venture provided a vertical integration of expertise in postgraduate training for teachers, lecturers and instructors.\textsuperscript{14} The access to the latest technologies and resources enabled the development of very effective and stimulating teaching and learning materials.

This paper outlines the innovative approach that was used to liberate the students in this unit so that they could then empower not only their own students but as well, their colleagues in their areas of activity.

**The present**

Computers and related technologies are being used to enhance the teaching and learning environment. Computers, like any other forms of technology, can be used to maintain the status quo by reinforcing and entrenching outmoded classroom practices. They should of course be used to facilitate the development of a learning environment where active learning and investigation and problem solving replace a content-driven curriculum.

We can no longer talk of education in terms of an end-product of students who can jump over some arbitrarily imposed academic hurdle. Ferguson (1982) said that it has to be considered rather in terms of education being a lifelong process, a journey of discovery and a preparation for a world that is constantly changing. She concluded that this new paradigm of education demands higher order thinking skills such as

\textsuperscript{13} A South Australia wide survey in 1998 revealed that the most desired unit was Resource Management.

\textsuperscript{14} This collaborative approach is suggested as one possible way of delivering the MEd, which is the end point of this whole study. It is also a possible approach that could be used to provide professional development for teachers.
communication and collaboration. We have to ask ourselves how we can harness the
power of technology to assist us as educators to prepare our students for the future.

For the past nine years I have been the only lecturer in classroom uses of computers
and related technologies. Like the Russian State my function has now ceased to
exist. The material and content that I covered and delivered in those units is now
being covered by lecturers in the units they deliver. My colleagues, who deliver units
in Language Arts, Science, Mathematics and Research Methods, are now themselves
liberators who are prepared and able to use information technology to facilitate an
exciting and lasting journey of discovery for their students. All of them realized that
they needed to be able to use the new information technology tools because, in this
decade, more and more learners will have access to them and we, as the trainers,
have to be able to facilitate this process.

Such tools have enabled a shift from the coverage of content in the curriculum to
using the content to help students think and learn about the world. Allan (1991, p. 11),
from the Marigold School in British Columbia, spoke of a ‘new renaissance that
is driven by new technologies’. Students need to be empowered so that they can
access and use appropriate forms of information technology. They need to be able to
cooperate rather than compete. This same philosophy underlay the establishment of

Education must retool to ensure that our students are prepared for a
global community. If we continue to do what we have always done, we
will continue to get what we always got. (Alger 1992, p. 2)

**The approach**

This is the very approach we use in the unit Materials Preparation.\(^\text{i}\) The information
technology tools that we use, encourage active participation, self-paced learning and
offer a choice of learning styles. Our students have the same opportunities as their
pupils to explore ideas, to experiment, to create and to take risks.

Because it is so true that ‘nothing succeeds like success’ we ensure right from the
start that students do have success by tailoring the activities to the individual. This
doesn’t mean that it has to be easy: I coined the term ‘hard fun’ because we expect

\(^{i}\) Students in this unit used a variety of software packages to produce an extensive range of computer-
generated teaching and learning materials.
them to work ‘smarter not harder.’ By the end of the first session they had created, edited, formatted and printed out on a color Laser Printer a ten-slide display, with text and still and moving images.

All of the 30 students in the unit had a background in the use of computers and related technologies. They were mainly teachers, but as well there were public servants, police officers, nurses and lecturers from other areas. With few exceptions, however, they had not worked with the packages or the equipment used in the unit. Software packages used included PowerPoint, MacroMind Director, PageMaker and Adobe Photoshop.

The projects they worked on included a booklet of aboriginal myths and legends, an illustrated Kung Fu handbook, a submission for funding for a Chinese Christian Church, multimedia displays for a police road safety campaign, a cricket club yearbook and a spiral bound Information Handbook for a small independent school.

This approach has been very successful because of the peer tutoring system, which was provided by members of the Computer Educators Association and by students who already had a high level of expertise in the use of specific software packages.

When the students have successfully completed this unit they will be able to use information technology much more effectively themselves. As well they will be able to harness its power to help liberate their own students and colleagues so that they too can take advantage of the vast range of educational activities to enhance the whole range of teaching activities, curriculum, content and methodology.

As Lee (1993, p. 334) concluded, these course participants would join the ranks of those ‘teachers who have willingly tried new things with the computer and are continuing to explore further opportunities in relation to the successful use of computers in the classroom.’ The Graduate Diploma in Educational Computing will not be offered after 1995 but from 1996 there will be a specialization strand within the Master of Education and the Doctorate in Education.

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16 This is the same approach I have used in all my professional development work with teachers. It was the philosophy underlying the funded professional development activities described in Elective Research Study 2.

17 This concept of peer tutoring was the basis of my work with the Computers in Education Group of South Australia. It enables the use of the expertise of other teachers.
The future

Tomorrow’s technology is available today, but why is it not being used to enhance the teaching and learning environment in classrooms?\(^{18}\) It is partly a cost factor, but it is more a problem related to the implementation and effective training of the teachers involved.

One possible solution lies in using the new technologies themselves. Interactive tutorial packages utilizing the capabilities of CD-ROM technology enable users to learn how to use applications and equipment without actually accessing them.\(^{19}\) In much the same way as pilots are trained on flight simulators, these interactive tutorials allow the user to perform real exercises involving all of the major sections involved in the application. At the end of each exercise the user is tested and results recorded.

If progress has not been satisfactory then the user returns to that section before moving on. The ability of such systems to give fast and measurable results is vital in ensuring that the learning process is as effective and efficient as possible.

The instructional programs produced in our other post graduate units by our ‘liberated’ students, using Hypercard and Authorware Professional and Presentation Magic, (authoring packages which create animated interactive presentations without scripting) clearly show the potential in this area. These new units to be offered will provide a postgraduate program of high quality for teachers and other educators. This program will enhance their knowledge in this area of education and as well provide an opportunity for research using the latest technologies and to upgrade their qualifications in an area of vital importance.

A second possible solution is to explore the concept of a Virtual University, which Stuart in 1994 defined in this way.

> The concept of virtuality refers to the ability of a home based student to experience all of the learning and personal development experiences available to the student who is physically located on a university campus. (p. 333)

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\(^{18}\) In 2001 the same problem exists. Therein lies this Research Folio’s thesis that teachers do need professional development.

\(^{19}\) Since by then all government schools in South Australia will have World Wide Web access, the future delivery of professional development could be by using it as an interactive MEedium. This Virtual Workshop concept is explored in Paper 3.
In a country like Australia, where so many students are not able to have physical access to a university, such a technological approach would appear to be ideal. It would promote the principles of open learning and a range of delivery modes to students particularly in the remote regions of Australia and even to the Asia-Pacific region.\textsuperscript{20} Students from the Northern Territory University in Darwin, who live in locations which for many months of the year are not even accessible by road, have been able to complete postgraduate units in information technology via the Internet.

My own use of the communications software package ‘First Class’ has improved my access to an advanced educational experience.\textsuperscript{21} It has allowed me, as a student from Darwin, which is several thousand kilometres away, to participate in a remote learning community at times and places, which are convenient to me, just by using a personal computers from home or at work.

\textsuperscript{20} This of course is very applicable to South Australia where so many teachers are in remote areas.

\textsuperscript{21} The software is provided to students of Deakin University as part of annual editions of ‘The Deakin Learning Toolkit’ (DLT). Since 1999, First Class has been used by many universities to provide web browser access to provide the teaching and learning component of a virtual campus. By 2001 it was being used in 55 countries. The use of such a system is discussed in detail in Chapter 9.
References


Review of the paper

On re-examining the paper closely, I realized there were several ways in which it could have been improved. The paper certainly told a personal story of my activities and was supported by references from other conference proceedings. However, it lacked support from current and relevant research studies. Of course at this stage I was in Darwin and did not have the ready access to reference materials that I have had since.

The paper lacked a consistent theme, that was connected to the title of the paper. It did, however, show how successful one approach had been in postgraduate education in the area of information and communications technology, but it did not show that the liberators had been liberated, other than in a personal sense. Nevertheless it clearly contributes to the underlying theme of the Folio, ‘Making information technology work for all’, because in presenting the paper I had intended using a telecommunications link back to Darwin and to my students. This would have demonstrated the concept of virtuality by showing how remote students could be given the same sort of access which I had experienced.

Changes in professional development needs and classroom uses

By 1995, the emphasis had shifted from the Computer Awareness type programs that I outlined in earlier conference papers (Burgan 1988, 1989, 1990, 1991), to upgrade programs for teachers who were already capable computer users (Burgan, 1992, 1993). There were fewer students undertaking the Graduate Diploma in Educational Computing program but more were taking Masters level programs in Education at the Northern Territory University. Of the thirty students enrolled in the Masters level unit, which is described in the paper, only two were working towards the Graduate diploma. If they completed several of the units that were offered, they had the knowledge and expertise to be able to help their colleagues.

The paper also highlighted the dramatic changes that had occurred in classroom activities in less than a decade because of the available hardware and software. By now primary school students were able to produce quite sophisticated multimedia and desktop publishing materials, which I had not been able to do when undertaking
my own Graduate Diploma in Educational Computing in 1986. The emphasis in classroom activities had shifted from learning about computers, programming, linear adventure games and word-processing, to using authoring systems, multimedia, desk-top publishing and accessing the Internet.

**Contribution of the paper to the Folio**

Given that the thesis for this Folio is that teachers need professional development in Information Technology, this paper illustrated one successful approach. This model, in which a university used expertise and resources from the wider community in the delivery of its units, is one worth pursuing today. This partnership concept is described in detail in Elective Research Study 3.

A rapidly growing interest in Masters level programs was a starting point for my research for this study. It was to provide one of the two foci for the survey of teachers’ professional development needs, which I conducted in 1998 in South Australia. Details of the findings from this survey are in Chapter 5 in Part C of the Folio.

The concept of the Virtual University, which was introduced here and which I used in a modified way in 1995 for students located in remote parts of the Northern Territory, is now of course more of a reality and even possibly a necessity. This concept became the theme for Paper 3 in this collection of conference papers and the genesis of a possible way of delivering the Masters level program in classroom uses of information and communications technology, which is the end product of the Dissertation.
PAPER 2

Making IT work for all


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Deakin University

Abstract
In 1997, the Early Childhood Association (ECHo) felt its members needed help in the area of using information technology across the curriculum. Consequently, they approached the Computers in Education Group of South Australia (CEGSA). The researcher, who was the vice-president of that group, made a successful application for funding for a joint professional development program. This paper describes and evaluates this program ‘Making IT Work—Catch onto computers’. This project enabled CEGSA and ECHO to offer early childhood teachers in the city and country regions, the opportunity to enhance their own information technology skills and explore the latest software, as well as to share successful programming strategies to use information technology in their classrooms.

Keywords
Teacher professional development,
eary childhood teachers,
 improving classroom practice

Background to the paper
At the time of writing the paper I was the vice-president of the Computers in Education Group of South Australia. Because of the success of the project, I was invited to present a paper at the 1998 National Conference of the Australian Council for Computers in Education, which was held in Adelaide.

22 In the title IT was deliberately used instead of Information Technology
23 The term now used is Information and Communication Technology. (ICT)


### Introduction

Morrow in her keynote address to the Australian College of Education conference in Adelaide in 1995 said ‘no teacher can afford to ignore the potential of technology to enhance their teaching’. She went on to say many primary school teachers feel that there have already been significant changes. The effect of change is all the more significant when the age of the school work force is taken into consideration.\(^\text{24}\) She concluded that ‘like newly purchased textbooks they are now also obsolescent’. Gilmore (1995, p. 267) concluded that ‘the critical issue to be addressed if teachers are to confront the challenge of technology in schools is professional development’.

Over the past decade computers have become a significant resource in the classroom. A decade ago the ratio of computers to students was 1:20. By the turn of this century it is expected the ratio will at least 1:5. Unfortunately not enough teachers are using them to enhance the teaching and learning environment in their classrooms. A survey conducted by Markinkiewicz in the United States in 1994 reached the disturbing conclusion that ‘most teachers will not adopt the use of computers even if computers are available and it is believed they can improve the quality of teaching’ (p. 235). The survey revealed that almost half the elementary teachers surveyed did not even use computers.

My recent South Australia wide survey revealed that many primary school teachers, particularly in country regions, lack the skill, expertise and confidence to use computers and related technologies in their classrooms.\(^\text{25}\) The problem is how to spread the accomplished practice from the few to the many. Hence the title of this paper.

Snyder (1996) identified this same problem, in the conclusions to a two-year research project funded by the Australian Research Council. She said she did not think that most teachers were to blame for their inability to get the most out of computers. Most teachers were from a generation that had grown up without computers and so they often found it more difficult to come to terms with them than their students did. She concluded that the solution was simple:

\(^{24}\) By 2001, the average age of teachers in South Australia will be 50.

\(^{25}\) This survey is discussed in detail in Chapter 5 in the Dissertation.
Teachers need external support — Professional Development — to help overcome their lack of familiarity, even fear, of computers. This is the most important factor in ensuring productive and effective use of computers.  

The first section of this paper identifies the professional development needs of early childhood teachers in this area and outlines the rationale for the project. The second describes how the two professional associations provided a program to satisfy the needs of these practising classroom teachers. The final section provides an evaluation of the project and offers some suggestions for future professional development activities in this field.

In my presentation I will be joined by a colleague from the Early Childhood Association who was involved in the planning and carrying out of the project. Attendees at the presentation will have the opportunity to voice their concerns and needs as well as share their experiences, successful and otherwise.

**Background to the project**

In 1997 the Council of Education Associations of South Australia (CEASA) and the Minister for Education and Children’s Services (DECS) signed a Service Agreement under which CEASA received funding for the delivery of professional development activities by CEASA’s member associations. The funding targeted professional development programs, which addressed specific DECS priorities and specific locations with professional development for teachers in country areas having a clear emphasis.

**Description of the project: ‘Making IT work — Catch onto computers’**

The program was designed to offer Early Childhood teachers the opportunity to enhance their own information technology skills as well as to discuss and share successful programming strategies to use information technology in their own classrooms.

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26 This was the same opinion held by all of the leading educational figures who were cited at the beginning of Part B.
A model was created for professional development in information technology by working with Early Childhood teachers in one city site and two country sites so that they have the expertise and materials to replicate the activity in their own schools.

The first workshop was held at Stradbroke Primary School on November 15 from 8.45 a.m. to 12.30 p.m. Although numbers were lower than expected, the computer sessions, run by two CEGSA members, were very popular and successful. Nearly fifty people came to their workshops.

The second workshop was at Naracoorte on November 28. There were ten local teachers at the Open House on the Thursday after school and fourteen teachers from Naracoorte, Meningie, Lucindale and Padthaway at the workshop on the Friday.

The third workshop was held at Tumby Bay on February 20. There were forty six teachers from more than twenty schools and kindergartens who participated in the workshops. Some teachers had come from as far away as Wudinna.\footnote{This represented a round trip of over 500 km.}

**Involvement of DECS’ curriculum personnel**

Jim Dellitt, Superintendent of Curriculum, presented the opening address at the city conference. The video of this address was used in the country. As well Jacqui Probert, Co-ordinator of information technology participated in all workshops.

**DECS priority areas addressed**

*Early years*

This program offered teachers the opportunity to enhance their own information technology skills as well as to discuss and share successful programming strategies to use information technology in their own classroom/work-site settings. Opportunity was provided to view and use up-to-date software.

*Quality teaching and learning*

This program through its design:
• provided teachers with new curriculum materials and further professional development in teaching and assessment.

• developed further mathematics and literacy skills of students through the sharing of successful learning programs in information technology.

*Using information technology across the curriculum*

This program provided teachers with training and development in information technology and through the use of school based co-ordinators it will continue to work towards developing standards for the use of information and communication technology in the curriculum.

Early Childhood participants enhanced their own information technology skills and worked on ideas and strategies to implement information technology in their own classrooms. They obtained materials and teaching ideas to apply information technology across the curriculum.

**Evaluation**

In line with CEASA expectations, statistics were collected from participants as part of the evaluation undertaken at each conference. An appraisal of each session was completed on an evaluation form.

The information was collated and reviewed to inform the planning committee of modifications, which may need to be made to improve future training and development activities. This information will aid in the preparation of further professional development programs in 1998.

**Outcomes**

A successful model was created for professional development in information technology for Early Childhood teachers. Professional development was provided for nearly a hundred teachers. The profiles of CEASA, EChO and CEGSA were lifted, particularly in the country.
The program was viewed as highly successful by comments and observations at the time and validated by the number of high responses on the evaluation forms.

Comments recorded on these forms related to the relevance of the content of the program. Participants said that they would be able to use the information, skills and program format in their classrooms or centres. Many comments related to the need to repeat the workshops or to have more time allocated to a similar program.

Teachers were able to network, share ideas, make professional contacts and engage in rewarding dialogue throughout the workshop sessions.

Participants were particularly pleased with their gains in skills and knowledge and made comments such as ‘enhanced my confidence and ability’, ‘extended my skills’ and ‘will definitely share information with my learning team’.

**Direct feedback**

The following unsolicited comments from the Deputy Principal at one of the country schools, that was involved, indicate clearly how well the program was received.

The day was very informative and all participants valued their time in the computer sessions. The workshops provided a good balance of practical ideas and the opportunity to discuss various methodologies. I would like to thank your colleagues and EChO, CEASA and CEGSA for their support of training and development in country areas.28

**Recommendations from the evaluation of the project**

**Bringing about change**

In light of the decision by DECS that by 2001 all teachers will be expected to be able to use information technology effectively, what are factors which need to be considered if we are to spread the accomplished practice from the few to the many?

Miles (1986) broke the change process into three phases: initiation, implementation and institutionalisation. In this situation the initiative came from the DECS requirement and the decision to dramatically increase the number of computers in

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28 Not all participants were as happy. Many complained that too much was offered in too short a period.
schools. Just because there are more computers in schools and all students are supposed to have a certain amount of access time per week, this doesn’t actually mean the computers are being used to this extent. More significantly it doesn’t mean that they are being used to enhance the teaching and learning environment in the classroom.

Too often the concern has been with the decision to purchase and not so much with the successful implementation. Even with the implementation process there has been too much emphasis on the acquisition of the skill to use the new tool, without the knowledge to use that skill wisely.

*Characteristics of effective in-service activities*

There is no doubt that, to be most successful, the activities have to conducted either on site or close by, with similar facilities, and the in-service has to be ongoing. It can’t be all “show and tell”. There needs to be appropriate explanation and a demonstration, but there has to be hands-on opportunity to practise in a supportive, non-threatening or belittling environment. Then there has to be feedback and support when the time comes to implement the new ideas in the classroom.

There also has to be a variety of approaches employed. These may include event specific workshops, meetings, discussion groups or conferences. There must be ongoing availability of consultants, local facilitators, user-friendly guides (rather than manuals) and support materials of successful classroom approaches.

There needs to a variety of in-service leaders or providers. These can include external “experts”, peers, parents and even pupils.

Shorter sessions at regular intervals, and combining or alternating training and practice with classroom application have proved to be more successful than the “one day horror” model favoured by Mr Lucas, the Minister for Education in South Australia.

*Creating a positive climate for change*

Fullan (1990), in reference to the principal’s role in the change process, listed a series of components, which must be created. These factors apply to the
circumstances needed if information technology is to become an integral part of school life. An underlying insight was the observation for the ‘need to think big but start small’. His plan to implement New Information Technologies in Ontario started with a focus on competency development, which leads to diffusing and supporting effective practice and encouraging networking.

**Suggestions for improvement and future activities**

There needs to be more time for reflection and practice after the hands-on workshops. Too much had to be covered in too short a time. The KISS (Keep it short and simple) principle is very important if participants are to go away not only feeling more confident, but that they have acquired skills and knowledge. Working in pairs at a computer may be an ideal classroom strategy, but it is not appropriate when teachers are acquiring basic skills. Handouts need to clear, simple and step-by-step. Models of similar end products need to be available.
References


Review of the paper

This paper was not submitted for consideration as a refereed paper, but copies were distributed to the delegates who came to the presentation. The basis for the paper was the detailed report, which I had to submit at the conclusion of the project.

Because I felt had to justify the funding provided, this account of the project was perhaps not as critical as it should have been. The model of professional development utilized did provide professional development for more than a hundred teachers, many of whom, certainly “caught onto computers” for the first time.

It is doubtful if many of them, however, gained more than a very limited idea of how to use the software in their own classrooms. In fact some attendees not only said that had they learnt very little, but because of the limited time available for the workshops, which tried to provide too much in too short a time, they went away with a very negative attitude.

The presentation gave delegates the opportunity to comment on the project and share professional development experiences, both positive and negative. The paper had a consistent theme, which was connected to the title of the paper. It did show how one professional development approach could help teachers, particularly in non-urban areas. It clearly contributes to the underlying theme of the Folio, ‘Moving best practice in Information and Communication Technology from the few to the many’.

Changes in professional development needs and classroom uses

The professional development model described in this paper was very close to the model I had been so critical of before (Burgan 1989,1990,1991). For the first time the need to relate the information technology skills acquired to classroom practice was recognised. After each practical session a consultant from the Education Department conducted a session on applying those skills in the classroom.

Some of the participants did feel they were going away not only with enhanced skills and expertise themselves, but as well being able to pass on what they had learnt to other teachers in their own schools.
The paper also highlighted changes that have occurred in classroom activities in the two years since the first paper in this Elective Research Study was written. Then multimedia and presentation software packages were not often used by classroom teachers, but here were quite inexperienced Early Childhood teachers using interactive CD-ROM based software and creating and displaying their own computer generated slide shows.

This was in part because of the available hardware and software. Unfortunately many Early Childhood classrooms were then equipped with the oldest computers in the school. These machines did not have the multimedia capabilities of the ones found in other parts of the school.

The emphasis in classroom activities has shifted from drill and practice type games and word-processing, to using multimedia and desktop publishing software and accessing the Internet.

**Contribution of the paper to the research folio**

Given that the thesis for this Folio is that teachers need professional development in classroom uses of information technology, this paper illustrated one approach that was used to meet this need. Even though it was only partly successful, the conclusions in the final report on the project provided the genesis for a second submission for funding for another state-wide professional development project.

The model adopted in this second project recognised the need to ‘Train the trainers’ who could provide the situated, ongoing professional development, which so many of the participants in this first project, felt would have helped them more.

Since the end product of this whole study is the construction of a framework for a Masters level program in classroom uses of Information and Communication Technology (ICT), the graduates of such a program should be better able to help improve practice in classroom uses of ICT. This paper examined what was a popular professional development model at the time and suggested that there had to be more effective models. These conclusions led to Elective Research Study 2 and also to the research in the Dissertation, which investigated the extent and nature of the professional development needs of Reception to Year 7 teachers in South Australia.
PAPER 3

The Virtual University: Dream or Reality?


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Abstract
A state-wide survey conducted by the writer in 1998 of all South Australia Department of Education and Children’s Services (DECS), Reception to Year 7 information technology (IT) co-ordinators, revealed that less than 5% of respondents had a formal qualification in the area. Significantly more than 85% were interested in undertaking a coursework Masters level program in classroom uses of information technology. The electronic delivery mode was favoured by nearly 60% of these respondents.

Such an approach would enable teachers, irrespective of their location, to enhance their knowledge in this vital and rapidly changing area of education. It would also provide the opportunity for both research using the latest technologies and upgrading of qualifications.

Keywords
Innovation, postgraduate programs, distance education, teachers’ professional learning

Background to the paper
At the time of writing the paper I was a full-time student who had just completed the first draft of my Folio for my Doctor of Education. I received the Australian Association for Research in Education Postgraduate Travel Award to present this paper. Because of the innovative technological nature of my paper, the presentation
took place at the Pre-Conference Workshops held at the Lilydale Campus of the Swinburne University of Technology.

Introduction

This paper is based on my experience as an undergraduate and postgraduate Distance Education student and lecturer. Its focus comes from the end point of my research, a Masters program in classroom uses of IT, which could be offered using a variety of flexible delivery modes. The data used came from the results of a survey I conducted at all DECS Reception to Year-7 sites in South Australia. The paper begins with a brief discussion of the pertinent findings from the analysis of that data.

Delegates will be invited to share their experiences as Distance Education, or Off Campus, deliverers or students and to make suggestions for how the Internet might be used to provide an asynchronous multi-user learning environment (AMULE) for the flexible delivery of on–line teaching and learning. The on-line link demonstrated in my presentation will show how easy it is to use. But, is it a Superhighway or just a Superhypeway? Hence the title of my paper.

Relevant findings from the survey

The IT co-ordinators were asked if they had a formal qualification in the area. Less than 5% of respondents indicated that they did have either a Graduate Diploma or a major strand in a B Ed. It was remarkable that 85% of respondents, including most of those with a formal qualification were interested in undertaking a MEd in this area. The electronic delivery mode was the most preferred option, even by respondents from city schools.
It was for this reason that I investigated the concept of a virtual university, which is discussed in detail in the rest of this paper. In my presentation I will demonstrate how Deakin University has approached the use of this concept by taking delegates on a “tour” of my virtual university.

**Where we have come from in distance education**

Distance tertiary education is not a new concept. I began my journey in 1960 and have still not finished. But it has not all been “beer and skittles”. These comments made by Stuart in 1994 encapsulate my experiences.

> The difficulty of delivering materials at a distance has meant that such courses have, by necessity, been restricted in both their scope and in the fields of study available. Typical offerings have been text based using terrestrial post for communications. This places severe limitations on the type of course offered. Most particularly the opportunity for interaction using this delivery mode is limited and has often been facilitated by telephones and workshops of various durations, ranging from half days to whole weeks. (Stuart 1994, p. 332)

**Where we are now?**

Snewin, from University of South Australia, reporting in 1998 on research findings from a survey conducted with off campus students, many of whom held senior positions in education, reached these interesting conclusions.

> Printed study materials and textbooks achieved by far the highest ratings of importance in the survey. The least important method of delivery was e-mail, which was closely followed by video- conferences. (Snewin 1998, p. 3)

A reason given for this was that 80% of students surveyed did not have access to e-mail, video conferencing or even a CD-ROM player.

In my own experience as a lecturer at the Northern Territory University, fax was probably the most effective media used. As all schools had a fax machine my students from anywhere with a telephone connection, who had problems with programming in BASIC, Pascal or HyperCard could fax in the code and a response was sent as soon as possible. I used CD-ROM and floppy disc materials but found the use of AARNET was more effective because of its immediacy. As soon as I received assignments or questions I could work on a response and send a reply,
which could reach those remote areas, many of which were completely isolated during the wet season.

**Where do we go?**

If flexible electronic delivery methods are to be used effectively they have to be clearly assessed in terms of their feasibility and ease of student access. As Snewin pointed out, delivery using the Internet is not quite as easy as it is often made out to be. Research findings suggest that ‘internet-access and/or familiarity cannot be assumed by educational course developers either.’ (Snewin 1998, p. 3)

He went on to make these recommendations, which are so vital if this form of delivery is to be successful.

> Developers of course or program material need to know that the average user of the Internet, such as schoolteachers and trainers, require a transparency of operation, with intuitive and user friendly commands to guide them. (Snewin, 1998, p. 4)

When you *visit* my A.M.U.L.E. later you can make your own judgement to see if Deakin University has been able to do this.

*Just what is a Virtual University?*

Hiltz (1990), in reference to the University setting, defined the concept of a Virtual Classroom in this way.

> It is a teaching and learning environment located within computer-mediated communication workspaces and facilities constructed in software. All its facilities are accessed not by travelling to a university but by typing into, and reading from, a personal computer which is connected by telephone to mainframe computer operating the Virtual Classroom. Participation is asynchronous: that is users dial in at any time from any location in the world that has a reliable telephone system. (Hiltz, p. 59)

The first time the expression “Virtual University” appears to have been used was by Wills (1993) in a keynote address to a national conference in Australia. Stuart (1994) claimed that the concept grew from a discussion he had had with a colleague regarding virtual reality and a virtual lecture. He concluded that Wills had ‘energized our debate with her use of the phrase.’ He then defined the concept in these terms.

> The concept of virtuality refers to the ability of a home based student to experience all of the learning and personal development experiences available to the student who is physically located on a university campus. (Stuart 1994, p. 333)
This could be achieved without any constraints of time or place. In a country like Australia where so many potential students are not able to have physical access, such a technological approach would appear to be ideal. Students from the Northern Territory University with connection to Internet successfully completed postgraduate level units in information technology, from locations, which for months of the year are not even accessible by road.

In 1999 in a keynote address to a Postgraduate Seminar held in Darwin in conjunction with the national conference of the Australian College of Education, Blackmore spoke of the “vanishing university” in posing the question of whether we still need a conventional university. In this lies of course the genesis for this paper and the end product of my overall research.

**The Deakin University approach**

Deakin University is a leading provider of off-campus professional development and upgrading courses for teachers in schools. The Faculty of Education supports the university’s commitment to the use of information and communication technologies in imaginative and innovative ways.29

Some of its postgraduate programs are conducted through the use of the Deakin Learning Toolkit, which is supplied to students on CD-ROM. This contains a collection of interconnected software that uses computers, networks and point-and-click graphic interfaces to connect users with a variety of underlying information services, software applications and communication tools.

My own use of the software has improved my access to an advanced educational experience.30 It first allowed me, as a student from Darwin, which is several thousand kilometres away from Deakin University, to participate in a remote learning community at times and places, which are convenient to me, just by using a personal computer from home or at work. I have continued to use it as I am finishing my doctoral research from Adelaide.

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29. This use in 1997 of the term information and communication technologies (ICT) was the first the writer had found in his research.

30. The software is now provided to students of Deakin University as part of annual editions of ‘The Deakin Learning Toolkit’ (DLT).
Structure and framework of the proposed program

A review of all such existing programs offered in Australia revealed that there was no consensus regarding structure, content or delivery. The model which is proposed here represents the views and needs of the survey respondents.

Because they already have the technical expertise, these ICT co-ordinators do not need, as many programs still offer, units, which are skill based and appear to have originated in Graduate Diploma programs.

Structure

These comments from promotional material from the University of the Sunshine Coast for its online MBA program so aptly apply to this proposed program.

At the University of the Sunshine Coast we understand the time constraints today's lifestyle demands. Juggling a career and a personal life is a challenge, but add to that gaining your MBA — well, that's pushing it! That's why we offer Australia’s first fully online MBA. (Online MBA, 1998, p. 3)

The pamphlet then went on to list these features of the program.

1. Flexible, self-paced study at home with the latest multimedia technology and materials at your fingertips
2. Online support via the Internet, including chat rooms with other students
3. Optional on-campus workshops for workplace problem solving and peer learning
4. Gain Certificate or Diploma qualifications as you work towards your Masters
5. Additional hard-copy materials with web-site links
6. Full-time and part-time study modes
7. A competitive fee structure.

The features of their program would certainly appeal to students wishing to undertake the program proposed in this study, because it matches almost perfectly what the potential students said in their replies to my state-wide survey.
Framework

The program model is similar to that offered by Flinders University. There would be four units. The first would be similar to existing Research Methodology units and would include a Review of the Literature. The second would include as options the units selected by respondents as being most desirable: Computers and Learning; Classroom Uses; Resource Management; Social Implications. Recognition would be given here for prior learning or experience.

The third and fourth units would comprise a major project or a mini thesis based on students’ areas of expertise or experience. It could be a case study, an action research project or a research study.

Delivery mode(s)

In light of the overwhelming demand for an alternative to existing on-campus delivery modes from questionnaire–survey respondents, the program could be offered primarily externally using electronic delivery, with possibly optional Summer School components.

Conclusion

Perhaps Deakin University, which is committed to the use of information and communication technologies in imaginative and innovative ways might be interested in offering Australia’s first fully online MEd in information technology, using information technology to deliver information technology. From 2001 most of the units in its new MEd are offered online. A University like this, which has so much expertise and experience in off campus delivery of programs, should be interested in combining the convenience of full online delivery with all the support services that can be offered by such a large university.
References


Wills, S. (1993), Strategic planning for interactive multimedia in university education, Keynote address to ASCILITE 93, Lismore.
Review of the paper

The paper presented a clear account of the origin of the concept of a “Virtual University”. Because I was actually presenting the paper in the form of a practical demonstration, it did not contain as much content and detailed references as a normal conference paper.

The paper had a consistent theme, which was connected to the title of the paper. It discussed one approach that could be used to overcome the tyranny of distance in the delivery of university programs.

It clearly contributes to the underlying theme of the Folio, ‘Moving best practice in ICT from the few to the many’, because in my actual presentation I used a telecommunications link to Deakin University. This demonstrated the concept of virtuality by showing how remote students could be given the same sort of access which I had had myself. This allows them to have a similar richness of opportunity as students on campus.

Changes in professional development needs and classroom uses

In the past decade there has been a dramatic increase in the number of students undertaking postgraduate studies in education at Australian universities. Current figures cited in the 1998 Directory of Postgraduate Study indicate that approximately 20,000 students enrol each year.

Professor Adey, Dean of the Faculty of Education at the University of South Australia, in his introduction to the section on Education stressed how essential ongoing professional development is. He concluded with these comments which illustrate the shift in focus to Masters level programs rather than the Graduate Diplomas which had been popular for over a decade.

The majority of postgraduate study is within coursework programs. The 1996 Higher Education budget foreshadowed the progressive introduction of fees for postgraduate coursework degrees. This will result in changes to course profiles with less emphasis on Graduate Diplomas. (Adey 1998, p. 2)
This was the same trend that emerged in the discussion of Paper 1. There were fewer students undertaking the Graduate Diploma in Educational Computing program but more were taking Masters level programs in Education at the Northern Territory University.

The paper also highlighted the dramatic changes that had occurred in classroom activities in since 1995. By 2001 all DECS schools in South Australia have access to the Internet and students are encouraged to utilise this “virtual classroom”.

**Contribution of the paper to the Folio**

Given that the thesis for this Folio is that teachers need professional development in information technology, this paper illustrates one possible approach in the delivery of postgraduate programs. This concept of the Virtual University, which the writer used in a modified way in 1995 for students located in remote parts of the Northern Territory, is now of course more of a reality and even possibly a necessity.

Clearly from the responses to the researcher’s state-wide survey, the majority of teachers interested in undertaking such a program in classroom uses of information and communications technology, expressed a desire to use this form of delivery.\(^{32}\)

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\(^{32}\) Details of this survey are in Chapter 5 in Part C of the Research Folio.
Surfing the ICT tsunami

A paper presented at the
Seventh World Conference on Computers in Education,

Owen Burgan
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Abstract
In the later part of the 1990s the author conducted a range of in-service training activities for the Computers in Education Group of South Australia (CEGSA) in both city and country regions. The distinct impression was gained that just because large numbers of computers were available, it did not mean that all teachers were able to use them to enhance the teaching and learning environments in their classrooms. In 1998, no state-wide data existed on the in-service training needs of teachers in the area of Information and Communication Technologies (ICT), and, as a result, the Strategic Planning Division of the Education Department funded the author to conduct the first ever survey of all 476 elementary schools.

This paper shows how the results from his research confirmed that there was an urgent need for in-service training in the area of ICT, particularly in country regions. Quantitative analysis of data from the survey revealed that less than 20% of teachers at that stage could be considered to “ICT Smart”. More disturbingly, almost 20% were rated as either non-users or novice users. In addition less than 5% of ICT co-ordinators had a formal qualification. The NUD*IST analysis of the qualitative data, revealed that there were serious problems with existing in-service training models. The article concludes by offering a vision of how we can be more successful in the future by utilizing the concept of a virtual workshop.

Keywords
Teachers’ continuing professional development, integration of ICT, distance education, innovation

The term “ICT Smart” refers to teachers being able to use ICT to enhance teaching and learning.
Introduction

The emerging revolution in computers and communications technology has already transformed very large industries across the globe. The same tsunami of technological change will sometime in the coming decade approach the presumed tranquillity of the beaches of schooling (Kelly 2000, p. 12)

Over the past twenty years, as in most other countries, there has been a dramatic increase in the number of computers in Australian schools. Not only has the number of computers in schools increased, but also there has been a dramatic shift in how they are utilized. In the past, computers tended to be clustered in a room where students were taught computing studies by a coordinator. Now, they are an integral part of many classrooms and play a pivotal role in the learning process. By 2001, all teachers in government schools in South Australia will be expected to be “ICT Smart”.

The article first examines the critical impact that the emerging ICT revolution is having on the professional lives of teachers. It looks in particular at the situation in South Australia, but the crisis of course is a problem facing most other parts of the world. It then discusses how the results from a recent research project, confirmed that there was an urgent need for in-service training in the area of ICT and led to a series of directed and innovative training activities. After, briefly evaluating two funded training projects, which resulted from the release of these findings, it then proposes a potentially more successful training model which uses ICT to network the learners and trainers by utilizing a “virtual workshop” approach.

The situation

A range of factors, both internal and external, is creating changes in teaching, children’s learning and teachers’ professional lives. Technology of course is just one of the major changes impacting on the teaching profession. Almost a decade ago, Collis made this comment, which is still so significant today.

Student learning effects via IT use will not eventuate if the teacher is either not facilitated in his or her efforts to investigate the use of IT, or even more fundamentally, if the teacher does not change his or her beliefs and pedagogical habits (Collis 1992, p. 119).
Unlike other ‘technological fads’ that have come and gone, ‘those with responsibility for school education know that the impact of the new technologies will not pass’ (McKenny 1999, p. 6).

For many teachers, coming to terms with major changes related to outcomes-based curriculum and school-based management have more direct and inescapable impact on their professional lives than technology. (McKenny 1999, p. 6)

The 1985 ratio of students per computer in South Australian government schools, of 1:100, fell to 30:1 by 1990, 15:1 by 1995 and 5:1 by 2000. (Burgan, 2001). Teachers are facing intense pressure to be able to cope with this inevitable ICT tidal wave. Hence the title of the article. The article investigates ways in which teachers can be empowered to surf with it and enjoy the excitement and exhilaration and not be drowned or forced out of the water.

Because of his recent South Australia-wide involvement in in-service training for teachers in classroom uses of ICT, the author knew it appeared that many teachers had not yet responded to this pressure. Because no state-wide data existed, the Strategic Planning Division of the Education Department, approved and funded a mail-out survey of all 556 government primary schools to establish if teachers did need help, and if so, to investigate possible ways of providing this assistance.

**The issue**

In 1996, the then Minister of Education in South Australia announced that by 2001 there would be one computer for every five students in Department of Education and Children’s Services schools. According to the Minister, by that time all teachers in these schools would be expected to be using ICT to teach a significant part of their lessons.

This announcement prompted concern that some teachers might have more trouble grappling with the new technology than their students. Because many children know more about technology than the teachers do, there is a larger number of teachers undertaking workshop-type courses in their own time. This is evidenced by the fact that in the first school term in 2000 the Computers in Education Group of South Australia offered nearly 30 in-service training courses.
The problem

Over the past decade, schools, like other institutions such as banks and universities, have found themselves in a time of rapid technological change. One significant problem is that they have an ageing workforce. This situation is acute in South Australia because the average age of teachers is nearly 50. Many of these teachers have had little training in classroom uses of information technology and, until relatively recently, had limited personal experience or skills in this area.

In the last decade, numerous studies from Australia, England and the United States have concluded that, just because the technology is available, it doesn’t mean that it is being used effectively to enhance the teaching and learning environment. This view has been expressed by leading researchers and commentators such as Maciver 1988; Osborne 1989; Bigum 1990; Ragsdale 1991; Marcinkiewicz 1992; Pelgrum and Plomp 1993; Morrow 1995; Norman 1996; Milton 1999 and Hargreaves 2000.

A critical reason for the problem was identified by Au (1997, p. 4), the Senior Lecturer in Educational Computing at the University of South Australia, when he said that ‘Many of our teachers, including key teachers and principals, grew up just ahead of the computer revolution. Many, especially those in who are in their mid – 30’s, have missed out on basic training in computing and other areas of what has been an extremely rapid technological development.’ As a result, you can still visit well-equipped schools in Australia where the computers are sitting in a corner, switched off, because many teachers feel deeply threatened by the fact that the students know more about them than they do.

McKenny (1999, p. 7), cited the United States report, Professional development: A link to better learning, which concluded that the gap between technology presence in schools and its effective use was still too wide. She went on to say that limited evidence from state and national studies indicated that there was progress here in Australia towards improving this situation but not at the pace or depth required to make a major shift in practice. She concluded with these observations that highlight the problem in Australia.

Teachers are developing basic skills in using learning technologies but the main challenge of integrating new technologies into teaching practice still lies ahead for the bulk of the profession. (McKenny 1999, p. 7)
This problem is, of course, not unique to South Australia. A recent Australia-wide enquiry by a Senate Committee of the Commonwealth Government investigated the computer skills of over a thousand teachers. It found that, while the teachers surveyed had basic computer skills, between a quarter and a half of those surveyed, did not have some of the required skills to be able to use ICT to enhance the teaching and learning environment in their classrooms. (Senate Employment, Education and Training Committee Report 1998, p. 45)

Additionally, the United States School Technology and Readiness (STaR) Report (1999, p. 9) found that in 1998 only 20% of teachers surveyed reported feeling very well prepared to integrate education technology into classroom instruction.

**The study**

During 1998, the author conducted a state-wide, mail-out survey of all South Australian, Reception to Year 7 (Primary), Department of Education and Children’s Services (DECS) schools. The aim of this study was to investigate the in-service training needs in ICT of those teachers.

These were the research questions to be answered if this aim was to be achieved:

1. Was there a need for such in-service training?
2. If there was, in what areas?
3. How could these needs be met?

**Research design and procedure**

*Selection of sample*

As the researcher was a resident in South Australia, all DECS Reception to Year 7 schools (n=476) were selected for the study. The sample included all Junior Primary, Primary, Area and Aboriginal schools.

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54 At WCCE 2001 members of the Professional Group 5.2, which looked at models of PD from 8 different countries reported the same problem.
Establishing reliability

The survey instrument, a two-page questionnaire with twenty questions, was piloted with two samples, one city and one country, to ensure that the wording was unambiguous. Several changes were made before the final instrument was printed. The fact that all respondents were presented with the same standardised questions meant that it was possible to expect a high level of dependability of response.

The questionnaire-based survey, which contained 20 questions, was divided into three sections.

Section A was designed to provide demographic data and to establish if there was a need for professional development in information technology. Specifically, it was designed to establish if there was a need for a coursework Masters level program in this area, and, if so, what units should be in it. Rating scales were used to identify areas of greatest interest.

Section B asked respondents to indicate what assistance and workshop activities they considered were most necessary. Rather than a simple ‘yes-no’ response they were required to rank their responses on a 5 point Likert type scale.

Section C gave respondents the opportunity to make any open-ended comments or suggestions

Procedure

The survey instrument with an introductory letter and a Plain Language Statement was sent out by the DECS Distribution Centre to all schools selected in the sample. School principals were asked (if they agreed to participate), to pass the package on to their computing co-ordinators. These teachers were invited to participate in the study by completing the questionnaire and returning it with the consent forms via the DECS Distribution Centre within fourteen days.

Respondents were advised that if they wished to participate further in the study, follow up visits would be made on request to any of the participating schools. In addition all participating schools would receive a copy of the final report from the study.
Limitations of the study

Setting

The decision was made to limit the study to DECS Reception to Year 7 schools. As a result, a state-wide picture could not be obtained as these schools represented just over half of the total number of schools in South Australia. This decision was made on two grounds. The first was the opportunity to use the DECS distribution system for dispatch and return of the survey instrument. Secondly, and more importantly, visits to schools and working with teachers from both the independent and the DECS system enabled the researcher to gain indications that the problem was more acute in the DECS system.

Expected response rate

Indications from other studies, which used the mail out questionnaire procedure, showed that a response rate of only 10% could be a reasonable expectation.

Data collection and analysis

Return rate

The number of questionnaires sent out was 467. Of these, 135 were returned, giving a return rate of nearly 30%. This may have been due to the author’s professional development work in both country and city regions, which made him known to a wide group of teachers, but more likely because of the interest of the teachers concerned. Less than 5% indicated that they did not wish to participate further in the study.

Analysis of data collected

Where possible the results of the survey were coded. The response matrix was in the form of a spreadsheet, comprising 30 columns, each of which was headed by the question number and 135 rows, each of which was designated by the respondent’s assigned number.
The matrix contained the coded responses to the questions. The information drawn from the coded responses was presented in a series of computer generated frequency tables and graphs. These enabled a more efficient and faster means of analysing the responses.

Those questions that could not be coded, because they elicited open ended rather than fixed responses, were transcribed and the data analysed using the qualitative software, NUD*IST.

**Presentation and discussion of the results of the analysis of quantitative data**

Question 9: How do you rate yourself as an ICT user?

![Figure 1: Rating as an ICT user](image)

In relation to teachers’ ratings of themselves as ICT users, less than 20% of the teachers surveyed considered themselves as having successfully embedded ICT into their teaching practices. Of even more concern was the fact that more than 20% rated themselves as below average users and nearly 20% either did not use computers at all or considered themselves to be novice users.
Question 4: Do you have a formal qualification in ICT?

![Chart showing formal qualification](image)

**Figure 2: Formal qualification**

With regard to qualifications in ICT held by teachers, less than 15% of ICT co-ordinators indicated that they had a formal qualification. On closer examination of the data it was discovered that nearly a third of these qualifications were in fact not formal ones. The actual figure for formal qualifications was in fact slightly less than 10%.

Question 5: Would you be interested in a coursework Masters level program?

![Chart showing interest in MEd](image)

**Figure 3: Interested in a MEd**

With regard to an interest in an MEd 85% were interested. This included a number of respondents who already had a Graduate Diploma. More than 60% of these respondents indicated they would prefer it to be offered on-line.^{35}

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^{35} Professional Group 5.2 recommended that funds had to be provided to enable teachers to undertake such programs.
Discussion of the results of the analysis of qualitative data

Introduction

Respondents to the survey had the opportunity in an open-ended question to discuss any major problems or issues relating to the provision of professional development. Because respondents could in no way be identified, they may have been more open and frank in what they said. Responses were received from nearly 40% of respondents. Many of these wrote at considerable length about their problems and concerns. The comments were perceptive, critical and yet constructive. Over 50 pages of comments were transcribed and the data analysed using NUD*IST. In analysing the responses the researcher was looking for common themes and ideas. Three major issues were identified.

The first related to what types of professional development, formal and informal, that respondents had been involved in themselves. Many comments related to what had been done on an individual level out of self-interest or preservation. Then there were observations about activities at the workshop level and organised in-service programs. Finally there were details, and comments on, any formal academic study.

The second related to the need for professional development and reflections on the success of past and existing models.

The third related to their interest in a Masters’ program and what should be in it.

Discussion

There was widespread dissatisfaction, particularly from remote regions, with the existing provision of in-service training. Most criticism was directed at either the attitude of the Department of Education and Children’s Services Education, which had provided funds for equipment, but not adequate provision for appropriate in-service training. Respondents were critical of the effectiveness of the “whistle stop” sessions conducted by visiting experts. Participants, who had driven up to 500 kilometres, came away feeling disappointed and frustrated.

Professional Group 5.2 reached the same conclusion
Similar, very strong criticism was made of existing university courses and programs. ICT co-ordinators were critical of the fact that if they wished to upgrade their qualifications, it had to be at their own expense. The following selection of comments from respondents provides a broad overview of their feelings.

**Criticisms**

*At present the Education Department does not really take training teachers in IT seriously. The training money given is not enough to release each staff member for one day’s training per year. Teachers think this is a joke and so their attitude is: if the department doesn’t really care, why should they?*

*The Education Department has failed to recognise the needs of country teachers. Offering courses and training in Adelaide at the individual’s expense is not a substitute for regional training.*

*‘DETE expects teachers to be computer literate and helps provide the equipment and software, but unlike private enterprise, it does not provide sufficient training’.*

*The course sounds like a wonderful idea but you need to take into account the fact that the average teacher is 47 that makes most of them over 40. They are not interested in going back to college where they lose money by having to pay fees (remember most of us went through University when it was free).*

**Suggestions**

*‘Effective learning is based on an immediate need to use the skill, to put it into practice and evaluate your efforts, revisit the skill and feel confident you have mastered it.’*

*‘It is my belief that a more flexible approach by DECS needs to be adopted, which takes into, account regional needs.’*

*‘We, for example, could be given funding, through an application to DECS, to carry out our own training. All we would need to do is map out our training program in applying for funding, have it approved, if worthwhile, and put it into practice*
Summary of findings

As has been shown, many teachers need external support in the form of in-service training to help overcome their lack of familiarity, even fear, of computers. There is no doubt that the key has to be well designed and effective training. Without it, there is little point in giving laptop computers to teachers, which is now common practice in many government and independent schools. But this professional development has to involve more than giving teachers their own personal skills.

When teachers come to a training session they must go away with practical ideas they can use in their classrooms the next day. Information and skills are not enough: teachers need to feel inspired and empowered. Hargreaves (2000) emphasised the need to shift the focus from expenditure on hardware to providing ongoing collegial professional development in a supportive, non-threatening environment if there was to be sustainable change in teachers’ practices.

Smith (1998) said that any ICT was only as good as the person using it. The establishment of effective staff training programs is essential to the success of the use of information technology in the teaching and learning process (Smith 1998, p. 7). There is no doubt that staff development is the key to successful ICT programs in schools. It is perhaps the biggest challenge for teachers and trainers. However, with the support of Principals and School Councils, it is possible to help overcome the natural reluctance of some staff to use technology in the classroom.

In 1999, the Director of Strategic Development for the South Australian Department of Education, Training and Employment in announcing a $70 million technology project, stressed the vital role of staff development as a key element in the successful implementation of any technology program.

This same opinion was voiced in the following comment in the 1999 School Technology Report published by the International Society for Technology in Education.

Teachers’ training still remains a major hurdle and new teachers are no more likely than veterans to know how to teach with computers: less than

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37 This vital role of school leaders has been neglected for too long.
one-fifth of the dollars schools spent on technology, goes towards training teachers. (Janah 1999, p. 1)

Highett (1999), in his keynote address to a Computers in Education Group of South Australia Conference, stressed the fact that schools must be prepared to allocate more of a school’s budget to training and development. This is the only way to achieve a situation where all teachers have reached a stage where they are using information technology to enrich the teaching and learning environment.

**Are all models of teacher professional development successful?**

*The “visiting expert” model*

The currently most popular model involves training personnel travelling from the city and working with teachers in country regions, either in concentrated part-day sessions or after school or in the evening.

As a result of the findings from a state-wide survey, which revealed the critical need for teacher training, particularly in the non-urban areas, funding was received to conduct two projects which provided teacher training for nearly 500 teachers in five regions.

The first project entitled ‘Making IT Work for All’ was a joint one between the Computers in Education Group of South Australia (CEGSA) and the Early Childhood Association (EChO). It provided over 200 teachers, mainly in country regions, with the opportunity to enhance their own ICT skills and explore the latest software, and to share successful programming strategies enabling them to use ICT in their own classrooms.

The program was viewed as highly successful by comments and observations at the time and validated by the number of high ratings on the evaluation forms. Teachers were able to network, share ideas, make professional contacts and engage in rewarding professional dialogue throughout the workshops sessions. Participants were particularly pleased with their gains in skills and knowledge and made comments such as ‘enhanced my confidence and ability’, ‘extended my skills’, and ‘I will definitely share what I have learnt with my colleagues’. These unsolicited
comments from the Deputy Principal at one of the country schools indicate clearly how well the program was received.

The day was very informative and all participants valued their time in the computer sessions. The follow-up workshops provided a good balance of practical ideas and the opportunity to discuss various methodologies to implement what they had learnt.

Despite this very positive feedback, it was obvious that the model was not as successful as it could have been. Many country teachers often had to travel long distances over bad roads. The funded team was not able to cater well for individual needs and learning styles. There tended to be too much information, given too quickly and not enough time to reflect. There was no follow-up when they returned to their schools.

The ‘train the trainer’ model

A second successful submission was made entitled ‘Train the trainer’, which utilised the skill and knowledge base of ICT co-ordinators in country regions.

Rather than providing the in-service to individual teachers, the funded team worked with smaller groups of ICT co-ordinators in planning, conducting and evaluating workshop activities. As well, as the intention was to establish country “branches” of the Computers in Education Group (CEGSA). With the help of the local ICT co-ordinators, “show and tell” sessions were held after school hours so that other teachers could attend.

This model proved to be successful in several ways. A network of ICT co-ordinators was established, several branches of CEGSA were set up and over 100 country delegates came to the next CEGSA State Conference. In-service training was provided to nearly 200 teachers.

But in discussions with participants and from the analysis of the workshop evaluation sheets, it was obvious that this was still not a very successful model. It was expensive, it was time consuming and not particularly effective in providing the individual help and inspiration that teachers needed.
The Senior Advisor from the Technology School of the Future (TSOF) in Adelaide was a member of the funded team. As a result the decision was made to investigate the use of ICT itself to deliver in-service training in ICT. Hence came the concept of the “virtual workshop” which was derived from the term “virtual classroom” which was first used by Hiltz (1990, p. 59).

Basically it provides teachers with “AMULE”, that is, an asynchronous multi-user learning environment that they can access at any time from any place that has an ICT connection. In South Australia all schools have this facility. All teachers therefore would be able to access a virtual workshop in South Australia.  

Readers are invited to visit the TSOF web site at: http://www.tsof.edu.au/LT.SA

**Conclusions and recommendations**

The results of this research indicate that there is an urgent need for teacher professional development, particularly in the country regions of South Australia. Even though vast sums of money have been spent on hardware and software, critics like Bogle (1997) feel that the emphasis has been misplaced.

> Too much emphasis is placed on hardware and not enough on people – the teaching and technology support staff need to make it work. (Bogle, 1997 p. 5)

The computing co-ordinators, who were the respondents in this study, will be key figures in the successful integration of current ICT because of the role they will play in providing professional development.

This study has revealed that teachers do need help if they are to survive the inevitable ICT *tsunami*. A follow up study could investigate how effective the strategies outlined in this paper have been.

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38 The author had an abstract accepted for an Interactive Workshop at WCCE 2001 at which delegates would have been able to participate in a virtual workshop. The session did not eventuate but the abstract is published in the Book of Abstracts.
References


Hargreaves, A. 2000, Educational change in 3D perspective, paper presented to the South Australian Centre for Leaders in Education Master Class, Adelaide.

Hightett, N. 1999, Technology – The Next Step, keynote address to the Computers in Education Group of South Australia State Conference, Adelaide.


Review of the paper

The paper had originally been drafted for possible submission to Australian Educational Computing or Unicorn, but then I had the opportunity to participate in my third World Conference for Computers in Education. The paper gave me an opportunity to present an overview of my research to an international audience.

The paper presented a clear account of the major research strategy in this present study. I was able to share with colleagues not only my research approach but also the key findings and suggestions for more effective professional development models. My actual multimedia presentation from a CD-ROM, which enabled me to show an example of ‘Surfing the ICT tsunami’ by accessing a “virtual workshop” back here in Adelaide.

The paper had a consistent theme, which was not directly linked to the title of the paper. A better title would have closer to the title for this Folio. ‘Do teachers need help to surf the ICT tsunami?’ would have indicated more clearly what the paper was about. Response from my audience, at the time and after, indicated how well the paper and the presentation had been received.

It clearly contributes to the underlying theme of the Folio, ‘Moving best practice in ICT from the few to the many’, because in my actual presentation I used a telecommunications link to Deakin University. This demonstrated the concept of virtuality by showing how remote students could be given the same sort of access which I had had myself. This allows them to have a similar richness of opportunity as students on campus.

Changes in professional development needs and classroom uses

Since my paper at the Sixth World Conference on Computers in Education in 95, there has been a dramatic increase in the number of workshops offered for teachers, in both the city and the country. But the research findings outlined in this paper, show that there is still an urgent need, particularly in the more remote country schools. Because of the limitations of the "one-off" workshop approach, the Technology School of the Future has expanded its on-line offerings.
The paper also highlighted the dramatic changes that had occurred in classroom activities in since 1995. By 2001 all DECS schools in South Australia had access to the Internet and teachers and students are actively using it as a “virtual classroom” and an invaluable resource. What I was able to do with my multimedia presentation is mirrored by the materials which classroom teachers and students as young as eight years old are able to produce. In 1995 there were only a few teachers, like my graduate students at the Northern Territory University, who had access to the hardware and software and could use them to produce such materials.

**Contribution of the paper to the Folio**

Given that the thesis for this Folio is that teachers need professional development in information technology, this paper establishes that there is a need in South Australia and provides some possible approaches for the delivery of that professional development. The paper provides an overview of the research, which is discussed in Part C of the Folio. It also is linked to the professional development projects described in Elective Research Study 2 and Elective Research Study 3, which looks at what could be the next stage in postgraduate programs, the delivery of professional doctorates.
Summary

The box on the left gives an outline of the focus of each paper. The box on the right outlines the relationship or contribution to the overall Folio.

Paper 1

1995:WCCE: Birmingham
Focus: Graduate in-service programs in classroom uses of ICT. Training the trainers rather than the teachers.

This paper shows the shift in professional development for teachers from pre-service awareness programs, to in-service programs.

Paper 2

1998:ACEC: Adelaide
Focus: Report of a funded project for professional development for Early Childhood teachers.

The conclusions from this paper, led to Elective Research Study 2: more successful approaches to the provision of P.D.

Paper 3

1999:AARE: Melbourne
Focus: Using a Virtual University concept to deliver a Masters level program in classroom uses of ICT.

This paper came from the findings of the research described in the dissertation. It showed a possible delivery mode for such a program.

Paper 4

2001:WCCE: Copenhagen
Focus: Why teachers need help and ways of helping them use ICT more effectively.

This paper provides an overview of the whole study. It introduces the research described in the dissertation.

Conclusion

The papers in this Elective Research Study have given a chronological overview of approaches to providing professional development in classroom uses of information and communications technology. Considered with the 1990 paper from the Fifth
World Conference on Computers in Education (See Appendix A) they serve to provide an insight into changes that have occurred in classroom uses of ICT. They also show how the focus in PD activities has moved from computer awareness type programs, to online workshops on not only how to use the latest hardware and software, but on the pedagogical issues relating to their use to enhance the teaching and learning environment in the classroom.

These papers were selected from many others because they best helped establish the theme of ‘Moving best practice in ICT from the few to the many’ which is carried over into the research in the Dissertation. They also show clearly my role as a practitioner-researcher and how I have been part of that movement myself.
Elective research study 2

Models of professional development for the integration of ICT in the classroom

Background

In 1998 after presenting the paper entitled ‘Making information technology work for all’ (which was a report of a funded state-wide professional development project), I was invited by the Computers in Education Group of South Australia (CEGSA) to write a funding submission for another project. This project was to provide professional development for teachers but only those in country regions.

Based on findings and conclusions from the first project (See Paper 2 in Elective Research Study 1) the model proposed in this second project would utilise approaches and principles that could make the delivery of professional development more effective. There was underlying criticism of the “travelling road show” model in which the “outside” expert spent, at the most a few hours, presenting a predetermined, highly structured workshop. Common concerns were that there was little follow-up or real teacher participation in the planning or conduct of the workshops.

Numerous writers since Havelock and Havelock (1974) have been critical of this approach. More recently Stark (1987), McKenzie (1998), Schiller (1999) and Burgan (2001) have voiced similar doubts about the large scale, one-day, or after school hours, in-service model unless they are ‘supplemented with individual and small group interaction on a continuing basis.’ (Schiller 1999, p. 6)

The underlying principle of this successful submission was the concept of ‘training the trainers’ by working with ICT co-ordinators rather than just with teachers. The aim was to provide these key figures with ideas, models, strategies, information and resources so that they could then organise and conduct on-going professional development activities in their own schools.
Funding was provided for visits to five regions. I was personally involved in the planning and conduct of the first two professional development activities. This involved visiting each centre before hand and establishing that all the planning had been carried out. After each series of workshops the feedback from the participants’ evaluation sheets was analysed and appropriate modifications were made for the next series of workshops.

Including the writing of the submission and the conduct of the first two visits, this amounted to more than 100 hours of my time. This commitment was more than rewarded by the appreciation acknowledged by participants and school leaders. Unfortunately after the second visit I was involved in a serious road accident which meant I could no longer be involved in the project. Since then I have not been able to participate in any other CEGSA activities. However, as a delegate and presenter at WCCE 2001 and member of Professional Group 5.2 I was able to be involved in developing new models for teacher professional development.

**Structure of the report**

The first part of the report, Section A, includes an edited version of the successful submission for the project and then a detailed evaluation of the first two visits conducted as part of that project. Section B, contains a summary from the outcomes of the deliberations of Professional Group 5.2 - Models of Teacher Development for the Integration of ICT in the Classroom at WCCE 2001 (the IFIP World Conference on Computers in Education).

**Relationship to the research folio**

This report traces another stage in my endeavours to meet the professional development needs of teachers. The project, which is described in Part A, gives details of my submission to provide assistance for country teachers. The reviewers of the submission acknowledged the significance of the preliminary findings from the analysis of data collected from my state-wide-survey.39 They agreed that the findings supported my observations from the previous state-wide project that there was a

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39 Details of this survey are in Chapter 5 in the Dissertation.
critical need for professional development, particularly in country regions. The submission had this narrow focus because it was perceived to be much harder for teachers in the country to receive adequate professional development, than for their city colleagues. The findings from the state-wide survey indicated that, while only 20% of city based teachers could be considered to be novice users, the figure for the country was more than 30%. The findings also indicated which regions needed most attention and the types of workshops they most needed.

The second aim of the project was to set up hub-groups and networks with information technology co-ordinators. The last section in Part A describes my professional development work with Information Technology co-ordinators and other teachers who were interested in upgrading their skills and qualifications. Two of these co-ordinators had been respondents in Delphi-style interviews, which were conducted as a follow up to the state-wide survey. These teachers are now among the increasing number of teachers seeking professional qualifications at the Masters level. It is this movement which provides the second focus of the Dissertation.

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40 Details of this project are given in the “Making IT Work for All”, which is the second paper in Elective Research Study 1.

41 These needs were identified in the survey which is discussed in detail in Chapter 5 in the Dissertation.

42 The report of the Delphi-style interviews is found in Chapter 6 in the Dissertation.
SECTION A

Introduction

This section begins with the first page of the successful application for funding. It provides a succinct overview of the whole project. The complete document is found in Appendix B.

| Council of Education Associations of South Australia (CEASA) |
| Funding Application 1999 |

**NAME OF PROGRAM**
Country professional development in information technology: train the trainers

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**Estimated Target Audience:**

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<tr>
<td>Independent</td>
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</table>
Description of the proposed professional development activity

The aim of the project is to work with ICT co-ordinators or key personnel in each of five country regions with the view to establishing regional hub-groups. These teachers will be shown how to plan, present and evaluate professional development activities. They will work with CEGSA member(s) to conduct workshops for R-9 teachers.

Funds will enable CEGSA to visit centres in five country regions. In each case there will be a half-day workshop for information technology co-ordinators or key teachers: it is envisaged that participants will be able to have access to the latest hardware and software. After school hours there will be workshops for other teachers and an evening open house forum for the exchange of ideas and a discussion on setting up regional hub groups. The nominal fee participants are charged for the workshops will be returned if a hub-group is established.

Anticipated outcomes

It is anticipated that the program will be useful to teachers and lead to improved teaching practice and networking. A state-wide survey in 1998 revealed there was a critical need for professional development in information technology, particularly in country regions. Situated professional development will be provided for up to 175, R-9 teachers in five country regions. They will take away with them ideas and materials, which they can use immediately or share with colleagues.

The situated and ongoing professional development subsequently provided will be much more effective than the previous “one-off visiting guru” model which often has been counter productive. ICT co-ordinators and key teachers will have a successful working model, supported by materials provided by CEGSA and by follow up visits. The hub-groups established will be connected electronically and supported by CEGSA’s state-wide activities.
MEETING THE 1999 DEPARTMENT OF EDUCATION OBJECTIVES

IT smart

Information technology co-ordinators who participate in this program will have ideas and materials that enable them to carry out successful ongoing professional development activities in their own schools. Physical and electronic established through the program will promote professional development in information technology at the regional level.

The teachers who participate in the workshops will have the opportunity to work with the latest software and hardware and to share ideas, not only with each other, but also with the recognised innovators from CEGSA. They will take away ideas and materials that they can use immediately to enhance the teaching and learning environments in their own classrooms.

Value for money

If these ICT co-ordinators were to travel to Adelaide the cost would be at least five times more. Costs have been kept as low as possible because workshops will be held on Fridays and presenters will travel home in their own time. This has enabled at least two more regions to participate.

At least 175 teachers in five country regions will have access to leading edge professional development which models best practice in education. They will take away teaching materials in printed and disc form. The project will enable CEGSA to establish a state-wide network of regional hub-groups, which will enable ongoing professional development.

Evaluation

In line with CEASA expectations, statistics will be collected from participants as part of the evaluation undertaken at each workshop. A formal appraisal of each session will be completed on an evaluation form similar to that used in the last project. This information will be collated and reviewed to inform CEGSA of
modifications, which may need to be carried out to improve future training and development activities, which CEGSA will continue to carry out state-wide.

Use of funds

Funds will cover for temporary relief teachers (TRTs) for teachers preparing and delivering the workshops, travel to the venues, overnight expenses at Pt Lincoln, Naracoorte and Renmark and production of materials and software. Workshop presenters will be paid at the same TRT rate. Air travel costs more but saves TRT days and accommodation expenses at Pt Lincoln, Pt Augusta and Naracoorte.

Budget

<table>
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<tr>
<th>Description</th>
<th>Cost</th>
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</thead>
<tbody>
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<td>Clerical and administrative support</td>
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</tr>
<tr>
<td>Printing and photocopying</td>
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<tr>
<td>Presenter fees</td>
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<td>Postage, telephone, fax</td>
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<td>Travel and accommodation</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$4265</strong></td>
</tr>
</tbody>
</table>

Outcomes

As indicated before the submission outlined above was successful and the funding requested was allocated.

In this section there is discussion of the feedback from the first two stages of the project: the visits to Yorke Peninsula and the Riverland. More than 60 teachers participated so the target of 175 for the five visits seemed to be achievable. Subsequently “branches” of CEGSA were formed in both regions and we were delighted that so many country teachers attended CEGSA’s state conference.

Comments on the program

Participants were asked to fill out a feedback questionnaire with sections for general comments and suggestions. Nearly all participants did so and we were pleased with the positive feedback and the constructive criticisms. These comments, in an
unsolicited follow-up letter from a principal from a school that had a number of
participants, give a clear indication of the overall success of the project

On behalf of all the workshop participants on Friday, I would like to
thank you firstly for offering to come to the Riverland and secondly for
facilitating the workshop. The night proved two things. Firstly, there is a
lot of interest from teachers to improve their skills up here and secondly I
believe we have many talented people who are willing to assist others
who can be supported by CEGSA. The night session went well with
people learning something despite it being a Friday night. I did notice a
range of skills and abilities and that catering for that will need to be
addressed. Thanks again for supporting country staff.

Positive

• It was great. It reaffirmed what I am doing—thanks.
• The night was enjoyable and helpful. I loved the examples of children’s work:
• I have some excellent ideas to try myself.
• I am sorry more of my staff didn’t come. We need more sessions like this: it is
  better than having to go to Adelaide.
• It was great to network with others.
• We look forward to being part of CEGSA.
• Thanks for the resources.

Negative

• A pity it had to be on a Friday night.
• Once again we are expected to give up our own time and pay for it!
• It was too basic for me.
• You can’t assume what teachers do know. You must cater for different abilities.
• It was too much at once and what about after you had gone? Who is there to help
  me then?
• You tried to cover too much in such a short time. I didn’t really learn anything.

Suggestions

1. There could have been more units of work rather than skills.
2. Use a questionnaire to establish what participants really need.
3. Advertise so that people know just what to expect.
4. Do we really need experts from Adelaide? What about using our local teachers?
Conclusions and recommendation

It was obvious that the model employed for this continuing professional development was not the most effective one. The last part of this Elective Research Study 1 has a focus on other models. I was, therefore, very pleased to be able to participate in an IFIP Professional Group which was looking at models of teacher development for the integration of ICT in the classroom. My report of my involvement in this group constitutes Part B of this Elective Research Study.
SECTION B

Report from IFIP Professional Group 5.2
‘Models of teacher development for the integration of ICT in the classroom’

Background

At WCCE 2001 (the 7th World Conference on Computers in Education), the International Federation for Information Processing (IFIP) had organised a series of professional groups as part of its Working Group 3.5 – Information and Communications Technologies in Elementary Education.

Because I had four abstracts accepted for proposed presentations in this area, I was invited to be a member of Professional Group 5.2 which was to consider models of teacher development for the integration of information and communication technologies in the classroom. The group held four working sessions during the course of the conference and a draft report was presented to a plenary session on the last day of the conference. 43

Structure of this report

My report for this Elective Research Study was written in the format of a Position Paper that outlines a model for continuing professional development for teachers. It is based on my involvement as a member of Professional Group 5.2 and the draft report, which we presented on the final day of the conference.

Unlike as was done with papers in Elective Research Study 1, this report has not been annotated to allow for reflective comments. This was because of the very contemporary nature of the paper.

43 The final report will be published by the IFIP Technical Committee 3 on Education in a post conference report with the names of the other members of the group.
Relationship to the dissertation

The report describes my participation in this working party with fifteen professionals from eight countries. Because we were looking at models of professional development for the integration of information and communication technologies in elementary classrooms, I felt that I could contribute by sharing ideas and experiences I had gained from my own work place and my research. As well from my involvement with these leading professionals from so many countries, I could gain invaluable ideas and materials.

In particular the models for professional development would provide possible solutions to the problems identified with existing models in the findings from the professional development project outlined in Section A in this Elective Research Study.
Models of continuing professional development for the integration of information and communication technologies in the classroom

Owen Burgan

Member of Professional Group 5.2
IFIP World Conference on Computers in Education

Copenhagen

July 29 – August 3, 2001

Abstract

The writer was a member of this professional group that identified and explored a range of continuing professional development (CPD) strategies, currently undertaken in the countries of the participants. Ultimately, no single strategy was identified as best. Rather a carefully designed set of a variety of strategies was found to meet the varying needs for different countries. The main issues to be faced during the design, implementation and evaluation of these identified strategies include time, funding, language barriers, leadership, lifelong learning and motivating reluctant teachers.

Key words

In-Service Training, Integration of Information and Communication Technologies, Teaching Practice
1. Briefing for participants

The registration booklet for WCCE 2001 provided this outline of the Professional Groups and extended this invitation to interested delegates.

This IFIP World Conference on Computers in Education is a conference for all: for people relatively new to this field and for experienced practitioners. For you, as such an experienced practitioner, the programme Committee offers the opportunity to take part on one of several professional groups where you can share your expertise with other international professionals to produce a report that will be published in the post conference report with your name on it. The IFIP Technical Committee 3 on Education will shape its plans for the future on the basis of these reports.

You need to commit yourself to participate in all of the Group’s meetings and the final presentation. You must also be willing to spend extra time to contribute to the writing of the Professional Group report. The Group reports will form the basis of a post conference report, which will be edited by the conference editors and in which credit will be given to the contributors.44 (WCCE 2001 Registration brochure, p. 7)

1.1 Some definitions

The IFIP Technical Committee 3 on Education provided the following definitions.

Pre-service teacher education (PTE) refers to the formal programs provided by academic units from universities or equivalent institutions in other countries.

Continuing professional development (CPD) refers to any activity that develops teachers’ existing professional knowledge, skills and expertise.

Information and communication technology (ICT) refers to any computer-related technology.45

44 It was an indication of the commitment of participants that we not only gave so much of our time and effort, but that we were prepared to pay a not inconsiderable fee for the privilege.

45 For consistency these terms have been used throughout this Research Folio.
1.2 Introduction

Although the Professional Group considered both PTE and CPD, members elected which of these two areas they would consider. Even though for nearly a decade until 1995, I had been involved in PTE at the Northern Territory University, I elected to be part of the group that considered CPD as this has been the focus of my research and professional activity since then.

There are many national reports that clearly identify critical factors for a more comprehensive and effective integration of ICT into schools. They identify that there are a number of inter-related factors that all need attention to ensure the effective application of ICT in schools. One of the most critical is effective teacher development. Such development is now the focus of many national strategies. One leading example was the 1999 APEC report Canada Forum, APEC workshop from Canada, which considered in detail the integration of ICT through teacher professional development. There was also the 1999 United States report-Professional development: A link to better learning from the CEO Forum on Education and Technology and in Australia DETYA will release its report entitled Models of teacher professional development for the integration of ICT into classroom practice in 2001. Another very different initiative was the Danish national one, which involves the concept of a pedagogical ICT driving licence in an effort to raise teachers’ ICT competencies. Brogger and Gjorling gave details of this initiative, which has already provided training for more than a third of all primary school teachers, in a presentation at WCCE 2001.

While much has been written about effective teacher development, members of the group indicated that implementation at the institutional and systemic levels are often constrained by political, financial and structural factors. The dominant model in many jurisdictions revolves around discrete subjects or topics in both PTE programs and CPD courses.

2. Aims of the group

The group set out to identify and explore the range of CPD strategies currently undertaken in the countries of the participants and to discuss issues surrounding the
effective implementation of such strategies. The chair of the group (Downes) gave us a Briefing Paper, which began with a set of organising questions. These questions are set out below in an abridged format.

2.1 Organising questions

We were asked to consider how this list of professional development strategies and infrastructure components from the 2001, DETYA Report, *Models of teacher professional development for the integration of ICT into classroom practice*\(^{46}\), helped to describe the activities and programs in our own countries. We then had to consider what elements needed to be added, deleted or restated.

**Professional development strategies**

- Sponsorship programs for self-directed formal professional development
- School-based or focused programs
- Single event programs
- Serial courses
- Curriculum development or teaching projects
- Professional learning communities
- Sustained inquiry or teacher research projects

**Infrastructure components**

- Central and advisory services
- Teacher centres
- Navigator or Lighthouse schools offering mentoring, practicums or courses
- Allocation of specialist staff to schools
- Development and provision of resources
• Provision of hardware to teachers

• Partnerships with teacher education institutions in practicums and induction of beginning teachers

• Recognition and certification of learning and expertise

We were then asked to reflect on various country experiences of the advantages and disadvantages of the identified strategies in relation to their purposes. As well we were to identify any published evaluations or reports that would be of benefit for the group to explore

Finally we were asked what we thought were the main issues to be faced during the design, implementation and evaluation of effective CPD programs

3. Frameworks for teacher development

Our sub-group began by considering strategies of models of systemic CPD programmes and the infrastructure components, which were integral to them. Seven strategies had been identified in an Australian report to the Department of Education, Training and Youth Affairs (in press). After considerable discussion we produced this greatly enlarged list. As well we identified from our own experiences, and other research projects, including my own, many more infrastructure components, which we felt were vital. These are considered in more detail in the final report, which will be published by IFIP.

We discussed at length the advantages and disadvantages of each of the strategies. Often these had to be balanced against each other. The advantages of ‘being connected to the daily classroom work of teachers’ or ‘just-in-time assistance’ had to be balanced against the issues of time, cost or the increased workload of teachers. It was very obvious that a combination of elements was necessary to make the CPD as effective as possible.

\[\text{This report will be released later in 2001. The Chair of our group included this material from the report in the Briefing Paper, which we were all given as a starting point for our deliberations.}\]
Individual members of the group provided examples from their own countries. Brief details are given here from Sri Lanka, Finland, Australia and the United States. Each report offers ideas, which could be used here in Australia.

In Sri Lanka, at a national level authorities have identified a range of strategies to support its national policy on ICT. The focus is on developing the human resource and physical infrastructure to deliver CPD for teachers. This was done by setting up “train the trainer” programs and the establishment of central, provincial and zonal teacher training centres. In a scheme that builds on the “cascade” model and could be called a “pyramid” model, there will be ten national ICT trainers who have been trained by other highly qualified and experienced professionals. These national trainers will be responsible for training 100 provincial trainers who will train 1000 zonal trainers. Teachers will receive their training at this level.

At this systemic level several delegates reported examples of long-term CPD strategies, which were embedded into teaching and curriculum projects. In the United States teachers in several districts in Pennsylvania, have worked on a joint task to produce technology-rich lessons for teaching difficult mathematics concepts. All teachers were given a laptop and email access to a project list-server. During the project they had face-to-face meetings, outside of their own schools, with other teachers. There were also online and school-based mentoring programmes and after school skill development sessions. Teachers were able to test their lessons with their own students. As well in a collegial approach, other teachers who were not a part of the project tested the lessons and materials. Support from central office staff helped gain release time for the teachers and increased the possibility of the model being replicated in other districts.

An interesting and innovative strategy was reported from Finland. It was part of a Virtual School project by the National Board of Education. Details were given of a teaching method where literature was taught in an open learning environment over a whole school year. Teachers of literature, who had little or no experience using ICT in the classroom, were provided with tailored help in small steps. During the introductory course, teachers worked online in the virtual literature circles, to gain personal experience of being online members of a common interest group. Then teachers, who had agreed to be part of the project, worked collaboratively with three or four other teachers, to teach mixed ability groups of students. One of the teachers
in each group had the role of a mentor. Support was provided in the forms of online and face to face peer mentoring and a national help desk and telephone assistance.

At a school level there was this example from Victoria. In this delegate’s school new ICT initiatives were introduced at the school level by using ‘in-house’ expertise and outside experts to conduct whole day and after school workshops with a focus on skills development. These workshops centred on producing plans and activities that teachers could then use in their own classrooms.

**Summary of professional development strategies**

- Face to face single events within and outside the workplace
- Face to face sequential multiple events within and outside the workplace
- University accredited courses
- Online single event and sequential multiple-event courses
- Online mentor programmes
- Teacher visits or exchanges
- Curriculum or materials development projects
- Collaborative topic-based teaching projects
- Professional learning community projects or study groups
- Sustained inquiry or teacher action research projects

**Summary of infrastructure components**

We concluded our deliberations by producing the following list of infrastructure components that must be considered in the effective implementation of the strategies listed above.

- Funds for self-directed formal professional development
- Central and regional advisory services
- Teachers’ centres
- Lighthouse or Beacon schools offering mentoring, practicums and courses
- Allocation of specialist staff and a co-ordinator of PD to schools.
- Development and provision of resources
- Provision of hardware and support for teachers
Part B — Elective Research Studies

Elective Research Study 2

- Partnerships with teacher education institutions
- Partnerships with industry and other organisations
- Provision of teacher release
- Recognition and certification of learning and expertise
- Incentives and rewards for minimum standards
- Incentives and rewards for excellence or best practice

4. Issues

The whole group identified a range of issues that were considered to be critical to the sustainability of effective teacher development. In small groups we then wrote a description of each issue and identified strategies to address the issue.

4.1 Leadership development

If teacher development is to be successfully initiated and then sustained, a critical issue is that educational leaders need to appreciate the need to foster a school ethos, which is conducive for this development.

Key elements, which were identified, included the distribution of appropriate resources, technical support and personnel to assist teachers in implementing what they have learnt. A key strategy for achieving such a supportive environment was to ensure that educational leaders were provided with the same in-service development activities. The following examples from Pennsylvania and South Australia show two different approaches, which could be used in other systems.

The United States model revolved around the establishment of technology leadership academies for superintendents of schools, school boards and principals. These academies develop the capacity to lead the implementation of technology-rich, learner-centred learning environments and to support teacher development.

In the South Australian model, the Department of Education, Training and Employment, through its Centre for Leaders in Education, provides regular Master Classes for educational leaders conducted by experts such as Fullan and Hargreaves.
These leaders also have access to an extensive range of on-line and face to face professional development programs.\footnote{Details of these can be found at http://www.leadership.sa.edu.au}

A more formal program in the Archdiocese of Goulburn in New South Wales encouraged principals to embrace the new learning technologies through a Principal’s Professional Development Program. In a three-year program principals are supplied with a laptop and are then required to participate in a range of CPD activities, usually in their own time. Each year they meet to discuss and share their learning.

4.2 Lack of time

This was identified as a constant problem for any school endeavouring to provide sustainable CPD in ICT. Any initiatives must add to the working time of the teacher because many of the teachers are unfamiliar with the new systems and processes.

In an effort to restrict the amount of teacher time required schools are using ICT itself. The use of digital planning assessment software has reduced the need for duplication of the production of materials. Using ICT for administrative tasks and communications (no written daily notices or long staff meetings) has allowed more time for face-to-face and hands-on CPD.

4.3 Motivation and lifelong learning of the teacher

Delegates reported that there were many teachers who were reluctant ICT users. The challenge for providers of professional development was how to motivate these teachers. They need to be encouraged to start their journey of discovery and then to continue for the rest of their lives.

Nearly twenty years ago I used the term “hard fun”. A keynote speaker at WCCE 2001, representing Lego Dacta, also emphasised that learning should be “hard fun” in that the learners should be presented with sufficient challenges to make the learning interesting and that their skills or expertise should be developed. This means creating a situation where the learners enter a “flow” of continuing learning.
We concluded this discussion by identifying the key features, which have to be present for the reluctant learner and the novice to be encouraged to start this life-long journey. These included:

- A collaborative approach which encompasses supporting and sharing
- A continuing dialogue between research and classroom practice
- Encouraging the culture of the teacher as a reflective practitioner
- Using a professional digital portfolio to reflect, celebrate and share.

### 4.4 Money and funding

The CEO Forum on Education and Technology (1999) recommended that a minimum of 30% of a school’s ICT budget should be spent on the provision of in-service CPD. Members of the group felt that this was reasonable but only if ICT use was already successfully integrated. We considered that the figure was too low when the costs of not only the provision of courses but for the relief teachers. In rural regions, such as many parts of Australia, there were greater costs incurred in either sending teachers to other venues or bringing in outside consultants.

When decision-makers place the emphasis on the purchase of hardware for organisational or public relations reasons, it can result in even less available funds for CPD. We offered five possible solutions to this dilemma:

- Consider “student free” days so that whole-staff training could be provided
- Investigate the idea of schools clustering and hence cost sharing
- Provide subsidies for special initiatives
- Engage in commercial or community partnerships
- Utilise on-line professional development.

### 4.5 Language barriers

For some countries where English is not a native language or the language taught in the school curriculum, the language used in ICT became an issue because often software and manuals are written in English. The delegate from Sri Lanka spoke at length about the problem this caused in his country where 95% of teachers are trained in either Sinhala or Tamil. The same problem of course exists in any country where the indigenous people do not have a command of English. Even translation
into the native language has problems because there are no equivalent words for some technical terms.

The only possible solution we could offer was to provide special TV programs, which used the visual medium rather than just the printed word. I was able to cite examples from the Northern Territory University where my students had produced software packages using local aboriginal dialects.

4.6 Rewards and incentives

This was an issue, which has been addressed in a variety of ways already. It was recognised that incentives are needed to encourage teachers to use ICT in their classrooms. These incentives, coupled with a bonus or reward scheme for early adopters, are a way of recognising the effort made by many teachers. The group felt that such approaches could help to allay teachers’ feelings of inadequacy or being overworked.

Members of the group were able to cite specific examples, which had proved successful. Strategies included recognition such as the Advanced Skilled Teaching award in the Australian Capital Territory in Australia, salary increments, providing hardware and allocating study grants.

Several delegates reported the practice of issuing micro-payments. At first we could not see how this was related to CPD, but in fact they reward innovative teachers who develop, primarily in their own time, new resources and strategies. Some members of the group had reservations about this idea of cash payments, but given the user-pay concept in more and more CPD models, it was felt that such payments offer a way of acknowledging the outstanding work done by these teachers.

5. Conclusions and recommendations

At the end of the week of deliberations members of the group felt that we had made a significant contribution to providing more effective models of continuing professional development for teachers in the integration of ICT into schools. It was a privilege and a reward to have been able to work with such a group of dedicated and inspired educators.
The published report will outline these strategies in more detail and examine possible solutions to the issues we have raised.
References


Elective research study 3

An article submitted for publication to the refereed
Journal of Higher Education Research and Development

Background

In 2000 I presented a paper entitled ‘Why we call the Deakin EdD a real–life PhD’ to the Professional Doctorates 3rd Biennial Conference at the University of New England at Armidale. Because it was not a refereed paper it was not published in the proceedings, but several delegates suggested it should be submitted to an appropriate journal for publication. In 2001 I received this email invitation from Professor Erica McWilliam to submit an article for publication in a Special Issue of the Journal of Higher Education Research and Development.

Dear Owen,

I am writing to invite you to contribute an article to the Journal of Higher Education Research and Development Special Issue on ‘Doctoral Training and the Knowledge Economy’. As you may know, this journal is a prestigious international peer-reviewed publication, published by the Taylor and Francis group in association with the Higher Education Research and Development Society of Australasia (HERDSA). My invitation is made to you in my capacity as invited Guest Editor of this special issue, to be published next year. I am hopeful that, given your interest in the area demonstrated by your participation in the Professional Doctorates Conference at UNE last year and your record of scholarly publications, you would consider submitting a 4,000-6,000-word article.

Many thanks in anticipation of your contribution to what promises to be a highly informative issue of HERD.

Regards,

Erica

I submitted an abstract, which was accepted this Elective Research Study is in the form of an article, which was submitted for publication.

Relationship to the dissertation

The article provides an overview of my research study from its commencement in 1995 and up to the submission of the Folio in 2001. It has enabled me to reflect on my experiences in this time and make personal observations about study at the
Doctoral level in general terms and about the Deakin EdD, in particular terms. It is closely linked to the final conclusions of the Folio which suggest that, given the interest in a Professional Doctorate shown by the educational leaders who were interviewed, it could be timely to investigate on a wider basis the interest in such a program. Who would be its students? What could be its framework? How could it be delivered?
Why Professional Doctorates are not “Clayton’s PhDs”.

An invited article written for submission to the Journal of Higher Education Research and Development

Owen Burgan
Doctor of Education student
Deakin University

ABSTRACT In Australia, and other countries, there has been a dramatic rise in the number of institutions offering Professional Doctorates in Education, Health and Business, along with a significant rise in enrolments in such courses. When the author commenced a Doctor of Education course in 1996 there were only two other similar programs in Australia and he was one of eight students. Now most universities offer such a program and there are more than eighty students. This article first explores why there have been reservations about the ‘doctoral’ status of professional doctorates and hence the significance of the title. It then examines the reasons for this burgeoning growth in demand by reflecting both on his own experiences as a student in the final stages of a Professional Doctorate in Education and the views of other experienced writers from here and overseas. The article then looks at the successful Deakin University model and illustrates why it has all the academic rigour of a PhD, but as well flexibility, resilience and significant practical outcomes. It concludes with suggestions for a new generation Professional Doctorate.
Part B — Elective Research Studies

Elective Research Study 3

Introduction

The world in general is evolving so rapidly today that teachers, like most other professional groups, now must face the fact that their initial training will not see them through the rest of their lives. The teaching profession is one where training must last over an entire career, and where skills must constantly evolve and grow (Cornu 1997, p. 7)

Over the last decade, what were the *winds of change* have become a *tsunami*. A range of factors, both internal and external, is creating changes in teaching and teachers' professional lives. Information and Communication Technology (ICT) is just one of the major changes impacting on the teaching profession. Teachers face intense pressure to adapt to this *tsunami*: they are expected to be "ICT Smart". From this author's involvement for over a decade in professional development for teachers, and from the findings of his recent research for his own Doctor of Education, (EdD) it is apparent that numerous teachers have not reached this standard. The situation is compounded by the fact that teachers are an ageing population. In South Australia, where the author’s research was conducted, the average age of teachers in Government schools is nearly 50 (Richardson, 2000). Au (1997) the Senior Lecturer in Educational Computing at the University of South Australia made this observation.

Many of our teachers, including key teachers and principals, grew up just ahead of the computer revolution. Many, especially those in who are in their mid – 30s, have missed out on basic training in computing and other areas of what has been an extremely rapid technological development. (Au, 1997 p. 4)

Snyder (1996) in the conclusions to a two-year research project funded by the Australian Research Council said the solution was simple.

Teachers need external support — Professional Development — to help overcome their lack of familiarity, even fear, of computers. This is the most important factor in ensuring productive and effective use of computers. (Snyder, 1996 p. 1)

Hargreaves (2000) agreed that this was the only way that schools could move from being “outhouses” to “lighthouses”.

Professional learning at doctoral level is broadening the number of stakeholders that have traditionally been involved in the educational provision of this highest academic accolade. In addition to doctoral provision
becoming increasingly diverse, so is the population undertaking them. (Thorne 2000, p. 1)

From conversations and interviews with School Principals, Education Department Officers and Curriculum Advisors in South Australia it became apparent that the problem was not only related to classroom teachers. Most of these leaders did not have any formal qualifications beyond a first degree. They were particularly interested in my research because it was part of an EdD and not a MEd or a PhD. In the discussions there was repeated criticism of the inadequacy of existing MEd programs and the esoteric nature of the PhD. Curiously almost all of them were initially sceptical of the merit of the EdD. This issue is discussed more fully later in the article, but from the discussions came the genesis and title for this article. There was a desire to know more about the philosophy, structure and outcomes from an EdD. As these leaders are the ones who are most likely to bring about desired change in schools, it see MEd logical to me as an EdD student, to investigate this area more thoroughly.

Fullan and Hargreaves (1991) stress that such whole-school change can not occur without the support and encouragement of the Principal, the efforts of the ICT coordinator and support from the relevant Education Department officers. Because the average age of these officers and principals would tend to be even higher than that of classroom teachers, it is not surprising that many of them fall into the category described by Au. It was very interesting that so many of these interviewees expressed an interest in possibly pursuing an EdD.

Method

A variety of research strategies was adopted to collect relevant data. These included a search of the literature, reviewing my own conference papers, structured and informal interviews with educational leaders, a close examination of relevant publications from Deakin University and material from my EdD Folio and the professional journal, which has been kept since 1995.
**Why is the EdD sometimes referred to as a “Clayton’s PhD”?**

For readers unfamiliar with the term, ‘Claytons’ is a non-alcoholic beverage, which is marketed under this slogan: ‘Claytons, the drink you have when you are not having a drink’. The significance of the title of the article should be obvious.

As students we face the repeated comment from people outside the academic arena when we say we are undertaking a Professional Doctorate in Education. Invariably they ask ‘What are you doing your PhD on?’ For many years there has been scepticism about the academic status of a Professional Doctorate when compared with a Doctor of Philosophy. In 1995 my colleagues in the Faculty of Education at the Northern Territory University questioned my decision to undertake an EdD rather than a PhD. In unique Territory fashion they used the term “Clayton’s PhD” to describe what they considered to be an imitation PhD. This scepticism came from the fact that we were all aware of colleagues and senior Education Department officers, who had gone to the United States or Canada, and were back after a year with a Doctorate in Education.

My own scepticism went back as far as 1979 when I visited a colleague from South Australia who was completing a Doctorate in Education in Columbus State University in America. In just over a year this colleague returned to Australia and, on the basis of his newly acquired qualification, was immediately promoted to a very senior position in the Education Department.

More recently when I interviewed senior Education Department officers and Curriculum specialists, as part of the research for my own Doctorate, the same views were expressed and on more than one occasion the term “Clayton’s PhD” was used. However, when the nature and structure of the Deakin EdD model were explained, personal interest was immediately expressed. McWilliam and Taylor (2000) reached a similar conclusion.

> Put bluntly, the only difference between the professional doctorate and the PhD, at exit, looked like 40 000 words (less) of text. And this was seen as a deficit – the professional doctorate was clearly less rigorous and demanding than the “real thing”. (McWilliam and Taylor 2000, p. 5)

In the Deakin model the Folio has a recommended limit of 85 000 words. In addition, in the first two years of the program, students complete a sequence of...
structured research tasks, which culminate in the writing of a 10 000-word proposal for an oral colloquium. When the writing for these “units” is taken into consideration, the Folio written for this degree often exceeds that of a PhD.

**What other writers have to say**

Smyth (2001), in reference to the Canadian situation, observed that there is an ever-increasing demand for Professional Doctorates, with a corresponding drift away from the PhD. As well she spoke of the “blurring” of the distinctions between the two programs, particularly with respect to the length of the thesis and the examination process.

Nolan (2000) reported that Professional Doctorates in Education were relatively new in New Zealand. There were only three at the time of writing, the first of which only started in 1997. His explanation was the pre-eminence of the PhD because of the close British connection and the ‘symbolised equivalence of the status of the PhD’, particularly with respect for appointment to an academic position. These concluding comments in his introduction, have particular significance in this debate.

Arguably, the EdD will now come into its own as the pinnacle composite-academic-professional qualification for high achieving educational professionals. To win acceptance in the education community, it must be comparable in quality to, but qualitatively different from, the PhD (Nolan 2000, p. 3)

In his opinion an EdD should cater for the in-depth professional knowledge and expertise needs, now and in the future, of professionals in senior management and leadership positions. This is the same need this author identified in his research. Such an approach ‘adds a dimension to doctoral study not normally developed in or required by the PhD’ (p. 3). His final comment is particularly pertinent to this very matured-aged and “retired” student It is really the essence of what is a Professional Doctorate.

The EdD [behoves] the holder to model commitment to the value of ongoing professional development and life-long learning, which is an ethical commitment, as much as it is professional or technical, simply to keep up to date (Nolan 2000, p. 10)

Bourner, Bowden and Laing (2000) present a similar picture in England. They report (p. 1) that by 1999, there were nearly 130 programs leading to the award of a
professional doctorate, most of which had started in the 1990s. The most common award, representing almost 25% of this total, was the EdD. They suggest that the dramatic rise in the popularity of the professional doctorates was partly due to dissatisfaction with the PhD. But they also cited a report in *The Times Higher Education Supplement* which referred to these doctorates as “dumbing down” traditional doctoral awards. The paper concluded with a view of what the authors considered are the new generation professional doctorates. This model is very similar to one this author proposes in the final section of this article.

Most of the professional doctorates produced in England in the last three years are distinguishable from the traditional PhD by the variation in structure of the courses and the nature of the research undertaken. They are more likely to involve several research projects, work-based research, and assessment based on a portfolio of outcomes (Bourner, Bowden and Laing, 2000, p. 27).

Maxwell and Shanahan (2000) give a picture of how the state of the Doctor of Education degree in Australia has changed since their survey in 1996. The most significant finding for the purposes of this article was quantitative evidence of the dramatic increase in the number of professional doctorates offered.

Since 1996, 35 professional doctorates have been introduced. At least 16 were introduced in 2000 alone. Since 1996 the number of doctorates has doubled. Education facilities were early into the field. Their proportion has dropped to just under one third. (Maxwell & Shanahan 2000, p. 6)

In 1996 there were 21 EdD programs but by 2000, there were 31. Of special interest, was that the data indicated that ‘seven programs in education have enrolments less than 20. It is very likely that there are some programs considering their viability’ (Maxwell & Shanahan 2000, p. 7).

Thorne (2000) undertook a comparative study of PhDs and professional doctorates in the United Kingdom. Like Maxwell & Shanahan, she highlights the emergence of professional doctorates in the last decade. Thorne cites the University of Middlesex where they have provided for high level learning opportunities of a growing number of students by establishing in 1997 a Doctorate in Professional Studies, which addressed the needs of a growing number of prospective students. Already they have more than one hundred students and seven graduates. This approach is discussed later in this article, where consideration is given to what could be a next generation EdD.
A personal perspective

Since my enrolment in the EdD I have had the opportunity to present papers and workshops at conferences, master classes for educational leaders and post-graduate-seminars. My audiences have ranged from fellow students, senior academics, high-ranking Education Department officers and international experts in this area. To a student, this has been at times a daunting task, but the support, feedback and encouragement received, have been most rewarding and appreciated.

A brief outline of each presentation will show how they have provided a background to this article and contributed to the discussion on professional doctorates.

Conducting Doctoral Research: Some ‘Do’s and Don’ts was presented in 1999 in Darwin at a Postgraduate Seminar conducted in conjunction with the national Conference of the Australian College of Education. The author was able to give practical advice and show examples from his own research experiences.

Why we call the Deakin EdD a real-life PhD was presented in Armidale in 2001 at the Professional Doctorates Third Biennial International Conference. The author’s passion for and belief in the program were clearly portrayed by the response and questions received. The PhD section of his audience was surprised by the rigour of the program and yet the clear practical outcomes that would eventuate from the research. This paper with its multimedia presentation and theme ‘Loneliness of the Long Distance Student’ led to the invitation to produce this article.

Ideas for a New Generation Professional Doctorate in Education was the title of an Interactive Workshop the author conducted at 2001 at WCCE 2001 in Copenhagen.

Teacher Professional Development at the Postgraduate Level A reflective view of the past decade and a vision of the future was a paper presented at WCCE 2001 in Copenhagen. It focused on the progression from the popularity of the Graduate Diploma in the 1980s to the Masters in the 1990s and then predicted that Professional Doctorates would be the “rage” in the 2000s.

Survey research: an account of two different but successful approaches. This was an invited presentation at a Research Expo 2000 a research symposium conducted in 2000 by DETE in Adelaide to “showcase” recent research. The author by reference
to his own research, was able to provide details of a “traditional” state-wide mail out survey to 465 Reception to Year 7 schools and an electronic survey conducted through Deans of all Faculties of Education in Australia.

As students we refer to the Deakin EdD as a real life PhD. We feel that in terms of academic rigour the EdD and PhD are comparable programs. Unlike the PhD, which is only examined on the basis of a final thesis, the Deakin EdD requires candidates to demonstrate their competence in a number of areas and across a range of research tasks. The final product is a folio of work, which includes a selection of reports of research written for a variety of audiences, academic and professional, and a substantial dissertation. These are linked by a commentary, which provides an introduction and a rationale. We consider that the EdD is a practitioner’s PhD and that our research is important because it will hopefully lead to an improvement in educational policy or practice.

**Why I chose the Deakin EdD**

Given my acknowledged scepticism, it might appear unusual that I chose to pursue an EdD rather than a PhD. Having seen, in Australia and overseas, many examples of published PhD theses, I was struck by the rigidity and conformity of their format, structure and approach. Because I could not gain promotion to a Senior Lecturer position or supervise at the Doctoral level unless I had completed a doctorate, pressure was placed on me to undertake a PhD like many of my colleagues in the Faculty of Education.

In my role as a member of the planning committee for a proposed Doctor of Education Degree, I conducted my own investigation of similar programs offered elsewhere. At that stage I only located six in Australia. Contact was made with the co-ordinators and details of the programs were obtained. One of these co-ordinators was Chris Bigum from Deakin University, whom the author knew well from his participation in Educational Computing Conferences. Because of his world-wide recognition as a leader in this field, I was confident in his recommendation of the Deakin EdD. He encouraged me to submit a proposal for their EdD. After a subsequent visit to Melbourne from Darwin, I enrolled in the program in 1995.
Philosophy and structure of the Deakin EdD

Data for this section came from these Deakin University publications. The Professional Doctorate in Education (EdD): Guide to Higher Degree Research Candidature: Higher Degree by Research Administrative Guide: Higher Degrees by Research in Education: EdD Program Review 2000. As well there are comments and observations made by other students in the program and from three PhD students. Some of these comments were made in their Folios and others were made in personal communications.

This comment by a recent graduate encapsulates the reasons why I also decided to undertake a professional doctorate program.

I selected a professional doctorate program where research could be embedded in practice, situated and contextualised with reference to the professional community and the workplace. There was less emphasis on theory and the advancement of knowledge, and more emphasis on identifying problems and coming up with solutions that could be implemented. (Fox 2000, p. 1)

The second student, writing about the educational situation in Papua New Guinea, gave these reasons for choosing a professional doctorate program.

If I was to be part of a workplace responsible for generative curriculum development, I needed to be critically informed about a number of workplace issues and then critically reflect on how my own professional practice could sensitively and respectfully respond. (Young 2000, p. 6)

The third student in 1996 was one of the first to complete the program. She told me that she felt the EdD had enabled her to conduct in her own area doctoral research, which had practical outcomes. (Wakefield, L. 1997, pers. comm., 4 March)

The fourth student, who was also working in the Higher Education sector, said that she was glad she had ignored pressures to undertake a PhD because her research had enable her to bring about worthwhile changes in her own workplace. (Hogan, C. 1998, pers. comm., 21 June)

The fifth student, who held a senior academic position, made similar comments. He said he had chosen the EdD because it gave him more opportunities to explore problem areas in his own workplace. (Fox, R. 1999, pers. comm., 1 August)
The sixth student explained that he changed from the EdD to a PhD because his study was essentially a longitudinal case study, which would contribute to knowledge in the field, but would not lead to any improvement or changes in practice. (Dodd, G. 1998, pers. comm., 1 September)

The final comments were made by PhD students. The first, who had been a Deakin student for nearly as long as I have, said that because she had not been in a workplace situation she felt that she had to choose a PhD and not an EdD. (Bartholomaeus, P. 1999, pers. comm., 1 May). The second student, who had only just submitted his thesis, made these comments in an article on his work.

Doctoral research is often acknowledged as the highest education. It is not surprising therefore that teaching and learning in doctoral education can be problematic – the very nature of the learning environment is based on solving problems, or at least expanding the horizons of knowledge. (Macauley 2001b, p. 15)

This selection of comments from doctoral students gives a clear idea of the distinction between the EdD and a PhD, but at the same time they are comparable.

The Deakin EdD is not a "coursework-plus" degree. It is a structured program of doctoral study normally taking six years part-time because it considered important that students be in contact with their professional workplace. At times during their candidature, students may take periods of full-time study. The degree combines research for a substantial dissertation with a series of research tasks and projects tailored to address problems of policy or practice emanating from candidates’ own professional work situation. It is primarily orientated in investigating, developing and extending educational practice, rather than being devoted wholly to the pursuit of a single contribution to knowledge in a specialised discipline or academic field. The program places more emphasis than usual on the working practices of research including presenting papers at conferences or submitting papers to academic and professional journals.

Examination is on a folio of between 80 – 85 000 words. It normally consists of the three parts. Part A, is an introduction. It establishes the setting and rationale for the study and serves as a commentary, which links the three elements of the Folio. Part B is a selection of research writing related to the student’s area of study or workplace. Part C is a dissertation of between 40 -50 000 words.
Why it has the rigour of a PhD

After six years and more than 6000 hours of work I will be submitting his 300-plus page Folio for examination in December 2001. A brief outline of some of the research activities carried out will convey a clear idea of the academic rigour required for this degree. Readers need to know that before students begin the Folio they have already spent four semesters on a series of structured research tasks, which culminate in the production of a 10 000 word proposal for a colloquium. It is only after this stage has been successfully completed that students are able to commence their actual research.

Part B of the Folio, the Elective Research Studies, contains three refereed papers accepted for National and International conference. These were selected from more than twenty papers written during the period of candidacy and presented in all states of Australia, except Tasmania, and in England, Denmark, France and Canada. There are two submissions for funding for state-wide professional development projects and details of his personal involvement in workshops in ten city and country centres. This involved visiting each centre before hand, being involved in the workshops and then writing an evaluation report for the funding organisations.

There is a detailed report of my participation as a member of Working Party 3.5 at the 2001 World Conference for Computers in Education in Copenhagen. This group of leading educators from eight countries met for several hours on each of the five days of the Conference and produced a preliminary report at a plenary session on the final afternoon. The governing body, the International Federation for Information Processing (IFIP), will publish a final report. The final item is a 3000-4000-word article written for submission as a refereed article to the journal Australian Educational Computing. It provides an overview of the study.

Part C, the Dissertation contains details of the actual research conducted to investigate if teachers needed professional development assistance if they were to be able to use Information and Communications Technology (ICT) to enhance the teaching and learning environments in their classrooms. Outlined below are details of some of the strategies used. They show the rigour applied to the collection of data.
State-wide survey

A state-wide mail out survey was conducted in all 467 Education Department Reception to Year 7 schools. The table below gives an indication of the time spent.

<table>
<thead>
<tr>
<th>Step</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design of questionnaire and the package to accompany it</td>
<td>3 weeks</td>
</tr>
<tr>
<td>2. Distribution and return of survey package state-wide</td>
<td>3 weeks</td>
</tr>
<tr>
<td>3. Follow up reminder letter</td>
<td>1 week</td>
</tr>
<tr>
<td>4. Construction of computer data entry and reporting package</td>
<td>1 week</td>
</tr>
<tr>
<td>5. Data entry</td>
<td>1 week</td>
</tr>
<tr>
<td>6. Follow up thank you letter</td>
<td>1 week</td>
</tr>
<tr>
<td>7. Analysis and interpretation</td>
<td>3 weeks</td>
</tr>
<tr>
<td>8. Production of survey report</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

Because of the remoteness of many of the schools, costing for this research project would have been in excess of $3000. The Education Department considered the survey so worthwhile because no such data existed that it printed the survey instrument package, distributed it to all the schools and arranged the collection and return.

The qualitative data was relatively easy to encode and analyse using Statview and Excel, but the qualitative data in the form of more than a hundred of pages of hand-written responses to an open-ended question proved much more time consuming. All responses were entered into a computer file in a format that NUD*IST could analyse.

Survey of current Masters level programs in ICT

I attempted to survey all existing programs by examining publications such as the *Directory of Postgraduate Study* or the *Good Universities Guide to Postgraduate Courses*. This proved to be unsatisfactory because some entries were not current and some programs were not listed at all. The author followed a model used by Collis (1986) in her survey of all Higher Education Institutions in Canada. But rather than use a mail-out instrument, I used e-mail to contact the Deans of all Faculties of Education in Australia.
They were asked to confirm if they did have such a program and if so to provide contact details for the co-ordinator. I then contacted these co-ordinators personally and obtained either printed versions of course documents or a web address from which they could be downloaded. A final check was made with the current issues of the Directory of Postgraduate Study and the Good Universities Guide to Postgraduate Course. This whole process took considerably less time than the traditional approach and I feel that it gave me a more accurate Australia-wide picture.

**Interviews**

Structured interviews were conducted with leading educators from South Australia. They were provided in advance with the questions to be asked and the areas to be discussed. Each interview lasted between half an hour and an hour and was recorded. Transcripts of the interviews were analyzed with NUD*IST to establish common themes and trends.

Informal interviews were conducted with key figures from Australia, Canada, America and Holland. A similar approach was used with participants at workshops and conferences. Notes were kept but the interviews were not recorded.

A modified version of the Delphi technique was used in follow up interviews with respondents to the state-wide survey who indicated they were willing to participate further in the study. They were sent a summary of the findings of the analysis of the responses to the open-ended question in the survey instrument and asked to respond. These responses were then analysed and the process repeated. I ended up with a concise picture of what these respondents felt were the most vital issues and their possible solutions.

**Why it is so flexible and resilient**

Rather than the end product just being the examination of a single written thesis, the Deakin EdD requires candidates to demonstrate their competence in a number of areas and across a range of tasks. The Folio can include a range of forms for reporting research to a variety of audiences, academic and professional. These can include submissions, evaluation reports, essay or book reviews, bibliographic essays, academic or professional journal articles, conference papers, interviews, fictional writing or even...
other media such as video, photo-study or in this author’s case a CD-ROM containing PowerPoint presentations, video clips of workshops and recordings of interviews.

It would appear that the suggestions for the structure and format of the Folio are rigid, but in practice this is not so. The final mould of an individual Folio can be quite different to the set one. It is not only the length, which can range from 85 000 to 100 000 words, but the proportionate balance between the Elective Research Tasks and the Dissertation can vary from 35:65 to 50:50. The actual number of pages, excluding references and appendices, has varied from less than 200 to more than 300. The author’s Folio, because it contains so many tables and figures from the analysis of data from his survey, will certainly be at this upper level. One Folio, successfully submitted in 2000, consists of three Project Reports. In a second Folio, the Elective Research Studies comprised a single short story.

Who are its students?
They come from a broad range of positions in the field of education. They include university lecturers, military and naval trainers, nurse educators, managers of distance and adult education centres and senior education officers. They are all experienced educators.

Why has it become so popular?
When I commenced my EdD in 1995 there were only eight students in the program. Now there are more than eighty. The program is only offered in the distance mode and Deakin University is a recognised leader in this field. Prospective students probably carry out preliminary investigations similar to those conducted by this author. The philosophy, structure and delivery of the model obviously appeal to a wide range of students. Deakin University is a recognised leader in Distance Education because of the range and quality of its programs and its support services, particularly the IT and the Library. Successful and satisfied students like me have been vocal and passionate advocates, and (at times) critics in conference presentations and papers, in our dealings with other professional colleagues and in more public forums such as educational symposiums.

It could also be a factor of the natural progression in postgraduate education from the Graduate Diplomas in the late 1980s, to the Masters programs in the early 1990s and Professional Doctorates in the late 1990s and the early 2000s.
Conclusions

In this article as in all my relevant presentations and papers I have consistently pursued the thesis that the Deakin EdD is a “real-life” PhD. Because of its academic rigour due to its work commitment over a wide range of research activities, it is not a mere extended coursework version of a “watered down” PhD. It is certainly not a “Clayton’s” PhD. It is not a PhD but it is its academic equivalent.

I have appreciated the opportunity to write for this very different reader-base. I would like to feel that, as a student, I have been able to contribute to the discussion on Doctoral training. I hope this article may encourage other students to submit articles for consideration for publication.

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References


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Review of the article

Because I had a tight deadline to meet with the submission of this article, on re-examining it closely, it was clear that there were several ways in which it could have been improved. The article told a personal story of my own experiences as a Doctoral student and was supported by references from other more experienced writers. However, it lacked conciseness and relied too much on material from Deakin University publications.

The article did have a consistent theme, which was connected to the title of the paper. It showed, from my own personal experience and from comments by fellow students, the rigour and flexibility and practical nature of the Deakin EdD. I feel it did contribute to the discussion on Professional Doctorates because it establishes that the Deakin EdD is not a mere “Clayton’s “ PhD.

Changes in meeting continuing professional development needs

By 1995, the emphasis had shifted from the Graduate Diploma programs that I had discussed in detail in earlier conference papers (Burgan 1988, 1989, 1990, 1991), to upgrade programs for teachers who were taking Masters level programs in Education. By 2000 there had been a dramatic increase in the number of Doctoral programs offered and the number of students in them. In the case of the Deakin EdD the numbers had grown from eight to eighty.

Contribution of the article to the Folio

Given that the thesis for this Folio is that teachers need continuing professional development in information and communication technology, this article discusses what could be an area of future investigation.

A rapidly growing interest in Masters level programs was a starting point for my research for this study. Given how circumstances have changed since 1995, the graduates of such programs might now consider a Doctorate. Certainly this was the area of interest expressed by the educational leaders I interviewed in South Australia. Details of the findings from these interviews are in Chapter 6 in Part C of the Folio.
From a personal point of view it was very rewarding to be invited to submit an article to such a respected academic journal. It also gave an opportunity to reflect upon my experiences in the Deakin program and to use them to make suggestions for a New Generation Professional Doctorate.
Summary and conclusions

Overview

This section is a reflective summary because it not only looks at the ground the researcher has covered, but looks forward to the research activities of the Dissertation.

Even though Part B is a collection of pieces of different forms of academic writing and reporting, each of the studies has made a significant contribution to the Folio. Together they complete their own separate jigsaw puzzle, which becomes part of the overall one, the Folio. They give an overall picture of the changes in and my role in helping to provide this assistance. They are held together by the theme of ‘Making ICT work for all’ and establish the thesis that there is still a need for PD in ICT.

Elective Research Study 1

This collection of conference papers cover the whole period of my candidacy. They not only trace the developments and changes in modes of delivery of professional development, but their actual presentations reflect the dramatic developments in ICT hardware and software, their use in education and my own expertise. The papers show my own personal growth as a writer.

My paper at WCCE 90 was a flimsy, poorly referenced document. The presentation used a series of typewriter-generated OHPs. By WCCE 2001, there was a paper of journal length and quality. The presentation was from a CD-ROM, which contained text, images, sound and video. The paper was available from my website or on a very small CD-ROM inside my business cards.

Elective Research Study 2

This study first looked at professional development scene here in South Australia It described two state-wide funding projects that provided assistance for hundreds of teachers, mostly in country regions. It was apparent from feedback and discussions with teachers that there was an urgent need for professional development, but there
was general dissatisfaction with existing models. It was obvious that research had to
be conducted to establish just what were these needs and how could they be best met.

The second section of this study gave an overview of the deliberations and findings
of the IFIP Working Party on teacher professional development in ICT. These
revealed that the need for professional development was a world wide one and that
many existing models had proved to be not as effective as they could have been.

**Elective Research Study 3**

This study which took the format of a submission of a journal article, provided me
with opportunity to research and write about the next stage in formal training for
educators, particularly those in more senior positions. In my years at the Northern
Territory University (1986-1995) I had overseen the progression from the BEd, to the
Graduate Diploma and then the MEd. From my research activities with senior
officers, it became apparent that they were interested in an EdD. To write this article
and complete another piece of the jigsaw puzzle, I conducted a search of the
literature on the subject and supported these findings and my own personal
experiences, with comments from fellow doctoral students.

**Conclusions**

Part B has presented an overview of developments in professional development in
ICT over nearly a decade. It started from the local scene in Darwin and then moved
to the South Australian scene. From here it then looked at the Australia wide picture
before concluding with the international scene from IFIP Working Party 3.5 at
WCCE 2001. It has followed the transition in post-graduate education from the
Graduate Diploma to the MEd and ends with ideas for an EdD.

**Research issues for the dissertation**

The synthesis of the conclusions from the professional development activities, which
are described in Elective Research Studies 1 and 2, indicated that even though more
teachers were using ICT effectively, there appeared to be many teachers, particularly
in country regions, who still lacked the expertise to do so. From working with ICT
co-ordinators in the country professional development program described in Elective
Research Study 2, it was obvious to the researcher that very few of these key teachers had any formal qualifications in this field.

However there was no South Australia wide data which would quantify the current level of expertise or qualifications and hence establish if there was a still a need for professional development in this field. This situation led to the state-wide survey, which is described in Chapter 5 in the Dissertation.

Part B of this Folio has, therefore, provided another piece of the jigsaw puzzle. It has given background material, which describes the researcher's role in providing professional development from 1995. It gives an overview of developments in models of professional development at a local and intentional level. It established that there was need for an investigation of the ongoing professional development needs of teachers in South Australia and that further research had to be conducted to establish more clearly what was the national situation.
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PART C

THE DISSERTATION

This section, which is the third of the three elements that make up the Folio, contains details of the major research study carried out. The Dissertation investigates the current needs of Reception to Year 7 teachers for professional development in classroom uses of Information and Communication Technology and in particular the demand for a Masters level program in this area.
Teacher professional development In Information and Communication Technology

An investigation of the needs of teachers in South Australian Government Reception to Year 7 schools

Owen T.S. Burgan
MEd, B A, Grad Dip Ed Computing, Dip Teach

Dissertation

Faculty of Education
Deakin University

December 2001
Chapter 1

Introduction

1.1 Overview

The purpose of this brief chapter is to introduce the dissertation. It identifies the area in which the problem is located and gives a succinct statement of the problem and the rationale for undertaking the investigation. Then there is a concise statement of the overall aim of the study. A series of underlying contentions and hypotheses are then discussed. This leads to an outline of the objectives of the research and the questions to be examined. The chapter ends with an outline of the research approach used in order to achieve the stated aim of the investigation.

1.2 The problem to be investigated

Over the past twenty years ago there has been a significant increase in the number of computers in Australian schools. The following instances give a clear indication of the scale of this increase.

A 1985 survey by Hancock (cited in Smith 1987), found that the average number of computers in schools, which had them, was only eight. A national survey by Kershaw and Webber (1991, p. 101) reported that ‘16% of schools surveyed had in excess of 60 computers each.’ In 1983 there were only 250 computers in the whole of the Northern Territory (Barnsley 1983, p. 100). By 1990 this number had increased to 2000 (Burgan 1990, p. 1). In 1986 Sandery reported that South Australia had one computer for every 25 students. In 1996 the State Government announced that by 2001 there would be one computer for every five students in state public schools (Crouch 1996, p. 7). By 2001 this target had apparently been reached (Richardson, K. 2000, pers. comm., 2 March).

The impact of this movement has been that ‘teachers are facing the biggest changes to education practice in history’ (Travers 2000, p. 12). Only just over a decade ago, Burgan (1988, p. 3) observed that: ‘Most computers were grouped in a single room
under the supervision of a computing co-ordinator. Students came to the room to do “computing”, but not usually with their class teacher. By 2001 all teachers in state schools in South Australia will be required to be using information and communication technology (ICT) to teach a significant part of their lessons (Lucas 1997, p. 4). Using contemporary jargon, teachers will be required to be “ICT Smart”.

In 1998, as part of the dissertation research, anecdotal evidence, results from a small-scale survey, and feedback from ongoing state-wide professional development activities were assembled. It appeared from this evidence that a significant number of teachers did not have the skills, knowledge, or inclination, to meet this requirement. There was no state-wide data available at the time to support this perception of the need for professional development in this area. This lack of information seemed to represent a serious gap in the knowledge required if all teachers were to be required to be “ICT Smart”. This then appeared to be a problem requiring urgent investigation.

1.3 Aim of the investigation

The aim of this investigation, then, is to investigate the professional development needs of Department of Education and Children’s Services (DECS) Reception to Year 7 (R-7) teachers in South Australia in relation to classroom uses of ICT.

1.4 Underpinning premises

This whole investigation is based on the acceptance that these three premises will impact on the results obtained.

The first is that the major data collection for this investigation was a statewide survey of all DECS R-7 was conducted in 1998.

The second is that it is inevitable that ICT will have an even greater impact on education and teachers. In the early-1980s the question was, Can you use a

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48 There needs to be a follow–up study to find if this goal has been achieved.

49 The Strategic Planning Division of the SA Department of Education and Children’s Services considered it so important that it provided the funding and the support structure to enable the researcher to conduct the state-wide survey which is described in Chapter 5.
computer? By the mid-1980s we were talking about The Golden Opportunities. By the late-1980s we were On the Crest of a Wave. By the end of the 1990s the slight swell of the movement in the 1980s had become a tidal wave. Hence, the significance of the title of this Folio.

The third is that the Department of Education and Children’s Services and most, but not all, teachers have already responded to the challenges this inevitable movement has presented.

1.5 Underlying contentions and hypotheses

Before the objectives of the research for the investigation could be determined, a series of contentions and hypotheses had to be formulated. This investigation tests two hypotheses that are underpinned by four basic contentions about the impact of ICT on education and consequently on teacher professional development in this field.

These contentions and hypotheses were formulated from my state-wide experiences in both the Northern Territory and South Australia where I talked with teachers, observed what was going in schools and provided professional development. I also drew on ideas and materials, which I had gathered from teachers and academic colleagues in all other states and in several overseas countries. Finally I used the findings from the analysis of the extensive preliminary review of the literature conducted in the preparation of the Proposal for this investigation.

I consider these contentions and hypotheses will have a direct bearing on the research to be carried out because the research questions were developed from them.

The contentions

- ICT has already had a significant impact on education and teachers’ professional lives
- All DECS teachers will be required to be “ICT Smart”
- At present not all of these teachers have the necessary knowledge and skills to achieve this goal
- Those who haven’t will need assistance in the form of professional development.
The hypotheses:

- There is an urgent need for professional development, particularly in country regions
- Existing strategies used to provide this assistance need to be replaced by more effective ones.

1.6 Research objectives of the investigation

From these contentions and hypotheses this list of objectives was drawn up:

- To provide a background to current teacher professional development in ICT
- To determine if teachers still need assistance
- To identify, if this is so, specific needs
- To assess existing models at the workshop and the Masters levels
- To provide, if required, suggestions for alternative models
- To make recommendations for areas of further research

These research objectives then lead to a series of research questions, which were developed to facilitate the collection of data.

1.7 Research questions for the investigation

These questions were developed to facilitate the data collection process. The data when organised, interpreted and analysed will enable the contentions and the hypotheses they underpin, to be either disproved or supported.

- Is there a need for professional development?
- If there is, what are the areas that need to be focused on?
- How can these needs be met?

1.8 Organisation of the dissertation

The following is a summary of the chapters of the dissertation, which will serve to realise the aim of the study.
Chapter 2 gives an account of the origin, the context and the significance of the problem. It discusses why the research study area was chosen and how the problem was identified.

Chapter 3 describes the research strategies and procedure devised and implemented by the researcher to solve the research problem. These include: a review of the literature; a state-wide mail-out survey; a series of focused interviews; and a survey of all existing coursework Masters level programs in classroom uses of information technology currently offered in Australia.

Chapter 4 gives an historical perspective of what other writers and researchers have found, along with an overview of the current theory and practice relevant to this study. This chapter serves to underpin the whole study and, in particular, provide direction for the subsequent research program.

Chapter 5 describes and presents data and findings from the researcher’s state-wide mail-out questionnaire-survey of all South Australian Department of Education and Children’s Services (Reception to Year 7) schools.

Chapter 6 reports on the focused interviews conducted at different stages of the study.

Chapter 7 discusses the results of the survey of coursework Masters level programs in classroom uses of ICT currently offered in Australia.

Chapter 8 discusses the overall research findings.

Chapter 9 presents a possible framework for the structure and delivery of a model coursework Masters level program in classroom uses of ICT.

Chapter 10 draws conclusions from the study and their implications, and makes a series of recommendations for future action as well as suggestions for further areas of possible investigation.

1.9 Concluding comments

This chapter has established that there is a significant problem in educational practice and it requires investigation. The problem statement is located in the context
of the overall research. The statement of the aim of the investigation emanates from this, and accordingly, is linked to the outline of the research approach used to achieve this aim. The research to be conducted enfold from my belief that the problem to be investigated is a significant one, which is seemingly unrecognised. The thesis that underlies the Dissertation and the whole Folio is that teachers do need professional development in classroom uses of ICT. Hence the titles of both the Dissertation and the Folio.
Chapter 2

Statement of the problem

2.1 Overview

This chapter gives an account of the origin, the context and the significance of the problem. It discusses why the research area was chosen and how the problem was identified. It then looks at the critical criteria applied to the problem so that a decision could be made that, not only would the proposed research study make a significant contribution to knowledge in this field, but that it was possible to successfully carry out the study. It concludes with a concise statement of the problem to be investigated.

2.1.1 Area of study

This study is located in the researcher’s area of interest and activity—professional development for primary school teachers in classroom uses of Information and Communication Technology.

2.1.2 Why chosen

The following comments from a newspaper report of an interview in 1996 with Mr Lucas, the Education Minister in South Australia, in response to his earlier announcement that he aimed to have one computer for every five students by the year 2001, highlight the need for research in this area.

Under a far-reaching program announced today all teachers in DECS schools will be expected to be using IT to teach a significant part of their lessons within two years. The program comes as teachers are facing intense pressure to adapt to the computer revolution. Students are a long way ahead of some of our teachers in terms of their computer knowledge base and familiarity with technology. One of the reasons why we have had to do this is that IT is a completely new ball game for a number of our teachers. (Lucas, p. 4)

In response to the Minister’s comments, Dr Wing Au, senior lecturer in educational computing at the University of South Australia, replied:
Many of our teachers, including key teachers and principals grew up just ahead of the computer revolution. Many, especially those in their mid-30’s, have missed out on basic training in computing and other areas of what has been an extremely rapid technological development. (Au, p. 4)

The following statements from the preamble to ‘Gateways - Information Technology in the Learning Process’, which was a project in 1996 of national significance funded by the Department of Employment, Education, Training and Youth Affairs, provide current evidence of this need, and provide the rationale, for this study.

Information technologies have been in use in many Australian schools for at least the last ten years. Today’s technologies are essential tools in the learning environment. Yet the realisation of their potential in education has been spasmodic and variable. The challenge is to move from isolated pockets of good practice to widespread application of Information Technology. Integral to this are well articulated IT policies, the provision of appropriate access to technology, adequate time for teachers to explore its use and access to high quality professional development. (Gateways, p. 6)

The need for such activity is not merely a current phenomenon, associated with the dramatic improvement in the ratio of computers to students in schools. The following comments in 1990 by Osborne as coordinator of the Diploma in Information Technology in Education, delivered by the Centre of Educational Studies in the University of London, offer a solution which provides the focus for the need for this study.

At present the majority of teachers using Information Technology are self-taught, having attended at the most introductory short courses. The shortage of relevant educational computing knowledge amongst teachers is due to many factors. The solution to the dilemma lies in providing courses, which will enable them to use information technology methods and resources in their teaching and to give encouragement, support and advice to others who also wish to. (Osborne, p. 32)

The solution offered by the Mr Lucas, in the interview cited above, was to fast-track a “crash course” in computer training because many students’ computer skills were “light years” ahead. These courses, which this researcher referred to in a conference paper (Burgan, 1990), as “the one day horrors”, did not work over a decade ago because they were too short, too intensive and purely skill based.
2.1.3 Contribution to research and practice

In light of the DECS requirement that by the Year 2001 all teachers must have appropriate IT skills, this study will make the following contributions:

- It will provide base-line data of the existing needs of classroom teachers for professional development in IT.
- It will provide an historical perspective of the models used to meet these needs.
- It will provide what appears to be the first survey of existing coursework Masters level programs in this area in Australia.

The graduates of the proposed masters level program will provide the educational leadership identified by Norman (1996) in his survey carried out in South Australia. This conclusion from the survey supports the need for this study and suggests the role, which could be played by the teachers who are graduates of the proposed program.

One of the biggest problems most teachers have is lack of time, energy and resources to improve their own IT skills. We need to develop strong curriculum leadership and support in this area. (Norman, p. 13)

These teachers will be able not only to be exemplar role models but also able to provide situated professional development or workshops in hub groups or at conferences.

2.2 Background

In a keynote address to the A.C.E. Conference in Adelaide in 1995 Morrow, Chair of the Schools Council for NBEET, spoke at length on Information Technology as a fundamental tool of learning. She stressed the need for teachers to be able to use seize the educational opportunities offered by the obvious motivational strength of Information Technology. She concluded that:

And while it is doubtful that every teacher in a school will have to acquire very advanced computer skills, no teacher can afford to ignore the potential of the technology to enhance their teaching. (Morrow, 1995, p. 8)
This conclusion is at the centre of the need for this study. Observation and informal data gathering has indicated that many primary school teachers do feel that there have already been significant changes and that ‘like newly purchased class textbooks they are also now obsolescent. Others are settling into the roles of ‘coach’ or ‘mentor’ with relative ease’ (Morrow, p. 9). This study hopes to make it possible to enable the ‘many’ to become the ‘others’.

2.2.1 Why this area was chosen

In the last decade not only has the number of computers in primary schools increased dramatically but as well the ratio of pupils to computers has fallen from 1:50 to a goal of 1:5 by the turn of the century. Unfortunately not enough teachers are using them to enhance the teaching and learning environment in their classrooms. Anecdotal evidence suggests that the problem here in Australia is still a significant one.

A study in 1992 by Marcinkiewicz of elementary teachers in America reached disturbing conclusions. ‘Most teachers will not adopt the use of computers even if computers are available and it is believed that they can improve the quality and quantity of teaching’ (Marcinkiewicz, p. 220). This was such a small survey (n=170) from only elementary schools and it was in 1992, but if nearly half were not using computers at all in the classroom, why not, and how can the situation be redressed?

No such data exist here in South Australia, hence the reason for conducting a survey of all DECS R-7 schools to establish the need for Professional Development activities. A small scale survey carried out by Norman in 1996 revealed the highest response was for activities with a practical basis, show and tells, demonstrations, software training and classroom integration. The DECS requirement that by 2001 all teachers must have appropriate ICT skills has significance for this study because teacher graduates of the proposed program will be in a position to provide situated professional development, or through local hub groups.

2.2.2 Contribution to the research knowledge

There is a volume of anecdotal and research reports on pre-service and in-service teacher education programs, but very few refer to the postgraduate sector. Perhaps
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this is because training in Information Technology has not been obligatory for all students in Faculties of Education. The integration of computers into the everyday life of the average student in the Faculty of Education has been a slow and drawn-out process, which has followed, rather than led, the process in the schools.

Speaking of this movement Bigum (1990, p. 77) said:

Institutions with teacher education programs responded, albeit slowly, to the perceived needs of teachers and would-be teachers. Just as the schools assimilated computing into the curriculum by creating space for subjects like computer awareness, so too, in teacher education, subjects were created in the name of educational computing.

Paralleling, but coming after, the dramatic increase in computers in schools in the mid 1980s, there were significant developments in Faculties of Education to provide appropriate courses designed to train pre-service teachers in the application of appropriate information technology (IT) to teaching and learning.

As a consequence of this perception that many teachers lacked confidence and competence in this area in-service programs were set up to help teachers cope with the ever-increasing demands of IT. These programs provided instruction or training in the uses of IT. But, it was a misconception that teachers who were able to cope with simple tasks such as word processing, were then able to ensure IT was being used as a significant tool in the learning process, and one which was used to support the cross curricular approach.

Ragsdale (199, p. 161) outlined this situation very clearly.

Just as we can confuse knowledge with wisdom, so can we confuse being able to use a computer tool successfully with being able to apply the tool successfully.

Graduate Diplomas in Educational Computing followed these undergraduate in-service programs. There are few of these programs still offered because more institutions are providing offerings at the Masters level. A search of the 1997 edition of *The Good Universities Guide* revealed that there are only 10 and none of these is in South Australia.

A preliminary informal survey of computer using classroom primary school teachers in the Darwin urban area in 1995 showed that most felt they had the expertise to
effectively use computers themselves for basic functions. Unfortunately they knew little about currently available information technology as multimedia presentation tools, scanners, digital cameras and the Internet. This need was revealed by the over quota number of students enrolled in units in the Graduate Diploma in Educational Computing. As a result the researcher was asked to produce a strand of three units for a specialisation within the new MEd program which replaced the Master of Educational Studies.

But intensive literature searches have revealed that very few studies have been conducted with students in postgraduate teacher training programs. Hence, one of the purposes of this study is to discover and describe the current state of postgraduate education, at the Masters level, in the area of IT.

2.3 Identifying potential problems

The researcher began the task of selecting a potential problem to be studied by adopting the advice given by Tuckman.

From the infinite number of potential problems for study, it is wise for researchers to narrow the range to problems that correspond to their interests and skills. (Tuckman, 1988 p. 27)

The researcher used Tuckman’s three-dimensional model (Tuckman, p. 28) for problem consideration to construct his own model. His area of interest came from his work-based situation as co-ordinator of Educational Computing in the Faculty of Education at the Northern Territory University, and from his involvement with professional activities as President of the Computer Educators Association of the Northern Territory. He established that he was primarily interested in professional development in IT for Reception to Year 7 classroom teachers.

The three component model, which is shown below is based on that used by Tuckman (1986, p. 28).
When the researcher began his search of the literature on Professional Development and Teachers and Computers Uses in Education, there was so much published material that it did not appear to be an area that required further study. Closer investigation revealed that most of the studies related to undergraduate or in-service type programs. There were fewer studies at the postgraduate level and very few of these related to the Masters level.

Only a handful of studies investigated the impact of current and future Information Technology on students in postgraduate teacher training programs. Hence the decision was made to narrow the focus of this study to this area which did not appear to have been explored.

### 2.4 Identification of the problem

The problem to be investigated in this study came from the researcher’s involvement for over a decade in the field of in-service and pre-service professional development for teachers in classroom uses of information technology. The research methodology and methods to be used were obtained from his coursework units in his MEd and EdD.

### 2.5 Statement of the problem

By 2001 all teachers in state schools in South Australia will be required to be using ICT to teach a significant part of their lessons. When data collected from anecdotal evidence, results from a small-scale survey, and feedback from ongoing state-wide professional development activities were assembled, it appeared from this evidence...
that a significant number of teachers did not have the skills, knowledge, or inclination, to meet this requirement.

There was no state-wide data available at the time to support this perception of the need for professional development in this area. This represented a serious gap in the knowledge required if all teachers were to be required to be “ICT Smart”. This appeared to be a problem requiring urgent investigation.

The purpose of this investigation is threefold:

- The first is to establish if R-7 teachers feel there is a need for professional development at the workshop level and at the Masters level
- The second is to examine existing programs
- The third is to produce a framework for a program, which will meet the specific needs of those teachers.

2.6 Criteria applied to the problem before proceeding

Tuckman considers that the two overriding factors to consider in the selection of the problem are its pay-off and practicality (Tuckman, p. 37). Is the research problem significant enough to be studied and can the researcher successfully carry it? In simple terms is it ‘worth doing’ and is it ‘do-able’?

Having chosen the problem and stated it clearly he then suggests the researcher apply the five following criteria before continuing with your study. These critical criteria are workability, critical mass, interest, theoretical value and practical value (Tuckman, p. 36).

The researcher then designed this set of questions using Tuckman’s model.

2.6.1 Researcher’s criteria

A Workability

- Is the proposed study within the limits of his resources and time constraints?
- Will he have access to a large enough sample?
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- Can he expect he will find an answer to the problem?
- Is the required methodology manageable and understandable?

**B Critical Mass**
- Is it worth doing in terms of its magnitude and scope?
- Are there enough potential results?
- Will there be enough to write about or present a paper or a workshop?

**C Interest**
- How does it relate to his own background and current work situation?
- Why is he interested? Will it improve his own work practice or promotion?

**D Theoretical value**
- Does it fill a gap in the literature in the field?
- Will any one else think it is important?
- Will the findings be publishable?
- Could it lead on to other related research?

**E Practical value**
- Are colleagues likely to be interested in the results?
- Will the solution to the problem bring about ‘better practice’?

2.7 **Rationale for the study**

The researcher then applied these questions to the problem he had selected. The results of that application, in conjunction with the factors outlined in the section ‘context of the problem’, form the rationale for the study.

2.7.1 **Questions to be applied**

The following questions had to be answered by the researcher before he continued with the study.
A  **Workability**

What the researcher wanted to study was within the limits of his resource and time constraints. Restricting the study to R–7 computing co-ordinators in South Australia gave a population of approximately 450. This would provide sufficient responses for the survey to be viable.

The methodology was manageable and would be understandable to the subjects.

The researcher felt an answer to the problem could be reached because the data obtained from the first two stages would provide the directions for the final stage, the production of the framework for a program which would meet the needs identified earlier.

B  **Critical mass:**

The problem was of sufficient magnitude and scope to fulfil the requirement that motivated the study in the first place. The findings were such that they were publishable either as conference paper or a journal article. The outline for a proposed course could be adopted immediately.

2.7.2  **Interest**

Because of his background of over a decade in the area, his part-time employment in the field by the University of South Australia and his current involvement as chair of the professional development committee for the Computers In Education Group of South Australia, the problem and its solution are of significant interest to him. His own postgraduate academic career area from a Grad Dip in Educational Computing to his MEd and his membership of the Australian Society for Computers in Learning in Tertiary Institutions, the Australian Council for Computers in Education and the Australian Computer Society, have focused his attention in this area. He has been able to present refereed papers at state, national and international levels.

The higher level research skills acquired and the detailed knowledge gained from this doctoral study will stand him in good stead for future redeployment as a lecturer or supervisor at the post graduate level or for employment in a related field or in a position as a consultant.
2.7.3 **Theoretical value**

An ERIC search, conducted with the assistance of the Deakin Library Research Staff, using the terms, Higher Ed, Teacher Ed Programs, Computer uses in education and Masters level, located only a handful of papers.

Apart from the studies by Freyd (1986) and Murphy (1988), professional development in IT at the Masters level, appears to be an area not covered extensively in the literature. Similarly an examination of the contents of the proceedings of the more than twenty state, national and international conferences attended by the researcher in the last decade, revealed no papers in this precise field of study. This part of this study would therefore appear to fill a gap in the field.

In a logical progression in postgraduate provision, Australia is set to follow the U.S. in the demand for Masters level courses in this area. The review of existing courses will provide for the first time a baseline data-base.

2.7.4 **Practical value**

The solution to the problem will improve educational practice because the graduates will the enhanced skills and expertise to be able to be agents of change because they will not only be exemplar role models but will also be mentors who can provide opportunities for collaborative learning. The report on the decade long, Apple Classrooms of Tomorrow project concluded (*Teaching, Learning and Technology*, p. 6), that such ‘situated professional development is a powerful agent for change when teachers see other teachers and students successfully engaged in the routine use of technology’.

Teachers who complete the program envisaged in this study will be in a position to offer a leadership role in their own schools and districts. They will have a formal qualification with its status and promotional factors. They will have the latest research knowledge in the field. They will be able to promote the successful integration of IT by empowering their own colleagues and through a wider arena at professional association level and at conferences.

Classroom teachers, lecturers in Faculties of Education and other professional associations have already expressed interest in the outcomes of the study. The
researcher was involved in producing a successful submission for funding in his role as chair of the professional development committee for the Computers in Education Group of South Australia.

The Council of Educational Associations of S.A., in promoting its leading edge professional development program, also aims at producing ‘best practice’ in classrooms. This will be done by using modelling and involving participants in a cyclic and continuous process of change that includes reflection on current practice to identify areas where change should be made, accessing and evaluating new learnings and strategies, implementing these new learnings into practice and ongoing reflection.

2.8 Rationale for focus on Masters level programs

How can R-7 classroom teachers obtain the skills and knowledge to be able and willing to use IT to enhance the learning and teaching in their classrooms and then in the wider environment?

The solution lies in the successful implementation of the integrated use of IT. The next section discusses the theory behind these changes and how the teachers who complete the envisaged Masters level program will be able to achieve this by example and providing collegial assistance. The program itself will make available and deliver appropriate professional development irrespective of geographical location.

In the past decade there has been a dramatic increase in the number of students undertaking postgraduate studies in education at Australian universities. Current figures cited in the 1998 Directory of Postgraduate Study indicate that approximately 20,000 enrol each year. Professor Adey, Dean of the Faculty of Education at the University of South Australia, in his introduction to the section on Education made these comments which support this researcher’s decision to focus on Masters level programs, rather than the ever decreasing Graduate Diplomas which had been popular for over a decade.

Current figures indicate that approximately 20,000 students annually undertake postgraduate studies in the field of education in Australian Universities. The ongoing professional development of educators is an essential element of a vibrant and relevant teaching and learning system.
The majority of postgraduate study is within coursework programs. The 1996 Higher Education budget foreshadowed the progressive introduction of fees for postgraduate coursework degrees. This will result in changes to course profiles with less emphasis on Graduate Diplomas. (Adey, p. 128)

2.8.1 The end ‘product’

It is anticipated that the program, which is envisaged as the final stage of this study, will produce graduates with the following attributes.

- A Masters level qualification with its academic status, professional higher standing and opportunity for promotion
- Leaders who will operate from an informed research position and be able to enlighten and empower their colleagues
- Agents of change and/or innovators who will be able to promote the successful implementation of IT through participation in conferences: real and virtual, hub groups and professional association activities.

2.9 Restatement of the problem

At the suggestion of Tuckman (1988, p. 32), this chapter is concluded with a restatement of the problem to be investigated.

By 2001 all teachers in state schools in South Australia will be required to be using ICT to teach a significant part of their lessons. Preliminary research indicates that a significant number of teachers do not have the skills, knowledge, or inclination, to meet this requirement. There is no state-wide data available to support this perception of the need for professional development in this area. This appears to be a problem requiring urgent investigation.

2.10 Concluding comments

This chapter has given an account of the origin and the context of the problem. It has shown why the research investigation area was chosen and how the problem was identified. It examined the critical criteria applied to the problem so that the proposed research investigation would make a significant contribution to knowledge in this field. It concludes with a concise statement of the problem to be investigated.
Chapter 3

Research design

3.1 Overview

This chapter provides an outline of the research strategies devised and gives appropriately detailed statements of the actual steps undertaken in each stage of the investigation.

3.2 Introduction

The research investigation begins with an examination of the researcher’s workplace with particular reference to the professional development of experienced classroom teachers. The researcher has drawn on personal experiences and on those with a wider background. These experiences, combined with site visits and various forms of electronic communication, helped to first mould and then reshape the research as it developed.

In the course of considering general design issues, the principle put forward by Robson (1993, p. 38) was adopted that the research design is concerned with turning research questions into projects. The strategies and methods used in carrying out research depend on the type of research question being addressed. Robson considers that the process is analogous to the strategies adopted when crossing a river.

The task of crossing the river corresponds to the general research focus. Specific research questions are analogous to asking how many people want to cross the river: the frequency with which they want to cross: the current of the river, etc. The choice of the research strategy is akin to a choice between swimming, walking, flying or sailing across. The research tactics (or methods of investigation) concern the particular type of boat, bridge, aircraft etc. (Robson, p. 38)

The framework adopted to construct the research strategy is based upon that suggested by Tuckman (1988, p. 330). It uses a set of categories to describe the research methodology which outlines the general research design and then the methods and procedures to be used. Each of these categories then becomes a
Discussion of the methods used is presented in the chronological order in which they were employed.

### 3.3 Approaches to the research

The procedure adopted used more than one research strategy. It was broadly a qualitative and interpretative approach incorporating survey research methods with the focus. It used a process of cyclic revisiting because specific strategies not only arose from the previous strategy, but also tended to enrich and illuminate the findings from that previous one. For example, it was only after the review of the literature that the researcher was able to frame the structure of the survey and the interviews.

The approach adopted encompassed an in-depth review of the relevant literature, a mail-out questionnaire-survey, a series of interviews using a range of techniques, and a survey and analysis of existing coursework Masters level programs in the classroom use of ICT. In addition, non-participant observations on site visits to schools and other educational institutions helped to establish the need for the investigation and provided accounts of successful practice and new methods of delivering professional development for teachers.

### 3.4 Data collection methods

A variety of data collection methods was used throughout the period of the research investigation. Methods included direct observation, interviews, self-reporting methods and a group of methods, which Robson (1993, p. 269) referred to as unobtrusive measures or indirect observation. These included documentary, content and archival analyses. Although Robson (1993) expressed reservations about using such methods as the sole method of investigation, he concluded that:

> They do appear, though, to have considerable general usefulness when conceptualised as a complement to the use of other methods. (Robson 1993, p. 269)

During the process of data collection, the researcher “revisited” original material. Consequently, the reporting and writing-up of outcomes of each research stage became part of the cyclic nature of the overall research process. The collection of data was carried out through specific methods.
These included: an analysis of the relevant literature; recorded interviews with leading figures; a mail-out questionnaire–survey sent to all Department of Education and Children’s Services, Reception to Year 7 schools in South Australia; obtaining details of existing coursework Masters-level programs in classroom uses of IT and e-mail correspondence with respondents to the survey, workshop participants and with co-ordinators of MEd programs. The gaining of feedback from participants and respondents and the incorporation of changes in the data brought about by this, helped to enhance the collaborative and cyclic nature of the research.

The four stages in this approach were the review of the literature, the administration of the questionnaire–survey instrument, the on-site observations and interviews and the comparative analysis of existing MEd programs.

Because the investigation involved people, the researcher adopted Robson’s advice to find out what they could tell him about themselves.

One important category of enquiry method is based on asking people questions, or otherwise getting them to respond, and then getting a record of their responses. (Robson 1993, p. 226)

The two major self-reporting techniques used to achieve this were the interviews and the questionnaire–survey.

The first step was to establish if there was a need for professional development in classroom uses of information technology. Ragsdale (1991), in speaking of preparing teachers to be able to successfully implement information technology in their classrooms, stressed that the first step was to determine their needs. He concluded that needs assessment is not a clear-cut process.

It must be acknowledged that the definition of ‘need’ itself is in dispute, the determination of needs is usually subjective, and the entire process of assessing and meeting needs is heavily influenced by values. (Ragsdale 1991, p. 162)

Scriven and Roth (1978), and Guba and Lincoln (1982) also voiced this note of caution about the concept and practice of needs assessment. Wideman (1990) in his study of a needs assessment for implementing new technology focused on questions like ‘What is holding you back?’ and ‘What would help you?’ This is relevant to this investigation because it is concerned with ultimately bringing about better practice.
Ragsdale (1991) made this conclusion to his report on a five-year-long study of the professional development needs of elementary teachers.

In order to develop professionally, teachers must be motivated and this can only occur when the development process leads to skills that the teachers themselves have determined to be important. (Ragsdale, 1991, p. 162)

A quantitative analysis of data collected from a state-wide survey was carried out to establish, in general, what were the professional development needs of Department of Education and Children’s Services, Reception to Year 7 teachers in classroom uses of information technology. As well, it established if Information Technology coordinators felt there was a need for a coursework Masters level program in this field.

3.5 Review of the literature

3.5.1 Identifying relevant sources

The aim of the literature search was to investigate what had been done in the past in the general area of professional development in classroom uses of information technology. It was not only to be a source of data but was to serve to identify issues and questions and successful strategies used by other researchers. As such it would underpin the rest of the investigation as it would provide base-line data and suggest directions for further research.

The literature review was an on-going process, which relied on the emergence of additional themes and issues during and after other forms of data collection. Hence, it became part of a cyclic process leading to an expanding list of relevant themes and issues.

There has been extensive research into benefits of programs at the pre-service, undergraduate level, but few studies related to postgraduate students in Faculties of Education. It was not feasible to complete the literature review until after the data collection and analysis from other parts of this current investigation were completed because they revealed that there was a need to examine more specific areas of the literature.
An initial ERIC search using the descriptors ‘computers uses in education’ and ‘teacher education programs’ as key terms revealed the need to be very selective in determining the specific areas of literature to be included in the search. Hundreds of references were located, but very few of them were relevant to this current investigation. A more directed search, using the added descriptors ‘elementary’ and ‘Masters level’, located only one article, by Freyd (1988) which was directly related to this investigation.

It was not feasible to complete the review of the literature until after the other data collection procedures were completed and the data was analysed. The results of this analysis revealed that there was to examine more specific areas of the literature. Hence this reiterative process was also part of the cyclic nature of the overall research.

3.5.2 Analysing materials

The researcher looked for trends or issues, which provided the basis for other forms of data collection such as questionnaires, surveys, observations and interviews. There were also specific questions, which were included in the other forms of data collection, in particular for the interviews and the questionnaire-survey. The researcher was seeking models, which other researchers had used that could be applied in a modified way to this investigation.

After close reviewing, a selection was made of those books and articles which appeared likely to make a significant contribution to the investigation. Copies of these were obtained and the citations of these sources, with a brief summary, were recorded using the bibliographical software EndNote. Finally, all summaries located under a particular heading were re-read, analysed and annotated. These “libraries” enabled all the relevant literature under a particular heading to be analysed both independently and as a whole.

Overall the purpose of the review was to alert the researcher to any gaps in the literature as well as to discover what other researchers had found. The researcher needed to build on the body of knowledge the researcher already had from their own professional and academic activities. The issues and trends identified would help
substantiate the thesis for this investigation and provide a clearer sense of direction for the rest of the research still to be conducted.

### 3.6 Questionnaire–survey

The term survey is used in a variety of ways, but commonly refers to the collection of standardised information from a specific population, or some sample from one, usually but not necessarily by means of a questionnaire or interview. (Robson 1996, p. 49)

#### 3.6.1 Aim of this survey

The aim was to establish, in general, what were the professional development needs of Reception to Year 7 teachers. In particular, the survey sought to establish that if teachers did require assistance, what were their specific needs.

#### 3.6.2 Selection of the sample

The researcher had to choose a representative sample, which was not biased. The decision was made to survey Information Technology co-ordinators in all Reception to Year 7 Department of Education and Children's Services schools. The sample included all Junior Primary, Primary, Area and Aboriginal schools.

This population (n=476) was sufficient to provide a large enough sample to ensure that statistically there could be a high degree of confidence in the situation as it applied to the total population.

#### 3.6.3 Discussion of this type of survey

Robson (1996, p. 123) stated that, while it was difficult to define a survey concisely, most people had a common sense appreciation of what the term means because of the wide spread exposure they have to surveys of different kinds. He concluded that the following were the central features of the survey strategy.

It enables the collection of a small amount of data in standardised form from a relatively large number of individuals and the selection of samples of individuals from known populations. (Robson 1996, p. 124)

The type of survey utilised for this investigation was cross-sectional because the focus was on the make-up of the sample and establishing the situation in the overall
population at the time of the administration of the survey. Data were collected over a period of several weeks due to the practicalities and time constraints in carrying out a state-wide survey.

This survey research was carried out, firstly, to obtain a quantitative picture of the individuals sampled from the known population and secondly, to gain an understanding of that population itself.

Data collected from this part of the investigation was descriptive in nature. The researcher was seeking to determine how many people in the given population (i.e. teachers in South Australian Reception to Year 7 schools) possessed appropriate expertise in the area of classroom uses of information technology. The survey data were to be used to test the conception that the majority of classroom teachers did not have an adequate level of expertise. The focus was not on the individuals themselves, but on generalisations drawn from the total sample and hence generalised to the total population.

3.6.4 Development and structure of the questionnaire

The survey focused on the need for professional development at the workshop level and the demand for a coursework Masters level program in Classroom Uses of Information Technology. The questionnaire-based survey instrument contained 20 questions divided into three sections (see Appendix C). It was modelled on one used by Duckett (1996) as part of his PhD research.

After the questionnaire was designed it was tested by asking a group of ten teachers, who were not potential respondents, to complete it and make comments about its structure and intended purpose. As a result minor changes were made to the layout and wording of the survey instrument.

Section A was designed to provide demographic data and to establish if there was a need for professional development in information technology. Specifically, it was designed to establish if there was a need for a coursework Masters level program in this area, and, if so, what units should be in it. Rating scales were used on the basis that:

Instead of using the standard set of response options, representing the degree of agreement, rating scales use descriptive terms pertaining to the factor in question (Hopkins 1990, p. 295)
Section B asked respondents to indicate what assistance and workshop activities they considered were most necessary for professional development in IT. They were required to rank their responses on a 5 point Likert-type scale. The Likert scale was selected because it is ‘perhaps the most widely used technique for attitude measurement. A statement or question is followed by a five point response continuum’ (Hopkins 1990, p. 292).

Section C gave respondents the opportunity to make any comments or suggestions either about the investigation itself or issues of concern.

3.6.5 Procedure for administration of the survey

This section describes how the researcher carried out the survey using a self-administered postal questionnaire.

The survey instrument, with an introductory letter and a Plain Language Statement (see Appendix C), was sent out by the Distribution Centre of the Department for Education and Children’s Services (DECS) to all schools in the sample. School principals were asked — if they agreed to participate — to pass the package on to their IT co-ordinators. These teachers were invited to participate in the investigation by completing the questionnaire and returning it with the consent forms via the DECS courier service within fourteen days.

Respondents were also advised that if they wished to participate further in the investigation, follow up visits would be made on request and in addition all participating schools would receive a copy of the CD-ROM to be produced as one of the outcomes of the overall research.

3.6.6 Organisation and analysis of data collected

The results of the survey were coded (see Appendix D) and entered into a response matrix (see Appendix D) set up using the quantitative analysis software package Excel. The matrix comprised 23 columns, each of which was headed by a question number and 135 rows, each of which was designated by a respondent’s number. The information drawn from the analysis was presented in a series of frequency table and graphs. As well there were four cross tabulation tables designed to show the possible relationship between one question and another. With the first of these a chi-square
test was used to confirm whether the two independent samples, country respondents and city respondents have significantly different distributions across the two categories, qualifications or no qualifications.

Responses from the questions which were not coded, due to their having free responses rather than fixed ones, were word-processed in a format that could be analysed using the qualitative software package NUD*IST.

3.6.7 Issues of reliability and validity

Establishing internal validity

It was essential that the data obtained were trustworthy—this is, that the information obtained about what the respondents thought, felt or believed was valid. Because over 95% of respondents agreed to participate in the investigation and supplied their names and contact details, it would appear that they were interested in the research issues and keen to be involved as informants. As well, great care had to be taken to ensure that all questions were clear, comprehensible and unambiguous.

Establishing external validity

The sampling resulted in a group of respondents (n=135). These respondents almost equally represented country schools (n=67) and city schools (n=68), which meant that findings could be generalised to the population.

A potential problem was that what respondents would actually do, their behaviours, would not be positively related to their attitudes as indicated by responses to specific questions. For example, if nearly 10% said they would definitely undertake a Masters level program, how many actually would? This problem was overcome by the follow up interviews with each of these respondents.

Establishing reliability

The survey instrument, a two-page questionnaire with twenty questions, was piloted with two samples, one city and one country, to ensure that the wording was unambiguous. Several changes were made before the final instrument was printed. The fact that all respondents were presented with the same standardised questions meant that it was possible to expect a high level of dependability of response.
3.6.8 Allocation of time

Figure 4 depicts the procedure and timeline for the survey. It is based on a timeline constructed by Robson (1996, p. 122).

<table>
<thead>
<tr>
<th>Step</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Production of ‘package’ to accompany questionnaire</td>
<td>2 weeks</td>
</tr>
<tr>
<td>2. Distribution and return of survey package state-wide</td>
<td>3 weeks</td>
</tr>
<tr>
<td>3. Follow up reminder letter</td>
<td>1 week</td>
</tr>
<tr>
<td>4. Construction of computer data entry and reporting package</td>
<td>1 week</td>
</tr>
<tr>
<td>5. Data entry</td>
<td>1 week</td>
</tr>
<tr>
<td>6. Follow up ‘thank you’ letter</td>
<td>1 week</td>
</tr>
<tr>
<td>7. Analysis and interpretation</td>
<td>3 weeks</td>
</tr>
<tr>
<td>8. Production of survey report</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

Figure 4: Procedure and timeline for survey

Because of the relatively small-scale nature of the survey, the initial design and construction took up a greater proportion of the time than the analysis and report writing. The project commenced at the start of February 1998 and was concluded by the end of June 1998.

3.6.9 Conclusion

The data collected from a properly conducted survey should provide what Lindblom and Cohen (1979, p. 4) called ‘useable knowledge’. It was envisaged that this knowledge could be used to convince those in positions of power and influence that there was a state-wide need for professional development in classroom uses of information technology, and that there was sufficient demand for a Masters level program in this field.

It should also satisfy what Hakim (1987, p. 48) referred to as the ‘accountability of the survey as a research strategy’. That is the report of the activity must contain a standardised description of the sampling and coding procedures, copies of introductory letters and plain language statements, the survey instruments and the raw survey data. This enables colleagues to have access to the methods and procedures used.
3.7 Comparative analysis of existing courses

3.7.1 Initial work

A preliminary literature search revealed that a number of postgraduate programs in computer education were offered in the United States before 1970. The first graduate level program identified was offered in 1979 by the University of Ulster (Murphy 1988, p. 149). The first Masters level program, which was identified by the researcher, was offered in 1984 by the Graduate School of Education at the University of Pennsylvania (Freyd 1988, p. 69).

A search of the 1997 Higher Education Course Directory and the 1997 Directory of Postgraduate Courses established that, of the 41 institutions in Australia, only 13 offered such programs internally or externally at the Masters level. 50 Brief details of these programs were obtained either by inspection of handbooks, written or email request to the institutions or by accessing web-sites. As well, copies of existing programs, which were representative of many more, were obtained from ten institutions in England, Canada and the United States.

3.7.2 Approach used

The approach used in the comparative analysis of the courses was similar to that used by Collis in her 1985 review of graduate courses in Computer Education offered by Faculties of Education in Canada.

Ekhaml (1985) conducted a similar study of United States universities which offered graduate degree courses in Computers in Education. Only 7% of the 65% of the universities that responded (50 institutions) indicated that they offered a Masters level course.

In Australia in the mid-1980s many Graduate Diplomas in Educational Computing were developed. These programs were supposed to train experienced classroom teachers, primary and secondary, in the application of computer technology to teaching and learning. After less than a decade, most of them were no longer offered.

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50 A review of these figures from an examination of the 2000 Good Universities Guide to Postgraduate Courses revealed that there then only ten such courses.
In a majority of cases they have been replaced by coursework Masters level programs.

The researcher conducted a survey in 1998 by of all Masters level coursework courses in this field, which were then offered in Australia. The survey was designed to provide baseline data for a continuing review of the structure and impact of these courses. Subsequently, the Deans of all Faculties, which offered such courses, were contacted and asked how details could be obtained of the content and structure of these programs and the backgrounds of the students taking them. These details were then subjected to a content analysis, which considered who were the intended students, what were the outcomes, what was the structure, what was the content and in what delivery modes were offered.

This analysis of this material was conducted using NUD*IST software to establish common features. Results of the analysis are discussed in Chapter 7.

3.8 Interview research

A major part of the study involved the collection of data through interviews conducted with leading figures in the field of technology-based education, both in Australia and overseas. In order to gain a richer variety of data, three different interview techniques were used. The first two were based on a questioning structure. Interviewees were supplied with a list of discussion points, which had been derived from feedback collected from the two state-wide professional development projects described in Elective Research Study 2 and from the review of the literature.

Although structured, additional questions were asked at times to seek clarification or to expand on a specific point. Each interview was recorded using an audio-tape recorder. Transcripts were produced for later analysis using NUD*IST software. The focus of all interviews was on perceived needs and successful models for professional development. The names of individuals were not used and they were identified only by a capital letter (e.g. Subject X). A descriptor of the position that each interviewee held is given.

The first set of interviews was with key individuals in South Australia, who were considered to be leaders in the field. They were contacted and asked if they were willing to be interviewed. The purpose was to establish common concerns and
suggestions. Each interview was prearranged in that interviewees were given a list of the questions to be discussed. Each of the interviews lasted between 30 and 60 minutes and was recorded for later transcription, interpretation and analysis. Handwritten notes were also taken so that they could be used later to help in analysing the data from the transcripts. If they were willing, permission was obtained from interviewees to include extracts from the transcripts in the dissertation itself. Interviewees were sent a copy of the transcript and asked to make any necessary changes.

The second set of interviews was with overseas experts after they had presented Keynote addresses at Conferences in South Australia that the researcher was involved in as a presenter and organiser. The method was less formal in that there was no set of advance questions. Notes were taken, and in one instance the interview was recorded for transcription. The interviewees were asked to talk about their experiences and how teachers could be helped and what had been successful professional development models. Because interviewees were from overseas, they agreed that the research should use the transcripts without referring back to them, but that they would be sent a copy of the CD-ROM version of the Folio.

The third set of interviews was with the respondents to the questionnaire–survey, who indicated they would definitely be interested in undertaking the proposed MEd program in ICT, the framework for which is the final product of this investigation. The potential interviewees were contacted personally by an initial telephone call and invited to participate in this stage of the investigation.

Even though the researcher was working on his own, he considered there was value in regarding this stage of the research investigation as a group process, which utilised the help of others. Accordingly, the structure for the third set of interviews was based on a modified version of the Delphi technique developed by DelBecq in 1975. Robson (1996) gave this description of the technique.

In this context it might mean getting together a group of persons, either those who are interested directly in the project or a range of colleagues with interests in the focus of the research. Each individual is then asked to generate independently up to three specific research questions in the chosen area. They may be asked also to provide additional information, perhaps giving a justification for the questions chosen. The responses from each individual are passed on in unedited and non-attributed form to all members of the group. A second cycle then takes place. This might
involve individuals commenting on other responses, and/or revising their own contributions in light of what others have produced. Third and fourth cycles might take place, either of similar form or seeking resolution or consensus through voting, or ranking, or categorising responses. (Robson, 1996 p. 27)

In this approach the researcher decided to utilise the expertise and experiences of the teachers who had responded to his questionnaire–survey. Those who agreed to participate were sent the survey information package. This contained a plain language statement and the results from Question 6: ‘Which mode of delivery?’ Question 7 ‘Ranking the units’ and Question 8 ‘Other units which could be included’. Each member of the group was asked to independently comment on the findings and to include any other observations or comments considered relevant.

The responses from each individual were collected and passed on, in an unedited and non-attributed form, to all members of the group. A second cycle then took place, which, in some cases, involved individuals commenting on others’ responses or revising their own contributions in light of what others had said. The process continued until there was a resolution, or consensus, or ranking, of the rationale for such a course, along with the recommended units and the overall structure and mode(s) of delivery.

The report and discussion of the Interviews is found in Chapter 6.

### 3.9 Limitations of the investigation

Having decided on a research procedure, it was recognised that there were some limitations in the design. First, the decision was made to limit the investigation to Reception to Year 7 government schools. As a result, a truly state-wide picture could not be obtained as these schools represented just over half of the total number of schools in South Australia. The remaining schools (which were not surveyed) were independent schools. This decision to limit the investigation to R-7 government schools was made on two grounds. The first was the opportunity to use the DECS distribution system for dispatch and return of the survey instrument. But secondly, and more importantly, it was from visits to schools and working with teachers from both the Independent and the DECS system that the researcher gained indications that the problem was more acute in the government school system than in the independent schools. The second limitation was in relation to the make-up of the
population for the questionnaire–survey. As it would have been impossible to include all teachers, the decision was made to include all Information Technology coordinators. These teachers, by virtue of their positions, would not only be most aware of the needs of their colleagues, but also would be more likely to be interested in the proposed Masters program. A more comprehensive sample could have been obtained by enclosing at least one extra copy of the questionnaire and asking the IT coordinators to give a copy to a colleague and invite them to participate.

The third possible limitation, also associated with the questionnaire–survey, could have been the almost inevitable limitation posed by the response rates. Robson (1996, p. 56) said that for investigations, which used the mail out questionnaire procedure, indicated that a response rate of only 10% could be a reasonable expectation. However in his case, the response rate was better than expected—135 from 476 i.e. nearly 30%—and so this proved to be less limiting than expected.

3.10 Concluding comments

These four methods of data collection were complementary. The literature review produced a background and a basis for the rest of the research because it revealed suggestions for conducting the other three stages of the research. It provided a series of questions for the interviews, provided models for designing and conducting the questionnaire-survey and the analysis of existing courses. These were the other strategies used to extend the inquiry and to verify the contentions and hypotheses underpinning the whole investigation.
Chapter 4

Literature review

4.1 Overview

In his review of the literature, the researcher adopted the advice from Wiersma (1986, p. 377) that the review should provide the background and context for the research problem being investigated and establish the need for the research in this area. In addition, Wiersma (1986) also stressed that the review should demonstrate the breadth and depth of the researcher’s knowledge about this area.

This review of the relevant literature sets out to identify key findings, and patterns or changes in the direction of research findings, with respect to the central focus of the investigation—namely, the professional development of teachers in classroom uses of information technology. It does this by considering the situation from the perspective of the past, the present and the future. The findings are organised into four sections, each of which discusses a major theme. It is further organised into sub-themes that have been identified from the ongoing review.

This review focuses on the last twenty years when computers have had such a growing impact on education. It endeavours to trace trends and changes, which have occurred in teacher professional development that have paralleled changes in classroom practice associated with the advent of more powerful hardware and more sophisticated software. These changes are examined in the context of the theoretical framework underpinning these changes.

4.2 Perspectives from the past

Chandler (1988) mooted the idea of a review of the literature as being a mapping exercise. To him, it was ‘a map of wrong turnings and blind alleys in the evolution of our ideas. It is like a journey where you are not sure where to start and you don’t know where you will end up’ (Chandler, p. 173). Walker (1997) suggested that researchers adopt an approach that shows: the path they have taken; the landscape
that has been covered; the wrong turnings; and the suggestions from their supervisors
and others who have been on the journey before.

When beginning a review of the literature in his chosen field, the researcher was also
working in the area. As a result, he had some idea of where to start but he didn’t
know where he would end up. An approach was therefore adopted that reflected the
views of Chandler and Walker.

This review followed a chronological pattern which focused on: (1) the pre 1990
period; (2) up to 1995; (3) 1995 to the present; and (4) future predictions and
possibilities. These periods also correspond closely to the evolving stages in
classroom practice. Heppell (1993) considered that there were four distinct stages,
which related directly to available technology and the courses in professional
development being offered. In the first stage (the early 1980s), Hepple used the term
“topicality” because computing was a topic or subject in its own right, which could
be taught and examined as such. The subject, Computer Studies, was a logical
development of this ‘computer as a topic’ approach. The focus was teaching about
computers and programming in BASIC and Logo.

Teachers at pre-service and in-service levels were exposed to Computer Awareness
units or short one-day workshops. The researcher, who experienced such
professional development in the early 1980s, recalls how ineffective and even
counter productive this approach was, partly because as Hepple (1993, p. 231) said,
‘the learner was seen as deficient’.

In the latter part of the 1980s, the shift was made to the use of the computer as a
surrogate teacher. The focus was on Computer-Assisted Instruction that assumed that
a computer-based learning environment was intrinsically motivating. In the area of
professional development, the focus was on using drill-and-practice software and the
first word-processing software using Apple11e, BBC or Commodore 64 computers.
This was achieved by provision of Computer Awareness units or one-day in-service
activities.

In the third stage, which was associated with advent of menu-driven Macintosh and
IBM 286 computers, there was a focus on the use of generic software tools from the
business world. In primary schools, in particular, the focus was on word-processing.
There were initial movements to encourage the use of computers across the
curriculum but activities were still largely teacher-directed, using integrated software like Microsoft Works. Professional development for teachers focused on: workshops that taught the use of these new tools—particularly spreadsheets and data-bases; computer-awareness units in pre-service training programs; and the advent of Graduate Diplomas in Educational Computing for practising teachers.

The fourth stage, which has as yet not been reached everywhere, revolves around Hepple’s idea that ‘pedagogic evolution requires us to be aware that computers not only bring something new to the learning environment but they change learners too’. (Hepple 1993, p. 223)

Now, in this twenty-first century, professional development for teachers, at both the pre-service and in-service levels, is concentrated on integrated classroom uses of information technology with a focus on using multimedia and accessing the World Wide Web. The researcher commenced with data from the early 1980s, when computers were first commonly used in education at the classroom level, and looked for patterns or changes in the directions of the research findings. Commenting on reports from studies carried out in the early 1980s, Olson (1990) concluded that ‘the richness of information provided by those studies obscured their descriptive nature. Recent critics of that research have questioned the generalisations resulting from those studies.’ (Olson, 1990, p. 22) The search concluded by focusing on studies, which related to the tertiary sector and in particular Masters level programs in Faculties of Education. In addition to a detailed ERIC search, the researcher obtained materials from; his overseas visits; conference attendance and participation at state, national and international level; and sabbatical leave taken in Canada, England and the United States of America.

The literature search centred on published journal articles that provided insight into the work of more experienced researchers. The researcher considered these to be a reliable resource because generally journal articles are required to meet certain rigid standards before publication. Conference proceedings tended to contain reports of activities, which had a focus on classroom activities rather than research. The contribution of these papers often depended on whether or not they were refereed, or if they were keynote papers. The area of theses and dissertations was also investigated because these covered similar research and provided ideas for the completion of this investigation.
4.2.1 Establishing the need

Wells and Anderson (1997), in their study on the attitudes of teachers as learners in the use of new forms of Information Technology, began with these observations which are at the core of this investigation:

The capacity of the computer to assist in the delivery of instruction is intrinsically limited by both by the software and hardware available on site and the willingness of teachers to learn to use these new tools. (Wells and Anderson 1997 p. 83)

There is no doubt the tools are already in our schools, but how is their use to be adopted and diffused so that there can be a meaningful integration of these new technologies? It is generally accepted that one essential element in the successful implementation of Information Technology into the classroom concerns the provision of appropriate training for teachers.

In 1991, the researcher visited nearly fifty schools, universities and training institutes in five different overseas countries. Most teachers and trainee teachers recognised the great value in using appropriate forms of Information Technology as an aid to the education process. The overwhelming majority, however, acknowledged that they did not have the expertise or confidence to do so effectively. This comment from a leading academic in Canada was a typical one: ‘It appears that the introduction of technology requires rethinking and retraining even for the teacher who is expert in instructional strategies.’ (Ragsdale 1991 p. 167)

A 1996 report by the National Board of Employment Education and Training voiced these same opinions:

   Education systems face an urgent task of having to raise the level of computer competency for a very large number of individuals in a very short time if adequate use is to be made of the new opportunities offered through access to national and global networks. (Tinkler, 1996 p. 123)

The purpose of this search was to establish if these perceptions were supported by systematic research and, if so, to determine what steps had been taken to redress the situation.
4.2.2 Professional updating of information technology-using teachers

Juliff, in his 1995 report from an International Federation for Information Processing Working Group, reached these conclusions, which support the need for this investigation:

Information technology in its many facets is one of the fastest changing areas of human endeavour. The half-life of most useful knowledge is measured in a handful of years. (Juliff 1995, p. 32)

There is an obvious need for teachers to upgrade their knowledge continually by means of professional development activities. Because the Department of Education and Children’s Services requires that all teachers in its schools in South Australia are to “IT Smart”, it may be useful to follow Juliff’s recommendation (1995, p 32) that teachers ‘pursue a continuing program of professional development and obtain an updated practising certificate’. There are well-documented accounts by Burgan (1988, 1989 and 1990), Wright, Dunn, Downes and Ridgeway and Passey (1994) of the patchy success achieved through pre-service training in classroom uses of information technology. Benzie (1995, p, 37) cites Robinson (1995) who argued that there would only be effective change if we gain a better understanding of the concepts and procedures associated with change. The situation with the training of in-service teachers is just as uncertain. Burgan (1992, 1995 and 1998), Joyce and Showers (1981) and Passey and Ridgeway (1994) have written about organising and running such activities. Benzie (1995) in speaking of the challenge to teacher education with serving teachers said:

A key difficulty seems to be in the design and delivery of in-service programmes, which are based on sound principles and so stand a reasonable chance of success. (Benzie 1995, p. 55)

Benzie considered that, unless this was done, the impact on classrooms would still leave a lot to be desired. He concluded by citing Baggott, Davis and Wright (1994) who produced a model showing how communications technologies themselves could support professional development for teachers by increasing access to specialist resources. Burgan (2001) described how, in South Australia, teachers have such on-line access through the Technology School of the Future in Adelaide.

The conclusions of a 1988 Special Committee Report on Educational Technology for the National Education Association provide a rationale and a direction for this
investigation. It recommends that teachers should be provided with regular in-service training in the use of technological applications for teaching and learning. There should be opportunities for collaboration and collegiality via electronic bulletin boards and nation-wide networks. Teachers need time and flexibility for professional development, research and planning. To help achieve this, they need to have regular access to a computer and appropriate software at school, along with access to a computer at home for training, planning and research purposes. The final conclusion, like that of Burgan (1998) almost a decade later, was that the planning focus should be on students’ needs, rather than the technology itself.

Faison (1996), while stressing the need for teachers to have appropriate technical skills, also concluded that teacher professional development programs ‘must provide consistent modelling of effective uses of technology in the classroom and the curriculum.’ (Faison, 1996, p. 23)

Before this can be done, the needs of the teachers have to be identified. Having identified these needs through the survey conducted as part of this investigation, the next step was to determine how these needs were to be met. Lupton (1996), in an article on facilitating the integration of Information Technology into primary school classrooms, concluded that leadership that addresses the challenges of information technology, had to be provided for curriculum implementation. The teachers, who complete the Masters level program, which is the end product of this investigation, should hopefully be in a position to offer this leadership and modelling role.

4.2.3 Possible approaches

As early as 1990, Bigum pointed out that concerns had been focused on the technology itself and not the application of it in education: ‘Teachers are keenly aware of the potential and are interested in acquiring the skills so they can effectively use new forms of IT.’ (Bigum1990, p. 447) This could only be achieved through appropriate professional development.

A detailed study by Marcinkiewicz (1993) investigated factors which can influence change in computer use and necessitate the need for appropriate training for teachers. His conclusions mirror those that this researcher found in his state-wide survey in 1998.
When an innovation, a device, method or behaviour, is introduced not all people will adopt the innovation for use even if it is specifically designed for their situation. (Marcinkiewicz 1993, p. 220)

He concluded that ‘most teachers will not adopt the use of computers even if computers are available and it is believed that they can improve the quality and quantity of teaching’. (Marcinkiewicz, p. 220)

Although Marcinkiewicz’s survey was relatively small (n=170) and covered only elementary schools, his finding that nearly half of the teachers surveyed were not using computers at all in their classrooms led to an investigation of the current situation in South Australia. The present researcher could not find any studies that provided such quantitative data, but anecdotal evidence and press releases, such as the following, indicated that there was a problem in South Australia, as well:

> Information Technology is an area of enormous implications, without which schools could no longer exist. The children know more than the teachers do and the gap is widening. (Kilvert 1996, p. 9)

Of Marcinkiewicz’s (1994, p. 234) three conclusions, two are relevant to this present investigation. His assertion that ‘the integration of computers into teaching may not be possible’ has proven to be misguided. But his conclusions that there has to be reconciliation between teachers and computers and that the training of teachers must be reconstructed in order to integrate computers into their teaching are at the centre of the need for this investigation.

Other views support the conclusions of Ridgeway and Passey (1994, p. 565) that ‘the potential will be rendered sterile unless teachers are empowered’. Snyder (1996b) asserted that ‘teachers needed development at a professional level to ensure effective and productive classroom uses of information technology’.

Collis (1993) put the case that teacher education had to respond if teachers were to be able to meet the challenge of more effective use of information technology in education. Her conclusions on how this could be best achieved are also at the heart of this investigation:

> There must be the opportunity for teachers to learn from their peers who are having profitable experiences with computer use. (Collis. p. 122)
Like Sherwood (1993) and Fonseca (1993), Collis concluded that the solution lay in on-going professional support rather than the “one-shot sort of blanket in-service sessions” espoused by the Minister for Education in South Australia. (Lucas 1997, p. 9) She concluded that quick change will not occur, but if and when it does, ‘it will only occur over considerable time, with patience and with various forms of ongoing professional support’. (Collis 1993, p. 122)

Veen (1993) reached similar conclusions. In particular, he cited the value of school based in-service training if Information Technology was to become a natural part of all classrooms. Like Collis, he had reservations about the pace and overall success of implementing such a change. Change is a slow process and it is unreasonable expectation that all teachers will accept innovation unless it is compatible with their existing skills and beliefs. The approach used must start from teachers’ existing practices and give them positive experiences, which will lead to new skills and, hopefully, a change in beliefs and practices.

Ridgeway and Passey concluded that this was an approach that could be used:

The importance of teachers observing other teachers and the development of peer and self-reflective strategies has been advocated since the mid-seventies. (Ridgeway & Passey, 1994, p. 564)

The model for this professional development has to be a situated, collegial and reflexive one if there is to be the desired outcome of better classroom uses of Information Technology. It is this model that was discussed in detail in Elective Research Study 2.

Another possible approach is to use Information Technology to help deliver professional development in educational uses of Information Technology. Slough and McGrew (1996) conducted a pilot study using the World Wide Web as a way to construct new professional knowledge and networks. Serim (1996) stressed the importance of the connection between teacher professional development in online environments and the contribution to life-long learning.

Soon after access to advanced networking becomes commonplace, learning will be liberated from locality and any one so motivated will be able to take responsibility for placing themselves at the centre of their own learning. (Serim 1996, p. 4)
Owston (1998), while recognising that such a delivery method is not always the most effective, argued strongly for such a model because, with it, teachers are in charge of their own professional development. He concluded that:

> Not only is the Internet a vehicle for professional learning and growth, but arguably it is the single most effective tool available today to help you improve professionally. (Owston, 1998, p. x)

The Adelaide-based Technology School of the Future has now adopted this approach in South Australia. The Technology School of the Future is integral to the $85 million state government’s DECStech 2001 Program—a five year state-wide initiative to develop IT in schools. The following is an outline of its structure and services.\(^5\)

1. It is the major centre for teacher development in learning technologies in SA, with eleven rooms set up with the latest equipment to address all areas of the curriculum
2. It provides opportunities for student groups with their teachers to trial and develop best practice in the use of learning technologies
3. It has a research role to investigate new developments in hardware, software and teaching techniques
4. It offers out-of-hours programs for students of all ages.

As well the Technology School of the Future has partnerships with a wide range of industry leaders in the use of technology in schools. These partnerships provide for co-operative development and promotion of the latest developments in the field.

### 4.2.4 Meeting the need

This section reviews of a selection of key reports and studies over the last decade from overseas countries and Australia relating to professional development in classroom uses of information technology. Even though there have been dramatic developments in the technology itself, however, in terms of approaches to training, there are universal ideas and theories that are longer lasting.

Anderson (1992) in his report of innovations at the River Oaks School in Canada examined the evolution of teachers’ views about technology resources and uses

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\(^5\) For more details its website is: www.tsof.edu.au/
during the first year of implementing an integrated curriculum supported by a range of new educational technologies. This critical finding from the study report matches this researcher’s view of the stages that teachers have to progress through:

The teachers’ picture of technology resources and applications shifted from the general to the specific, from knowledge to understanding and from technology development to technology applications and learning outcomes. (Anderson 1992, p. 4)

Over a ten-year span from 1985 to 1995, the Apple Classrooms of the Tomorrow (ACOT) project investigated how ‘best practice’ could be achieved after the introduction of computers. It concluded that ‘situated professional development is a powerful agent for change when teachers see other teachers and students successfully engaged in the routine use of technology’. (Dwyer, p. 16) The report found that the most effective approaches to help teachers use information technology were those that: built on teachers’ existing knowledge; involved small non-threatening group collaborations with opportunities to experiment and reflect on new experiences; and provided ongoing assistance and support to help implement change and innovation.

MacArthur (1996) conducted a study for the United States of America Department of Education on mentoring as an approach to technology education for teachers, which found that:

The Computer Mentor Program was a collaborative effort between a university and a school district, which developed and evaluated a model for staff development on the effective use of computers, based on successful mentoring models for beginning teachers. (MacArthur 1996, p. 46)

The conclusions from the study have specific application to this present investigation:

Traditional in-service education, time-limited and de-contextualised cannot offer the on-site support that inexperienced computer users need. This teacher mentor model has proven to be highly appropriate in this area because of its ability to address a wide range of needs and to support an extended process of teacher development. (MacArthur 1996, p. 46)

Strudler (1996) investigated the role of school-based technology co-ordinators as change agents in elementary school programs. He used a case study design that used questionnaires, interviews, observations and the review of relevant planning
documents to examine the work of three computer co-ordinators and the implementation of computers in their schools. The study found that co-ordinators still had a vital role because ‘educational change with technology is a moving target that requires ongoing co-ordination and support’. (Strudler 1996, p. 234)

The intention had been that co-ordinators would ‘work themselves out of their jobs’ in the same way that the researcher’s role at the Northern Territory University disappeared. Strudler’s conclusion has particular significance for the co-ordinators who are the subjects in the present investigation:

Effective co-ordinators help to obtain needed computer resources, provide training and follow up support, organise the “nuts and bolts” of the programs and collaboratively plan with teachers for technology integration. (Strudler 1996, p. 258)

As well as these roles, the co-ordinators, who were respondents in this current investigation, will be able to be ‘agents of change’ beyond their own schools. In the city they will be able to conduct workshops for co-ordinators and teachers from nearby schools. In the country they will be able to organise and conduct professional development activities on a regional basis.

4.3 Contemporary national and international perspectives

There are a number of national reports, which reach the same conclusion as Strudler (1996). Even though there are many interrelated factors that have to be considered to ensure the successful implementation of information and communication technologies in schools, effective teacher development is the vital one. The following reports from Canada, the United States and Australia all address this issue. They have been chosen because they give a national perspective of the situation in three countries and hence provide direction for the research conducted in this investigation.

4.3.1 Education and Technology Convergence Report

The National Board of Employment Education and Training in Australia commissioned this report in 1996. It was a national survey of technological infrastructure in education and the professional development and support of educators and trainers in information and communication technologies.
Education systems face the urgent task of having to raise the level of computer competency, integrated with educational practice, for a large number of individuals, many of whom are over 40 years of age. (Tinkler, 1996 p. xv)

The report methodology used involved a combination of surveys and interviews across all of the three education sectors nationally. There was communication and interviews with individuals who were identified as leaders in education and relevant technology fields. In addition there was a review of national and international literature and work in progress.

The following summary of the findings of the report is limited to the school sector because this is the prime focus of this present investigation.

- Professional development was the issue of concern to most respondents, second only in importance to funding.

- Leadership was a critical factor in the level of success achieved with innovative application of technologies to education.

- Resource people will be required to provide integrated technical and human support in all institutions where convergent technologies are used to deliver education.

The report concluded that these issues could only be addressed by providing appropriate training in the use of the convergent technologies:

This will require a professional development strategy that integrates individual initiative, system support and peer group training with innovative uses of the new technologies, including on-line services and open learning, as well as face to face programs (Tinkler, 1996 p. xv)

4.3.2 The Real Time: Computers, change and schooling

The Australian National Board of Employment Education and Training commissioned a second report in 1997. It was a national survey of 399 schools. Its prime focus was on the information and communication technologies skills of students, but it also considered the professional development and support needs of teachers.
Russell and Finger conducted the survey during 1998. There was a response rate of 55% to the questionnaire–survey so the study was able to provide a snapshot of the situation in Australia at that time. Needless to say, there have been dramatic changes since then. But the results mirrored those found by this researcher in his 1988 survey of all R-7 government sites in South Australia.

A considerable proportion of teachers (from 25% to more than 50%) is lacking some of the skills necessary to use or teach a range of computer applications (Real Time, 1998 p. xxix)

Of the teachers who responded to the survey, between a quarter and a half lacked some of the required basic computing skills. The report found that the teachers more likely to lack basic skills in the use of information technology would be primary school teachers, aged over 50.

The researchers found that teachers in government schools are falling behind in basic skills in comparison with teachers in independent schools. Their findings highlighted the need for computer skills to be recognised as an essential part of teacher education.

4.3.3 The CEO forum School Technology and Readiness (STaR) Report

Professional development: a link to better learning change and schooling

The quality of public education in this country increasingly depends upon our collective ability to close the gap between technology presence and its effective use in the pursuit of school improvement. (STaR Report, p. 3)

The CEO Forum on Education and Technology was founded in the United States of America in 1996. It was a unique four-year partnership between business and education leaders who were committed to assessing and monitoring progress toward integrating technology in American schools. The CEO Forum hoped to ensure that the nation’s students would achieve higher academic standards and would be equipped with the skills they need to be contributing citizens and productive workers in the 21st century.

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52 CEO refers to the fact that the business leaders were all Chief Executive Officers.
Since the CEO issued its first report, ‘The School Technology and Readiness Report: From Pillars to Progress,’ in October 1997, the number of America’s public K-12 schools effectively using technology has risen from 15 to 24 percent.

The summary of the conclusions from the report establishes clearly the link between teacher professional development schools and its impact on student performance. The report provides an overview of existing efforts to prepare teachers to be able to use technology to improve the teaching and learning environments in their classrooms. It describes the stages that teachers progress through as they do this. It gives a set of principles that underpin successful professional development activities. It concludes with a series of practical steps and recommendations and these comments which reflect the overall thesis of this investigation

We hope the report is helpful and that from it educators find support, inspiration, and some great ideas they can put to work in their schools. We also hope it prompts decisive action to empower teachers to take advantage of technology as a tool to improve education and student performance. (STaR Report, 1997, p. 3)

4.3.4 Integration of Information and Communication Technology through Teacher Professional Development: Issues and Trends in Canada

Increasing numbers of computers and a wide variety of information and communication technology (ICT) programs are entering Canadian schools and classrooms on a daily basis. This dramatic increase in the number of technology-based modes for developing and delivering educational programs requires increased emphasis on requisite teacher development. Teachers need professional development programs that can help them address the impact of technology in their classrooms, in their lives, and in the lives of their students. (APEC Report, 1999, p. iv)

This statement from the Executive Summary of the report reveals that educational authorities in Canada have reached the same conclusions as this researcher had assumed before he commenced this investigation. An outline of the project is given and then there is a brief summary of the key findings from the report and their significance for this study. This project was of particular interest to the researcher because in the early 1990s, when on sabbatical leave at the University of Calgary, he worked with teachers and students in all provinces in Canada. He found that not only were there many similarities in classroom uses of ICT, but because of the vast distances and remoteness, there were the same problems in providing professional
development for teachers. He was therefore very interested to discover what the situation was at the end of the decade and what approaches were being used.

This project was conducted under the leadership of the Council of Ministers of Education, Canada (CMEC) on behalf of the APEC Education Forum (EdFor). This report, which was prepared by Judy Roberts & Associates/ Associés Inc. (RAA), constituted Canada’s contribution to the first part of the process; i.e., a summary report on issues and trends in pre-service and in-service teacher development.

The methodology consisted of the following steps. A survey was conducted of relevant published and unpublished literature since 1990. Key persons in the K-12 education sector were interviewed by telephone and asked to provide information in a brief interview. Results of the interviews and the literature search were analysed and synthesised. Comments from Departments of Education across Canada on the draft report were integrated into the final document.

The results section of the final report identified key issues and trends and began to identify objectives and critical success factors in teacher development. The prime issue was the need for teachers to be able to use ICT effectively in own classrooms:

> Teachers need to understand the relevance of using technology. In one sense, this is just another tool. In another sense, it requires a paradigm shift in how they do their work. That technology may be changing the role of the teacher is a frightening prospect for a lot of teachers. According to one interviewee, for some teachers, a basic fear of incompetence in taking on something new inhibits adoption of ICT in their classroom practice. (APEC Report, 1999, p. 7)

It was suggested that this issue was compounded by the lack of teacher qualification and certification.

Related to this issue was the concern that too many teachers did not appreciate the benefits to learners in using ICT. Because of the failure of other technologies in the past, it is often difficult to convince teachers of the value of current ones:

> There is lack of consensus about the benefits of learning technologies in schools. There needs to be more research about how to use them effectively. An issue for teachers is whether technology is a tool or the force for change. There is an apparent need for a debate about the very nature of our educational system i.e. just what the new educational system should be and how learning technologies can benefit teaching and learning. (APEC Report, 1999, p. 7)
A third issue related to funding for equitable access to equipment and local technical support services. The final issue relevant to this study, related to the timing and relevance of teacher development:

Lack of time for professional development and for developing and integrating learning technologies in the classroom is a fundamental problem. Professional development is often “top-down” with no assessment of needs about where teachers are in their knowledge and skill levels. A key issue in designing teacher development programs is to make learning relevant for teachers. (APEC Report, 1999, p. 9)

This section of the report ended with some suggestions for sustained and sustainable teacher development. It was critical, like this researcher, of the “one-shot, product orientated” models. Professional development activities should be less of an event and become more of an ongoing program. When teachers go back to their own schools they have to have access to the same ICT they have used at the training session. Of course this traditional “face-to-face” model is not the only model. In some situations, as in remote areas in South Australia, it is no longer affordable or the most effective model. This report recommended an approach that included some face-to-face contact, but ‘also has a longer-term continuous learning process and contains built-in opportunities for interactive practice and reflection.’ (APEC Report, 1999, p. 10)

Any model has to take into account varying teacher needs. Not only are teachers at very different levels in their knowledge and skills in ICT, they are at different stages in their careers. The average age of teachers in South Australia is approaching fifty. With so many soon to leave the workforce, there is little incentive for them to become expert in the use of ICT. The problem is that many professional development programs in the past have ignored these facts and treated teachers as if they were at the same levels and with the same learning styles.

**Issues identified**

The conclusions from this Canadian report, with reference to its search of the literature for models for professional development, are very similar to the perceptions that researcher had at the start of his investigation into the situation in South Australia.

The whole model of teacher development needs to change and be driven by the results required. ‘Model the behaviour you are trying to teach’ is
the mantra for best practice: e.g. adopt a mentor-based delivery method if
the aim is to encourage teachers to coach and mentor when using ICT.
The mentors must have credibility and the presentation model must show
respect for the teachers. (APEC Report, 1999, p. 18)

There were ten issues identified. Only those that relate to continuing professional
development for practising teachers are discussed here.

Time was the key issue raised in the literature. ‘Teachers lack time in the school
schedule to learn how to use the technology, experiment with it, integrate it into
effective lesson plans, and learn how to apply it to classroom project’. (APEC
Report, p. 10). Honey and Hendriquez (1994), Lane and Cassidy (1994), and
Laferriere (1998) also expressed this view. Bryson and De Castell (1998) in their
study of technology implementation in primary schooling reached the same
conclusion but added a note about the disparity between the expected allocation of
time from the point of view of teachers and those advocating the adoption of ICT.

The literature emphasised that teachers have to be convinced that integrated ICT
does make a difference in teaching and learning. Moll (1997, p. 8) found, like
Burgan (1992), that a critical factor was the “mindset” of the teachers. They have to
appreciate that the effects will both positive and negative.

The next set of issues related to professional development activities. Fulton (1997, p.
76) suggested that ‘teachers learn best, and are most likely to embrace new
approaches, when they can experiment and reflect in a safe setting, and have
opportunities to discuss ideas and collaborate with their peers and instructors as they
put new ideas into practice.’ Sherry and Morse (1995) provided an extensive list of
strategies that could be used to meet the needs and gaps in teachers’ ICT skills and
knowledge. It is necessary to provide an organised, ongoing, varied program, which
meets the needs of teachers at the level they are at and the stage of their careers.
These comments by Fulton (1997) sum up the situation aptly:

We should ensure these key elements of professional development are
supported. These include time to experiment; practice that promotes
confidence that they are in control of the technology, and not vice-versa;
opportunities for reflection; and occasions for collaboration with
colleagues. In a word, teachers need support all the way; support that
goes far beyond the in-service workshop quickfix. (Fulton, 1997 p. 76)
In all situations an essential element is the provision of access of ICT of sufficient quantity and quality. But of course, as Laferriere (1998) and Burgan (2001), have pointed out, the mere provision of equipment does not necessarily mean it will be used effectively in the classroom. This will only happen if teachers receive appropriate and ongoing help and support. Laferriere (1998) commented that, over the past ten years, North American educational research journals and other publications have stressed ‘the relevance of creating communities and cultures of professional teachers.’ (p. 3). Without this support Lynch and Ekelund (1999. p 3) concluded that only those who are comfortable with technology persevere. We need to be able to support and nurture those individuals who are just beginning to see the promise of technology.’

Trends identified from interviews

In the telephone interviews responses to the issues identified by the report were discussed. From these a series of trends and professional development objectives were identified. Both of these areas are closely related to the focus of this study, What follows is a brief summary of the specific findings which are most pertinent to it.

Interviewees indicated that there was a distinct trend towards using ICT to provide professional development and in-service opportunities for teachers. Among strategies listed were several, which this researcher discusses in more detail in Elective Research Study 3. The Technology School of the Future in Adelaide in South Australia has set up a Web site, a series of listservs and discussion or conference sites, as well as studio and video conferencing. It has plans to model the Canadian system by providing interactive television and streamed video-on-demand.

The advantage of using a self-directed teacher professional development model is that it allows teachers to use an action research approach to test what they have learnt in their own classrooms

Another trend is the provision of self-directed professional development programs that offer both credit and non-credit training opportunities over longer periods of time than the traditional workshop or conference approaches. (APEC Report, 1999, p. 17)

It moves away from the “visiting guru” model to more of a mentoring one where they are working with colleagues who are successfully using ICT. There are more
practical applications that link ICT to the curriculum. A program like this, run as joint one between Simon Frazer University and the Open School in British Columbia, illustrates such a self-directed model, which could well be adopted here.

The Teaching and Learning in an Information Technology Environment (TLITE) program starts with teachers identifying gaps in their competence with technology. With mentor support they design a learning plan to address the skills and knowledge they wish to acquire. Then, they embark on a two-year program that combines face-to-face training and mentoring experiences with asynchronous access to a web-based learning management system. (APEC Report, 1999, p. 16)

The prime objective is to provide teachers with skills and knowledge to be able to integrate ICT into the curriculum and hence help students learn more effectively. To achieve this teachers have to a clear appreciation of why and when and where to use ICT.

4.4 Bringing about change

4.4.1 Integration as a major innovation

Lucas (1998, p. 9), said that in South Australia in the last decade, computers had become a significant resource in the classroom. He also predicted that the ratio of students per computer would fall from the present figure of 1: 20 to 1: 5 by the turn of the century. This target was achieved (reached (Richardson, K. 2000, pers. comm., 2 March). With an increase in the number of computers in schools, David (1991) identified an accompanying problem: ‘what is the solution to the most pressing dilemma facing educational reform: how to spread the accomplished practice from a few teachers to many?’ (David 1991, p. 3)

In the middle 1990s, when the researcher visited primary schools, a typical computer room scenario was as follows. A group of children copied their compositions onto the computer with the help of a computing teacher or clerical aide. At the end of the lesson, the teacher saved the files and printed them out after school for distribution the following day. The scenario is very different today. Students type their work straight onto computers or use voice recognition software, use the Internet for research, desktop publish their work, and produce newsletters and advertisements. They are also creating their own web-sites, or helping to create the school’s web-site.
The researcher agrees with Fullan (1992, p. 20), that schools must be reconstructed — a prerequisite to accommodate any significant innovation. Information Technology has been the catalyst for a transition from blackboards and textbooks to a method of instruction where students can explore, discover and construct their own knowledge. Many teachers have had to change their role to that of mentor or facilitator, and re-think how they provide opportunities for students to learn. The shift in paradigm has been from instruction to knowledge construction.

It is just as vital that professional development assists and supports teachers in their shifting roles, as it is for teachers to accept the changes. These inevitable shifts, brought about by the impact of Information Technology, are changing the way in which teachers approach learning and teaching: from curriculum centred to learner centred; from individual tasks to collaborative work; and from passive learning to active learning.

Dudley and Dudley (1990, p. 271) defined integration in relation to the use of computers in the classroom as ‘the process of applying the power and ability of the computer to learning in every subject area’. In its introduction, the International Federation for Information Processing WG.3.1 Report (1992, p. 6) said that:

> It is not realistic to expect all teachers to be up to date, enthusiastic or confident in applying IT in their work. Some will fear IT and will need help in building confidence and making the most of the potential of IT in an environment where students tend to be more IT proficient than their teachers.

The International Federation for Information Processing report concluded that ‘peer to peer support and support from experienced teachers, in informal and friendly sessions, increases the confidence of teachers and might be the most effective teacher training mode’ (IFIP WG.3.1, p. 20).

Because the focus of this investigation is to provide teachers with support for the improvement of their classroom uses of IT, then the following research questions had to be considered and answered:

- Is it true that many teachers are not able to use IT effectively?
- If so, what are their needs and what are the best professional development strategies to meet these needs?
• Are there teachers who are resisting change because they feel IT will not enhance the teaching and learning environment in their classrooms?

• What are effective IT using teachers able to do with Information Technology that others can’t?

• How have these teachers acquired these skills? What professional development have they had?

• Are there any variables such as age, gender, years of experience, training, that apply?

• What are different approaches that will produce positive changes?

• What are the types of professional development, both technological and pedagogical, which will provide these teachers with the skills and knowledge to apply IT effectively in their own classrooms?

• Who will provide this training now that state-wide programs no longer exist?

• Will it be teachers like the graduates of the MEd course, the framework for which, is the end product of this investigation? They will have the skills and expertise to provide the leadership, professional development and ongoing support at the school level.

The researcher began seeking answers by considering how change had occurred in instances, situations and schools that he knew about personally. In Australia, the IBM project in the middle 1980s involved the spending of considerable time and effort on exemplar classroom non-computing teachers. These teachers became role models and agents of change for the use of Information Technology across the curriculum. This was an early example of the “cascade” model of professional development. Apple later in 1985 used the same strategy with the concept of the mentor being the agent of change through peer collaboration. After ten years, they released a report of their Apple Classrooms of Tomorrow (ACOT) project.

The findings of the ACOT study gave a clear theoretical basis for bringing about change using the concept of coaching or modelling. This model stressed the
importance of teachers observing other teachers and the development of peer and self-reflective strategies.

Joyce and Showers (1988, p. 72) wrote: ‘coaching, a process in which teachers can interact with others to practice new and experimental techniques without fear of evaluation, is a method that is often implemented to accomplish effective change’. Although they were not specifically talking about classroom uses of Information Technology, this is the approach, which would be used by the graduates of the program envisaged as the end product of this study.

4.4.2 How do teachers change their approach to classroom uses of Information Technology?

A great deal of recent research, both in Australia and overseas, has shed light on the nature of educational change, the impact on teachers of change, and effective ways to bring about change in schools. (Murdoch, 1996, p. 101)

There are certain principles underlying professional development, particularly with reference to Information Technology. As a result of the findings of studies by researchers like Joyce and Showers (1981) and Guskey (1985), the role of the outsider as the agent of change has been challenged. This researcher was involved in such a role in the country professional development described in Part B. While teachers who participated appreciated the efforts, they indicated in their evaluation forms that they felt that there were local teachers who could have been used in the role. They felt that these in-service programs, with minimal teacher participation or follow-up, should be replaced by situated on-going models. Campbell (1991) expressed the view, that change is a very personal process. If teachers are to cope with the demands of implementing Information Technology successfully, this change needs to be associated with the opportunity for reflection and the enhancement of self-esteem.

4.4.3 Models of professional development in classroom uses of ICT

The One Day In-service Model

This approach was used widely in the early and middle 1980s, in response to an urgent need to provide teachers with basic training. Education Departments were able to say they had conducted huge numbers of these courses, for vast numbers of
teachers (Sandery, 1986). As a participant at a number of these courses it now seems obvious why they didn’t succeed (Burgan, 1988).

In the researcher’s experience the courses were delivered by consultants, who had a Computer Science background (Burgan, 1990). The focus was on very basic computing skills and programming in BASIC or Logo (Lewis, 1990). There was little attention paid to classroom uses or software evaluation. Teachers were often treated as children and bamboozled with technical jargon. Many came away frustrated, humiliated and convinced that they did not want to use computers in their classrooms.

Courses provided for teachers by Faculties of Education

This reference from the researcher’s paper presented in Paris in 1992 shows an example of how Faculties of Education responded in the late 1980s to the needs of teachers by providing a range of programs starting from the undergraduate level.

The first courses, a compulsory unit — Computer Awareness — and an elective unit — Computers and Society — were offered in 1985. By 1991 we offered 2 units in the DipEd, up to 6 units in the BEd, a Graduate Diploma and a specialist strand of 3 units in the MEd. (Burgan 1992, p. 1305)

These courses gave pre-service and in-service teachers the skills and techniques which they were able to use to help them harness the power and potential of what were then the new technologies such as Laser Discs.

The search for literature in this area began by identifying reports or studies of past and existing Masters level programs and evaluating them to see how they could contribute to the proposed program in this study. Collis and Muir (1985) conducted a survey of computer education courses offered by Faculties of Education in Canada. It revealed that only 5 of the 49 Higher Education Institutions offered Masters level programs which were designed to help teachers in the application of computer technology to teaching and learning. The report of this survey provided invaluable information for the researcher with respect to his own survey of institutions in Australia today. It provided a structure for the survey of existing courses and gave suggestions for strategies, which could be used.

Ekhaml’s (1985 and 1989) studies of universities in the United States of America offering Graduate Degree Programs in Computers in Education were similar to that
by Collis and Muir (1985). Ekholm found in her surveys an increase from 41 institutions in 1985 to 82 in 1989. Her studies also provided ideas for the researcher in the conduct of his survey of current programs offered in Australia. In 1988, Freyd and Kahn from the Graduate School of Education at the University of Pennsylvania produced a detailed review of the history and results of the six years of operation of their Masters Degree program in Computer Education.

The aims of the program were very similar to the one proposed as the end-product in this investigation.

The Masters program fosters important research in educational technology. Teachers with training in computer technology are urgently needed. Educational leadership will come from teachers who are able to explore the possibilities of integrating computers into the curriculum. This graduate program began as an effort to help interested teachers become those leaders and the courses offered serve students aspiring to become specialists in the field. (Freyd 1988, p. 69)

The stated aims of the program (Freyd, 1988, p. 71) were: to contribute to the development of computers in education; to enable teachers who take the courses to help integrate computers into the curriculum; and to develop a research agenda concerning the use of computers in education. The researcher has incorporated these aims into the design of his questionnaire-survey and the framework for the MEd course which is envisaged as the end-product of this investigation.

Willis (1991), in an article, which was a later version of a 1990 conference paper, outlined the need for graduate training for the next generation of leaders in educational computing. Willis reported that in the United States of America, as in Australia in the 1980s, there was a dramatic increase in the number of institutions offering graduate programs in educational computing. There, they were classed as Masters level, while in Australia, they were at the Graduate Diploma level. By 1990, Willis (1991, p. 333) stated that in the United States of America ‘there are probably more than 150 educational computing degree programs today’.

He then went on to consider whether these programs were meeting the needs of their students. Like this researcher, he felt that such programs should be ‘preparing students for leadership careers that involve special responsibilities in the area of educational computing’ (Willis, p. 334). He concluded his introduction by citing
from a publication from the North Carolina State Department of Public Instruction Programs:

Educators through advanced study and preparation, wish to develop extensive knowledge and skill in a broad area of computer technology and its application to the K-12 curriculum. The role of the computer specialist may vary from one educational leader who co-ordinates the overall computer technology program in a school or to one, who concentrates in a specific content area or specific process. (Computer Competencies in Public Schools. p. 9)

After his review of proceedings of international conferences in computer education, the researcher carried out a search of the CD-ROM based proceedings of the international conferences held by the Society for Information Technology and Teacher Education from 1995-7. In the category, Graduate and In-service Education, a paper was located which discussed the development and implementation of a Masters in Education program in Classroom Technology at the Bowling Green State University in Ohio. The content was so close to his own field and approach that a personal email contact was made with the co-ordinator of the program. Full details of the paper and the ongoing electronic communication are located in Chapter 9, Program Framework.

In recent years there have been state and national movements towards the establishment of key competencies for teachers. In South Australia all teachers are expected to be competent information and communication technologies users. This section considers various key reports of strategies designed to achieve this.

Dewert (1996) advanced the idea of a partnership between schools and universities. The collaborative nature of Dewert’s proposal may be likened to the proposal that the University of South Australia and Deakin University could be involved in the delivery of the Masters program, the framework for which is the end product of this present investigation.

The IFIP Professional Group 5.2 in its report from deliberations at WCCE 2001 also recommended this collaborative strategy. It felt that universities now had the equipment and the expertise to be able to work with professional groups, such as the Computers in Education Group of South Australia, to jointly provide continuing professional development courses, which could then be accredited towards a formal qualification.
4.5 Concluding comments

This primary aim of this current investigation was to establish if DECS R-7 teachers in South Australia, have the skills and expertise to cope with the inevitable impact of ICT on the teaching and learning environment in schools. This literature review was the first of the four research strategies, which were used to achieve this aim.

The purpose of this literature review was to provide a background to the research, to answer many of the research questions that emanated from the primary aim and to give assistance in the design and implementation of the data collection instruments used in the other three research strategies used in this investigation.

This chapter has provided a chronological overview of professional development strategies used over the past decade to assist teachers to make more effective use of what were referred as computers and related technologies and now as information and communication technology. This approach was adopted to show trends, changes and patterns.

It therefore served to provide a background and a setting for the overall study and provided a basis for the rest of the research because it revealed suggestions for conducting the other three stages of the research. It identified a series of questions for the interviews and provided models for designing and conducting the questionnaire-survey and the analysis of existing courses.

The review confirmed the contentions the researcher had formed from working for more than a decade in the field of investigation and from the initial review of the literature for the Proposal in the early stages of his doctoral study. He contended that there had been dramatic changes in hardware and software and approaches to the use of IT in the classroom. Many teachers felt they had not kept up to date and needed assistance. Existing models of professional development appeared to be not as effective as they should have been, mainly because they ignored the principles, which apply to the adult learner. Although the study was set in South Australia from his wide experience the researcher felt these problems were not unique. Apart from the findings from one very limited investigation (Norman, 1997), there appeared to be no documented evidence of the need for professional development. As well, there seemed to be a lack of material relating to Masters level courses.
Much of the evidence, which was found in the literature search, was included in Part A and Chapters 1–3, which dealt with the identification of the problem and the research methodology. The current reports cited showed that there was still an urgent need for continuing professional development and that strategies used need to be more effective than many models used in the past. The implications from the findings of this review of the literature were that the researcher had to establish what were the need of teachers in South Australia, hence the questionnaire-survey strategy detailed in Chapter 5. He had to establish what leading educational figures and researchers felt about the professional development needs of teachers, hence the interview strategies detailed in Chapter 6. Finally he had to identify what were the current offerings in MEd courses in Australia, hence the survey of existing courses detailed in Chapter 7.
Chapter 5

Presentation and discussion of findings from the questionnaire-survey

5.1 Overview

This chapter outlines and discusses the findings from the state-wide survey carried out in South Australia in March 1998 using a survey-questionnaire (see Appendix C). The chapter begins with a brief comment on the return rate of the survey. It then outlines how the data collected were organised and then analysed. Then there is the analysis of results, in accordance with the design of the survey instrument (see Chapter 3.6). It is divided into three parts plus a section for cross tabulations. The chapter ends with a concluding discussion.

5.2 Return rate

The number of questionnaires sent out was 467. Of these, 135 (68 from the city and 67 from the country) were returned completed, giving a return rate of nearly 30%. In addition five were returned uncompleted with a comment on them that the recipient did not wish to participate any further.

![Return response chart]

Figure 5: Response to survey

5.3 Presentation of the results of the data collection

Where possible the results of the survey have been coded (see Appendix D). The information drawn from the coded responses is presented in a series of computer
generated frequency tables and graphs. These enabled a more efficient and faster means of analysing the responses. Those questions that could not be coded, because they elicited open ended rather than fixed responses, have been summarised. The cross tabulation tables illustrate possible relationships between one question and another.

The response matrix (see Appendix D) is in the form of a spreadsheet comprising 23 columns, each of which is headed by the question number, and 135 rows, each of which is designated by the respondent's assigned number. The matrix contains the coded responses to the questions.

5.4 Analysis of results

The analysis and discussion of the results is divided into sections corresponding to Parts A, B and C of the questionnaire and then there is a section where there are a series of cross tabulations. The first, that contained ten questions, was designed to collect demographic information and to establish if there was a need for professional development in information technology. The second was designed to collect data about the specific areas in which teachers need professional development. The final section enabled respondents to make any comments or suggestions. The final section containing the cross tabulation tables illustrated possible relationships between one question and another. Each section started with a brief introduction. For each question there was a statement of the question, a response and a comment.

5.4.1 Results from Section A: Demographic details

This first section, which contained nine questions, was designed to collect demographic information and to establish if there was a need for professional development in information technology at the workshop level as well as the level of interest in a coursework MEd course. Teachers were not asked to give details of their age or gender because this information was not considered relevant to the study.

Results of the analysis of the responses are shown on the following pages. There are tables and figures for each question as well as 'Comments' and 'Discussion. For ease of interpretation the discussion of the responses to each question starts on a new page.
Question 1a

Are you country or city based?

Responses

Table 1: Frequency table for Q1a

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>68</td>
</tr>
<tr>
<td>Country</td>
<td>67</td>
</tr>
</tbody>
</table>

Figure 6: Frequency graph for Q 1a

Comments

It appeared from a number of responses to this question that there was some confusion over whether some schools were located in the city or the country. When DECS was contacted, the situation became even more confusing because there appeared to be three different ways in which schools were classified. Some schools, which were closer to Adelaide than others, were classed as country because of boundaries drawn up last century.

The decision was made to classify schools as being in the city if they were within a 50-kilometre radius from the centre of Adelaide. Within this zone, teachers would be able to participate in professional development activities conducted after school in the metropolitan area or attend lectures. As a result there was one less school classified as country and one more school classified as city.

Discussion

The fact that the number of responses from the country (n=67) was very close to the number from the city (n=68) was unexpected given that there were almost 50% more city schools (n=274) compared with the country schools (n=193). The response rate from the city was 25% compared with almost 35% from the country. The higher percentage return for country regions was even more unexpected given the fact that the DECS Distribution Centre requested that the survey instrument be returned on a due date which occurred before some country schools had even received the instrument.
This higher proportional response from the country could indicate that Information Technology co-ordinators in the country are more concerned with the need for professional development for their colleagues than teachers in the city. The results of the analysis of the open-ended responses to Q 12 and the cross tabulation between Q 1b and Q 9 supported this view. This cross tabulation compared the ratings of teachers as information technology users and in particular compared the numbers of teachers in the country and the city who were rated as being below average as users of information technology.

As well, only 12% of country respondents compared with 16% for the city indicated that they had a formal qualification. If this lack of qualifications was reflected in an interest in pursuing further qualifications, this could be another explanation for the higher response rate to the survey from the country.

The analysis of the cross tabulation of responses to Q 5 ‘Would you consider undertaking Coursework Masters degree’ and Q 1a ‘Are you city or country based?’ showed that almost an equal percentage of country and city respondents were interested.
Question 1b

If you are city based which region are you in?

Responses

Table 2: Frequency table for Q1b

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>15</td>
</tr>
<tr>
<td>North</td>
<td>22</td>
</tr>
<tr>
<td>South</td>
<td>11</td>
</tr>
<tr>
<td>East</td>
<td>12</td>
</tr>
<tr>
<td>West</td>
<td>8</td>
</tr>
</tbody>
</table>

Figure 7: Frequency Graph for Q1b

Comments

The higher responses from the North and Central regions were expected because the majority of schools were in these two regions. It would have been useful to be able to analyse the returns on a percentage basis, region by region, as was done in Q1a. This should have been done so that a comparative analysis could have been conducted which would have revealed if there were significant variations in the response rates which warranted further investigation.

Discussion

From his involvement in professional development activities with the Computers in Education Group of South Australia (CEGSA), the researcher was aware that teachers in schools closer to the city had more access to training sessions. The same level of opportunities was not provided for teachers in the rapidly expanding area to north of the city. Hence the level of response from IT co-ordinators was not unexpected. The most unexpected finding was the low response from the West region. This could possibly be explained by the fact that the Technology School of the Future is in this region and hence teachers have easy access to its training facilities and hence did not feel a need to respond to this survey.
Question 1c

If you are country based which region are you in?

Responses

Table 3: Frequency table for Q 1c

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East</td>
<td>16</td>
</tr>
<tr>
<td>Riverland</td>
<td>12</td>
</tr>
<tr>
<td>West Coast</td>
<td>7</td>
</tr>
<tr>
<td>Mid North</td>
<td>13</td>
</tr>
<tr>
<td>Southern</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
</tr>
</tbody>
</table>

Figure 8: Frequency graph for Q1c

Comments

Approximately the same number of survey instruments was sent to all regions. The highest number of responses came from the Mid North which also included Yorke Peninsula. This region had the greatest number of schools. The lowest response was from the Southern region.

Discussion

The fact that the return rate from the country (35%) was higher than the city rate (25%) could be due to one of two factors. The researcher was well known in the country from his state-wide professional development activities and conference involvement. Also, country teachers might have felt a greater need for assistance and were, therefore, more inclined to participate in this part of the study. The low return rate from the Southern region was possibly due to the fact that these schools are the closest to Adelaide and teachers could access professional development activities there. As well, the researcher knew that were several well-established hub-groups which were providing this assistance.

The high return rate from the South East and Other regions (this would include the more remote schools in the far north of South Australia) was not unusual because these regions were the furthest from Adelaide and so teachers’ opportunities for assistance were limited.
Question 2

How many teachers are there in your school?

Responses

Table 4: Frequency table for Q2

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>1</td>
</tr>
<tr>
<td>1-10</td>
<td>47</td>
</tr>
<tr>
<td>11-20</td>
<td>55</td>
</tr>
<tr>
<td>21-30</td>
<td>20</td>
</tr>
<tr>
<td>31-40</td>
<td>5</td>
</tr>
<tr>
<td>41-50</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 9: Frequency Graph for Q2

Comments

The data collected from the analysis of the responses to this question was used to estimate the total number of teachers involved in the survey. This figure was used to calculate state-wide ratings of teachers as ICT users.

Discussion

More than 75% of the schools, which responded, had less than 20 teachers. This probably was because the only small schools are in the country regions. It was also perhaps due to the fact that respondents from these schools felt their teachers needed more outside help than they were getting.

It would have been interesting to investigate if there was any significant relationship between the number of teachers in a school and the level of their ICT skills. As well it would have been useful to see if ICT co-ordinators in larger schools were more likely to have formal qualifications or the title ‘ICT co-ordinator’.
Question 3

Do you hold a position as an IT Co-ordinator?

Responses

Table 5: Frequency graph for Q3

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>2</td>
</tr>
<tr>
<td>Yes</td>
<td>78</td>
</tr>
<tr>
<td>No</td>
<td>55</td>
</tr>
</tbody>
</table>

Figure 10: Frequency graph for Q3

Comments

The responses to this question revealed that only just over half the respondents actually had the title of ‘co-ordinator’. It would have been worthwhile to conduct a cross tabulation analysis, which compared the results from Q.2, the number of teachers and this question. This would have shown if the more teachers there were the greater was the probability of the respondent having a formal title.

Discussion

The implication of this finding meant that IT co-ordinators had the responsibility without the authority, which a title perhaps could have given them. Kershaw and Webber (1990) concluded that unless co-ordinators had this authority it was very difficult for them to bring about desired changes in their schools.

It was interesting that all of the respondents who had a formal qualification, did have the title of IT Co-ordinator. This could explain why so many respondents expressed such a positive interest in undertaking a MEd.
Question 4a

Do you have any academic qualifications in educational computing?

Responses

Table 6: Frequency table for Q 4a

<table>
<thead>
<tr>
<th>Qualifications</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
</tr>
<tr>
<td>No</td>
<td>113</td>
</tr>
</tbody>
</table>

Figure 11: Frequency graph for Q4a

Comments

In recording the responses to this question, only formal qualifications such as a Graduate Diploma or Certificate or a major in a BEd were entered.

Discussion

Nearly 15% of respondents said they had a formal qualification. When their actual qualifications were examined, many of them related to non-award courses. The results shown here indicate that less than 10% of respondents did have a formal qualification, such as a Graduate Diploma or a major in a BEd.

Given the popularity of the Graduate Diploma in South Australia in the 1990s, this figure was surprisingly low. It would indicate that many of these ICT co-ordinators had gained their expertise from their own efforts rather than from formal academic programs.
Question 4b

What qualification do you have?

Responses

Table 7: Frequency table for Q 4b

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grad Cert</td>
<td>1</td>
</tr>
<tr>
<td>Graduate Dip</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure 12: Frequency Graph for Q4b

Comments

Even though 21 respondents stated they had an academic qualification in fact only seven had a formal qualification. Five had a major or minor strand in a BEd or DipT. The rest of the “qualifications” referred to either workshops or short courses.

Discussion

By far the most common qualification was a Graduate Diploma in Educational Computing (n=7) from the University of South Australia, but this program is no longer offered. The other respondents cited a major in a BEd or DipT (n=5) and a Graduate Certificate in Educational Computing (n=1).

Results from the city (n=7) and the country (n=6) revealed that qualifications were evenly distributed. This was not expected given the much greater number of schools in the city.

Given the fact that the Graduate Diploma in Educational Computing from the University of South Australia had been available for more than a decade, it would appear unusual that so few respondents had such a qualification. From his state-wide P.D. activities, the researcher identified that many of these graduates were in fact now teaching in non DECS schools.
Part C — Dissertation

Chapter 5 — Results of survey

**Question 5**

Would you consider undertaking a coursework Masters level program in classroom uses of IT?

**Responses**

*Table 8: Frequency table for Q 5*

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>15</td>
</tr>
<tr>
<td>Not at all</td>
<td>13</td>
</tr>
<tr>
<td>Possibly</td>
<td>98</td>
</tr>
<tr>
<td>Definitely</td>
<td>9</td>
</tr>
</tbody>
</table>

*Figure 13: Frequency Graph for Q5*

**Comments**

Because one of the focal points of this whole investigation was to determine the level of interest in a coursework Masters program, the responses to this question were of vital interest. The responses to this question were very different to any other. There were more ‘No responses’ than for any other question and nearly 10% selected ‘Not at all response’. The vast majority of responses were either ‘Possibly or ‘Definitely’.

**Discussion**

A possible reason for the high response rate in the first two categories was indicated in the analysis of the open-ended responses to Question 9. There was widespread criticism of past and current university courses and the cost element. This of course has implications for the model program, which is to be the end product of this whole study. Of greater significance was the high level of interest in such a program. More than 80% of respondents said they were possibly interested and nearly 10% of them were definitely interested. This included four respondents, who already held a Graduate Diploma.
Question 6

If you would consider undertaking a coursework Masters level program in classroom uses of IT, what mode of delivery would appeal to you most?

Responses

Table 9: Frequency table for Q 6

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Response</td>
<td>12</td>
</tr>
<tr>
<td>On Campus</td>
<td>13</td>
</tr>
<tr>
<td>Summer School</td>
<td>17</td>
</tr>
<tr>
<td>Off Campus</td>
<td>30</td>
</tr>
<tr>
<td>Electronically</td>
<td>63</td>
</tr>
</tbody>
</table>

Figure 14: Frequency Graph for Q6

Comments

The response to the last category was so high that the researcher doubled checked the figures. The response rates for the other categories were much much lower.

Discussion

Most of the ‘No responses’ came as expected from respondents who had indicated they were not interested. The results from this question have direct implications for any existing or proposed program. Teachers are obviously not interested in the traditional on-campus delivery mode. Even the majority of city respondents, who expressed an interest in the program, preferred the electronic delivery mode.

When the researcher contacted the respondents who had said they were definitely interested and by using a variation of the Delphi interview technique, obtained a consensus that they preferred a program which was delivered electronically but with an on-campus Summer School component.
Question 7

How would you rate the proposed units?

Response

Table 10: Frequency table for Q7

<table>
<thead>
<tr>
<th>Resource Management</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT and Society</td>
<td>17</td>
</tr>
<tr>
<td>Classroom Uses</td>
<td>33</td>
</tr>
<tr>
<td>Computers and Learning</td>
<td>30</td>
</tr>
</tbody>
</table>

Figure 15: Frequency Graph for Q7

Comments

Respondents were asked to rate the units from 1–4, with ‘1’ being the response for the most desired unit. This meant that the most desirable unit was the one with the lowest “total”. The researcher realised that the rating should have been from 4–1 so in the encoding process the scales were reversed.

Discussion

‘Classroom Uses’ and ‘Computers and Learning’ were clearly the most popular, but there was significant support for the other units. It was not unexpected that the most desired unit was Classroom Uses because this unit would appear to offer the most for classroom teachers. The unexpected result was for ‘Computers and Learning’. The researcher had delivered a similar unit at the Northern Territory University; it was not well received because students felt it was too much based on theory and not enough on improving classroom practice. Surprisingly the most “popular” unit in ratings at the end of the specialisation in the Masters program was ‘IT and Society’: In this survey it was not rated highly perhaps because, as several respondents said, it sounded too “airy fairy”.
Question 8

What other units would you like included?

Response

Table 11: Frequency table for 8

<table>
<thead>
<tr>
<th>Other units</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble shooting</td>
<td>14</td>
</tr>
<tr>
<td>Network management</td>
<td>10</td>
</tr>
<tr>
<td>Integrating IT</td>
<td>5</td>
</tr>
<tr>
<td>Others</td>
<td>7</td>
</tr>
</tbody>
</table>

Figure 16: Frequency Graph for Q8

Comments

Nearly 25% of respondents made suggestions regarding other units. On close examination most of these would actually be included in units in the proposed program.

Discussion

‘Resource Management’ could include the ‘Technical trouble-shooting’ unit mentioned by over half the respondents to this question. However consideration should be given to including such a unit with a technical focus as an option because, particularly in more remote country regions, it would be very useful to have a technical “trouble-shooter”. ‘The role of the IT Co-ordinator’ could either be included in ‘Resource Management’ or in a separate unit which could include the decision making processes in the planning and integration of IT. ‘The Internet, its uses and application’, ‘The computer as a tool and a revenue raiser’ and ‘Developing multimedia units’ could all be included in ‘Classroom Uses’. ‘Ethics and IT’ would naturally be covered in ‘IT and Society’. 
Question 9

How many of your colleagues would you rate in knowledge and skills in each category?

Table 12: Frequency table for Q9

<table>
<thead>
<tr>
<th>Category</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novice</td>
<td>340</td>
</tr>
<tr>
<td>Below Average</td>
<td>395</td>
</tr>
<tr>
<td>Average</td>
<td>708</td>
</tr>
<tr>
<td>Above Average</td>
<td>262</td>
</tr>
<tr>
<td>Outstanding</td>
<td>70</td>
</tr>
</tbody>
</table>

Figure 17: Frequency Graph for Q9

Comments

The wording of this question did not provide clear enough directions for respondents. Were they asked to rate their colleagues as personal users or as classroom users? The descriptors, particularly novice’ suggested to some respondents that the question merely related to personal ICT skills, when it really was looking at how successfully they had been able to integrate ICT into the teaching and learning in their own classrooms.

Discussion

The findings revealed very clearly that there was a critical need for professional development. More than 40% of the teachers were considered to be ‘novice’. At the other end of the continuum, given the fact that all teachers by 2001 in South Australia are required to be “ICT Smart”, less than 20% were considered to have successfully integrated ICT.

5.4.1 Results from Section B: Teachers’ professional development needs

This section, which contained eight questions, was designed to collect data about the specific workshop needs of other teachers as perceived by the respondents. Results from the analysis of the data are shown on the following pages. Responses are shown for each question and then there are comments and a discussion.
Question 10a

Should your colleagues be offered ‘Show-and-Tell’ demonstrations of new software and hardware?

Responses

Table 13: Frequency table for Q10a

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td>Undecided</td>
<td>6</td>
</tr>
<tr>
<td>Agree</td>
<td>39</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>47</td>
</tr>
<tr>
<td>Essential</td>
<td>33</td>
</tr>
</tbody>
</table>

![Figure 18: Frequency Graph for Q10a](image)

Comments

All respondents answered this question. They had to indicate their rating of the workshop on this 5-point scale with ‘5’ corresponding to the category ‘Essential’.

Discussion

Nearly 10% of respondents did not feel that there was a need for this type of workshop. When the researcher spoke to IT co-ordinators at conferences and professional development workshops, the reason for this was apparent. If it was just a ‘Show-and-Tell’ session why devote a workshop to it? Respondents felt this form of training was not effective because there was no participation by attendees. They suggested that a ‘Show-and-Tell-and-You-Do’ session would be of much more benefit.

These responses were more than balanced by the more than 60% who considered such workshops were very much needed or essential. These respondents felt that teachers would be given the opportunity to see what others were doing and could use the ideas if they wanted.
Question 10b

Should your colleagues be offered Software Training Workshops?

Responses

Table 14: Frequency table for Q10b

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td>Undecided</td>
<td>4</td>
</tr>
<tr>
<td>Agree</td>
<td>33</td>
</tr>
<tr>
<td>Strongly</td>
<td>54</td>
</tr>
<tr>
<td>Essential</td>
<td>38</td>
</tr>
</tbody>
</table>

Figure 19: Frequency for Graph Q10b

Comments

This type of workshop received the highest support (92.5%) of all and the lowest ‘No’ response.

Discussion

The fact that more than 60% of respondents felt this type of workshop was much needed or essential indicates how important teachers consider software to be. Teachers need to be able to use the most effective packages that will run on the computers they have. Several respondents pointed out that there has to be a clear distinction between being shown how to use the software and then being able to use it in the classroom. They said that

The first stage often doesn’t need a group workshop because of the tutorial programs that come with most packages. From the second stage teachers should go away with shared ideas on how to actually use the software with their students.
**Question 10c**

Should your colleagues be offered Hardware Training Workshops?

**Responses**

*Table 15: Frequency table for Q10c*

<table>
<thead>
<tr>
<th></th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td>Undecided</td>
<td>13</td>
</tr>
<tr>
<td>Agree</td>
<td>52</td>
</tr>
<tr>
<td>Strongly</td>
<td>38</td>
</tr>
<tr>
<td>Essential</td>
<td>24</td>
</tr>
</tbody>
</table>

*Figure 20: Frequency Graph for Q10c*

**Comments**

This question possibly had more significance to IT co-ordinators than classroom teachers. This is perhaps why there were more ‘Undecided’ responses.

**Discussion**

There was less strong support for this type of workshop than for any of the others. Less than half of the respondents strongly agreed or felt it was essential. But the number of respondents (n=52) who selected the response ‘Agree’ was the highest for all of the questions number of respondents agreed that there should be ‘Hardware Training.

Several respondents made comments in Q.12 about the amount of time they spent making a printer or computer work by simply hooking it up or turning it on. The IT co-ordinators, therefore may have had a self interest in this type of workshop, which they suggested did not have to encompass the very technical aspects but rather elementary trouble shooting and simple tasks like setting up a new computer or attaching peripherals.
Question 10d

Should your colleagues be offered hands on workshops?

Responses

Table 16: Frequency table for Q10d

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Undecided</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>8</td>
</tr>
<tr>
<td>Strongly</td>
<td>34</td>
</tr>
<tr>
<td>Essential</td>
<td>85</td>
</tr>
</tbody>
</table>

Figure 21: Frequency Graph for Q10d

Comments

This type of workshop was considered to be the most essential. Only two respondents were undecided and only five responded with ‘No’.

Discussion

This response confirmed the aphorism that has been the underlying philosophy of all the workshops I have conducted or been involved in over the past two decades. ‘I hear and I forget. I see and I remember. I do and I understand’.

Repeatedly in the open-ended responses to Question 12 was the criticism of existing professional development models for their lack of “practicality”. Respondents said that teachers wanted to be able to do something, knowing that when they returned to their own classrooms, they could replicate what they did at the workshop. This is sometimes a problem if they use more “sophisticated” hardware and software at the workshop than they have available in their own classrooms.
Question 11a

Should your colleagues be offered Internet workshops?

Responses

Table 17: Frequency table for Q11a

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Undecided</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>20</td>
</tr>
<tr>
<td>Strongly</td>
<td>54</td>
</tr>
<tr>
<td>Essential</td>
<td>57</td>
</tr>
</tbody>
</table>

Comment

Given the ever-increasing access to the World Wide Web and the advantages it offered to teachers and students it was not surprising that this workshop was so much in demand. Not one respondent selected the ‘No’ response.

Discussion

It is only recently that all DECS schools in South Australia have had access to the World Wide Web. This could be the reason why so many teachers were interested in a workshop on such a relatively new topic.

A second important use of the Web is to provide professional development for teachers. This is the approach used by the Technology School of the Future here in South Australia. The Web itself can be used to provide professional development on using the Web, particularly for teachers in more remote regions. This proposition was discussed in detail in section 4.2.4.
Question 11b

Should your colleagues be offered multimedia workshops?

Responses

Table 18: Frequency table for Q11b

<table>
<thead>
<tr>
<th></th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Undecided</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>25</td>
</tr>
<tr>
<td>Strongly</td>
<td>57</td>
</tr>
<tr>
<td>Essential</td>
<td>45</td>
</tr>
</tbody>
</table>

![Figure 23: Frequency Graph for Q11b](image)

Comments

The interest in this workshop was not expected given the fact that the use of multimedia has been popular for well over a decade. It is the one of the most common uses of ICT in classrooms. Students as early as Year 2 are producing multimedia presentations, which use software programs such as KidPix or PowerPoint.

Discussion

From my visits to schools and working with so many teachers and students, the use of multimedia software is very prevalent, with children as young as five being more than proficient. When teachers see such young children presenting projects in multimedia format with sound, text and images, they must feel that they should be able to do the same. This must encourage them to see how other teachers have made effective use of multimedia software.
Question 11c

Should your colleagues be offered desktop publishing workshops?

Responses

Table 19: Frequency table for Q11c

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reply</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Undecided</td>
<td>0</td>
</tr>
<tr>
<td>Agree</td>
<td>29</td>
</tr>
<tr>
<td>Strongly</td>
<td>54</td>
</tr>
<tr>
<td>Essential</td>
<td>50</td>
</tr>
</tbody>
</table>

Figure 24: Frequency Graph for Q11c

Comments

Responses showed clearly how important desktop publishing is considered to be. All respondents indicated that they felt there had to be such workshops.

Discussion

Because composition and text-based work is still considered so important in R-7 schools, it is obvious why there was such unanimous demand for this type of workshop. Visits to classrooms or viewing displays on an Open Day, show how much emphasis is still placed on such output.

It was surprising that so many respondents thought such workshops were essential because from my visits to schools, this would appear to be an area of computer use, which has already been well covered. It can only be assumed that once again some teachers feel that their students are more capable than they are, and therefore they need the professional development to catch up.
Question 11d

Should your colleagues be offered Cross Curriculum Workshops?

Responses

Table 20: Frequency table for Q11d

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Undecided</td>
<td>7</td>
</tr>
<tr>
<td>Agree</td>
<td>16</td>
</tr>
<tr>
<td>Strongly</td>
<td>54</td>
</tr>
<tr>
<td>Essential</td>
<td>57</td>
</tr>
</tbody>
</table>

Figure 25: Frequency Graph for Q11d

Comments

Of all the workshops this was the one that this researcher thought should have been the most desired, given that all R–7 teachers are now expected to be able to use IT where-ever it is appropriate in all curriculum areas. This workshop was considered to be the most necessary.

Discussion

The expressed need for this workshop was not surprising. At a workshop like this teachers would be able to share ideas and take away with them examples of what they could use immediately in their own classrooms. The practicality and value of such workshops is obvious and it was possibly for this reason that more than 80% of respondents felt so strongly about the need for workshops in this area.
5.4.3. **Results from Section C: Respondents’ comments**

This last section of the survey-questionnaire, which contained only one open-ended question, was designed to give respondents the chance to make any comments or suggestions about the study itself or the area of professional development in IT in general.

The responses are summarised on the following pages. Because respondents would in no way be identified, they may have been more open and frank in what they said. The data collected was therefore very “rich”. Responses were received from nearly 40% of respondents. Many of these wrote at considerable length about their problems and concerns. The comments were perceptive, critical and yet constructive.

These data were transcribed and then analysed using NUD*IST to extract meaning by identifying recurring ideas and organising the comments into nodes. From these a series of main themes were identified. Notes and memos were made at the time for future reference or responses to follow up or investigate further. An example of a print out of an analysis of one section of the data is to be found in Appendix E.

Three themes were identified which all considered aspects of the issue of professional development in both formal and informal modes. The first theme encompassed comments about the need for professional development and the problems associated with existing models. The second theme encompassed suggestions for more successful models. The third theme encompassed comments respondents’ interest in a coursework masters program and what should be in it.

Respondents were only identified by a coded number. For example, comments from Respondent 1 were acknowledged by R1 after the quotation.

**The problem**

It was clear from so many responses that there is an urgent need for professional development in IT, particularly in the country. This situation was quantified earlier in this chapter in the analysis of the responses to the survey.

Often the comments related to activities that respondents had been involved in themselves. Examples of responses cited are typical of many similar ones. The first
was a response received back, less than a week after the survey went out. It was from a male teacher in the city who did have a formal qualification (a Graduate Diploma in Educational Computing).

R1: Teachers refuse to give up their own time to train in something they believe their employer should train them in. This is what holds most of them back. At present the Education Department does not really take training in IT seriously. It has out-sourced everything, which it used to do before and now the private sector provides training at an expensive rate that the schools can't really afford. The training money given by DETE is not enough to release each staff member for 1 day's training per year. Teachers think this is a joke and so their attitude is if DETE doesn't really care, why should they. Time has to be made available for staff to do PD courses.

Many similar comments were identified in this analysis. These were included here because his responses made such an impression when they arrived so quickly and with so much detail and feeling. Many comments related to what respondents had done on an individual level out of self-interest or preservation. Then there were comments on activities at the workshop level and organised in-service programs. Finally there were details, and comments on, any formal academic study they may have undertaken.

R3: DETE has failed to recognize the needs of country teachers. Offering courses and training in Adelaide at the individual’s expense is not a substitute for regional training.

This comment and the following ones were typical of many others, mainly from country regions.

R33: In country S.A. training for staff in any use of computers is all but impossible to access. It's not generally available locally: people have to travel many hundreds of kms. Even if it is available people are often not able to be released because of limited budget to provide temporary relief or in many areas the complete non-availability of temporary relief teachers. The increased work load and demand on teachers time in the last three years to participate in management of the school seriously limits the viability of providing afternoon or early evening courses.

R21: If the Education Department expects all teachers to have appropriate IT skills, then it is its role to provide the opportunities.

R52: DETE expects teachers to be computer literate and helps provide the equipment and software, but unlike private enterprise, it doesn’t provide sufficient training.
A typical response from a country IT co-ordinator (R47) in writing of how he had acquired his skill and expertise said they had been gained ‘through personal experience, mostly out of hours and all at my own expense.’

He continued by outlining the problems with current professional development provision and concluded with a series of positive suggestions, which are discussed later in the section, ‘A new approach’.

R47: DETE expects teachers to be computer literate and helps provide the equipment and software, but unlike private enterprise, it does not provide sufficient training.

The following comments identified difficulties particularly relating to country teachers.

R63: In remote areas of South Australia training for staff in any use of computers is all but impossible to access.

A frequently raised concern from country respondents related to the fact that from remote regions it is very costly and time consuming to send teachers to even a regional centre for training. Even if P.D. is available teachers have to travel long distances and they have to be “covered”. This is often a problem due to a limited budget or lack of available relief teachers.

Increasing workloads and demands on teachers’ time have dampened the enthusiasm for after school or evening workshops as indicated by the following comment.

R93: At the moment our teachers feel they do not have the time to commit to improving their skills and expertise. There are too many other demands on their professional time.

The report of the ‘Making It Work for All’ project in Elective Research Study 2, concluded that the short “quick fix” workshop or even one or two day training days are not successful because they do not address the learning styles needed for the acquisition, and application, of new skills. This was alluded to in this comment.

R9: A one or two day course becomes a blur in most participants’ minds, particularly when they cannot immediately continue to use the skills introduced.
A new approach

Following the criticism of existing models, this respondent made these comments, which provide the essence of what constitutes a successful professional development activity.

R13: Effective learning is based on an immediate need to use the skill, to put it into practice and evaluate your efforts, revisit the skill and feel confident you have mastered it.

This comment from a city respondent offered an excellent suggestion.

R19: From my experience "one off" workshops are not the most effective way to achieve a good result in T & D. A short course where confidence can be gained each week, practise time is possible and there is someone to answer questions, seems to work better. An Internet café in our school has been very effective whereas "one off" sessions to teach the Internet are more awareness raising even when they are hands on

These suggestions from a country respondent also some clear directions for what should be a more effective approach.

R77: It is my belief that a more flexible approach by DETE needs to be adopted, which takes into account regional needs.

Those IT co-ordinators who have the appropriate expertise and skills should be in a position to provide professional development for their own teachers and within the region. In the same way that CEGSA is seeking accreditation as a professional development provider in IT, schools or regions could do the same.

The same respondent concluded that:

R77: We, for example, could be given funding, through an application to DETE, to carry out our own training. All we would need to do is map out our training program in applying for funding, have it approved, if worthwhile, and put it into practice.

Comments on a Coursework Masters program

The first three direct quotations reflect the note of reservation that many respondents had about undertaking such a program. These are followed by a summary of comments made and questions raised in relation to the rationale for such a program, its content and its delivery. Many of the concerns and issues raised by the teachers who responded to this question, were also raised, and in many cases resolved, by the
respondents who indicated they were definitely interested in undertaking a coursework MEd. A discussion of their responses is found in Chapter 8.

R:37 The course sounds like a wonderful idea but you need to take into account the fact that the average teacher is 47, that makes most of them over 40. They are not interested in going back to college where they lose money by having to pay fees (remember most of us went through University when it was free).

R17: It costs money and they have family and other commitments. Before fees were introduced many teachers undertook part time study to upgrade qualifications and or improve skills and knowledge.

R27: It is my experience (now considerable) that what Unis want to offer me and what I want are poles apart…I don’t appreciate paying lots of money only to find out that I could have conducted most of it myself.

Summary of other comments made

- The program should be open to all teachers and not just IT co-ordinators.
- There should be a strand for non-classroom teachers.
- The program should cater for teachers who are already involved in IT and interested in pursuing a career path.
- Why would teachers want to undertake the program?
- How will it help bring about change at the school level?
- What reservations would teachers have about the program?
- What incentive is there to undertake this course of study?
- Why should teachers, whose average age is now over 40, want to undertake any such course?
- How will it cater for the needs of country teachers?

These comments were typical of many (21/34) similar replies identified in this node.

In summary, although many respondents (19/34) were interested in a MEd, several (4/12) respondents who took courses in the past pointed out how irrelevant and obsolete they were. The MEd program proposed here would be structured to meet the needs of its clients and to ensure that its content was kept current. There is a place for action research for some teachers, but for many there is a more practical need. There needs to be units, which look closely at available software programs and
develop ideas on how they can be used to enhance the teaching and learning environment in the classroom. In addition, there is a place for a technical unit, particularly for teachers in remote regions.

Because of the problems with delivery of practical units a country respondent (R41) suggested the idea of an intensive “live-in course”. It was apparent that there was very little interest in the on-campus mode and so it was not surprising that the electronic delivery mode was so popular.

5.4.4 Results from cross tabulations

This section discusses the results from the cross-tabulation between various questions. This process was carried out to identify more precisely where specific needs were to be found. This was done by examining the possible relationships between the results from one question and another.
Cross tabulation 1

Q1 Are you city or country based?

and

Q4 Do you have any academic qualification in educational computing?

Results of the cross tabulation are shown in Figure 26:

![Figure 26: Qualifications](image)

Comments and discussion

Twenty respondents indicated that they had an academic qualification. This represented less than 15%. Eight were from the country and twelve were from the city. Of these formal qualifications, seven referred to a major in a BEd or DipEd, twelve to a Graduate Diploma and one to a Graduate Certificate. Of the twelve respondents who had a Graduate Diploma in Educational Computing, only five were from the country.

In view of the fact that the number of replies from Country (67) and City (68) was almost identical, statistical tests were carried out to see if this apparent imbalance in qualifications was statistically significant.

The correlation between location and qualifications was so low (r = .06) that it could not be shown that respondents who lived in the country were statistically less likely to have formal qualifications than those who lived in the city.
The small sample size (n=135) could have been a reason why there was no significant statistical probability that there will be a significant difference in the qualifications of country and city computing co-ordinators.

The second statistical test carried out was a chi-square test. The chi-square test confirms whether the two independent samples, country respondents and city respondents, have significantly different distributions across the two categories, qualifications or no qualifications and may, therefore, be considered to have been drawn from different populations. In this case it confirms whether the frequencies obtained in the cells of the contingency table are different from the frequencies you might expect on chance variation alone. The test compares obtained frequencies to expected frequencies and indicates the probability that they are different.

The numbers in the contingency table shown below represent in this case the distribution of the two samples, country respondents and city respondents, across two categories, having a formal qualification and not having a formal qualification. In this case considering the contingency of a country respondent having a formal qualification, eight out of 135 respondents are to be found.

<table>
<thead>
<tr>
<th>No Qualifications</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>City respondents</td>
<td>56</td>
</tr>
<tr>
<td>Country respondents</td>
<td>59</td>
</tr>
<tr>
<td>Totals</td>
<td>115</td>
</tr>
</tbody>
</table>

*Table21: Contingency table1*

The calculations were carried out using an example from Tuckman. (1988, p. 253).

<table>
<thead>
<tr>
<th>No Qualifications</th>
<th>City</th>
<th>Country</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56</td>
<td>59</td>
<td>115</td>
</tr>
<tr>
<td>Qualification</td>
<td>12</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Totals</td>
<td>68</td>
<td>67</td>
<td>135</td>
</tr>
</tbody>
</table>

*Table22: Contingency table2*

The results of the calculations are the same. The conclusion is that respondents without qualifications and those with qualifications are distributed significantly differently across the two categories city based or country based, hence justifying the inference that IT co-ordinators with qualifications are significantly more likely to come from the city than from the country.
Data in this two-variable case were cast into the contingency table shown above. When the work-sheet formula for a 2x2 contingency table was applied to the sample data, it yielded a chi-squared value of 1.383 for a $df = 1$. Because this calculated chi-squared value did not exceed the value of 10.83 given in the tables for the critical value of Chi Square at a $p$ level of .001, then this obtained value for a $df = 1$ could not be considered significant at that $p$ level. This leads to the conclusion that city and country respondents are not distributed significantly differently across the two categories qualifications or no qualifications. This means the inference can’t be justified that that IT co-ordinators from the city tend to be more likely to have qualifications than co-ordinators from the country. So no inference can be drawn from the fact that 50% more respondents from the city had qualifications than country respondents.
Cross tabulation 2

Q1 Are you city or country based?

and

Q5 Would you consider undertaking a Coursework Masters in Classroom Uses of IT?

Results of this cross tabulation are shown in frequency graph below.

![Figure 27: Consideration of Masters by coursework](image)

Comments and discussion:

The response ‘No response’ was included because it reflected what turned out to be a poorly worded question. It could have been interpreted that only respondents who answered ‘No’ to Q 4 ‘Do you have any academic qualification in educational computing?’ were expected to answer it.

In fact several respondents who already have a qualification did respond to Q5. Three of the respondents who already had a Graduate Diploma in Educational Computing were interested in undertaking a Masters.

Analysis of comments in Question 12 and from the follow up interviews with respondents who answered ‘Definitely’ reveal possible reasons for this.

The larger ‘No’ response from the country could perhaps be explained by problems associated and experienced by respondents in relation to other studies taken externally.

The fact that nearly 80% of respondents indicated that they were interested in undertaking an MEd gives clear support for such a program. This issue is discussed further in Chapter 8 Discussion of research findings and Chapter 10 Conclusions, implications and recommendations.
Cross tabulation 3

Q1 Are you city or country based

and

Q5 Would you consider undertaking a Coursework Masters program?

and

Q6 Which mode of delivery would appeal most to you?

Results of this cross tabulation are shown in the Frequency graph below.

![Frequency graph showing mode of delivery preferences](image)

*Figure 28: Mode of delivery*

**Comments and discussion:**

In this analysis only responses of ‘Possibly’ or ‘Definitely’ from Q5 were taken into account.

The Electronic mode of delivery was the most popular with city and country respondents. It was interesting that so many city respondents were interested in conventional off campus external delivery or distance mode which would use a basically text based approach.

There was little interest in the On Campus mode. It is interesting to note that the University of South Australia in 1998 did not have any students enrolled in this mode in their coursework Masters program.
Cross tabulation 4

Q1 Are you city or country based

and

Q7 How would you rate the suggested units?

Results of this cross tabulation are shown in the Frequency graph below:

![Frequency graph showing ratings of units for city and country respondents.](image)

*Figure 29: Rating of units.*

Comments and discussion:

The numbers of respondents from the city (n=68) and the country (n=67) were almost exactly the same. The units were rated in the same order and responses to each individual unit were almost identical.

As 80% of the respondents had indicated they were possibly or definitely interested in undertaking an MEd these figures would suggest that a consensus does exist in terms of the units which could be offered in such a program.

IT and Society was considered to be the most needed unit. This is a unit which would not have any “hands on” component. This might appear to be unusual but the researcher had found that a similar unit, Social Implications of Computers, which he delivered at this level at the Northern Territory University, was highly successful in terms of numbers of students and in their response to the unit.

Resource Management which would encompass the many facetted roles of an IT Coordinator was quite clearly the second rated unit. It would equip graduates to be
able to deal with technical aspects as well as providing professional development for colleagues.

Computers and Learning which would provide the theoretical background for classroom uses of IT was not rated nearly as highly. A possible reason for this could be that respondents had reservations about the value of such a unit.

It was surprising that Classroom Uses was rated the least desirable but this could be perhaps because potential students of such a program would already be very familiar with this area.

### 5.5 Concluding comments

This section provides a discussion of the results given in the previous sections of this chapter and discusses the significance of the findings and their contribution to the rest of the investigation.

#### 5.5.1 Rate of returns

The percentage of questionnaires returned was nearly 30%. The researcher initially considered this was a lower than expected return rate, but three factors have to be considered. There is normally a low response to a mailed out survey. (Tuckman, 1998, p. 113) The timing was close to the end of term. The Department of Education distribution centre sent out an unauthorised accompanying letter, requesting the return of the survey by the end of the week in which they were sent out. The response rate was therefore perhaps greater than expected.

This may have been due to the researcher’s P.D. work in both country and city regions, which had made him known to a wide group of teachers, but more likely because of the interest of the teachers concerned in the issues under investigation. Less than 5% indicated that they did not wish to participate further. This may have also been the reason for the higher percentage return from the country, nearly 35%, compared with the city percentage of just over 25%.

More than 90% of respondents answered all questions, which were applicable. This would appear to indicate that they had been motivated to work through the whole
instrument. Of the total number of respondents less than 60% actually had the title of ‘IT coordinator’.

5.5.2 Limitations of the survey

It was assumed that the teachers who responded to the questionnaire-survey for MEd a representative sample of the Reception to Year 7 Information Technology co-ordinators. It also assumed that these were the IT co-ordinators who were most interested or concerned.

The data collected on the level of expertise of classroom teachers was based on the perception of these co-ordinators. If such figures, namely that almost half the teachers were rated as below average, were applied state-wide, then there is no doubt that there is an urgent need for professional development in classroom uses of information technology.

The sample was large enough to indicate that, statistically, a researcher could make reasonably confident inferences about the total population. Robson (1996, p. 50) warned that from a psychological point of view there could be scepticism about the real message contained in possibly perfunctory individual responses. In real life when market research or survey forms are filled out, there has to be doubts about how trustworthy other responses would be when aggregated.

With hindsight, it was obvious that the questionnaire used could have been more clearly worded to minimise possible ambiguities in respondent interpretation. The effect of these problems was raised (in some cases) in the Comments and Discussion sections in Chapter 5.

Q.4 could have been better worded with a definition of “academic qualification”. Q.7 could have been better worded with a brief outline of each of the proposed units, even though respondents in South Australia were familiar with the titles of these units. Q.9 would have been clearer if it included an explanation of what each category referred to.

Section B. could have been more precise in stating that the “they” and “their” refer to the other teachers in the school.
5.5.3 Analysis of results

An analysis of the results showed that although a majority of R-7 teachers, nearly 60%, were considered to be average or better users of IT, more than 40% were considered to be below average. Of nearly 50% these were rated as being novice users.

It was very revealing that less than 10% of the IT co-ordinators had a formal qualification in Educational Computing. Over 80% of respondents indicated they would be interested in undertaking the coursework Masters program that was the end point of this overall study.

The survey results indicated that there is an urgent need for professional development in IT, particularly in the country regions. They provided details of what the specific needs were and indicated that teachers felt that DECS needed to urgently address this situation. They revealed that there would be significant interest from these respondents. At least, in a Masters program, which could be delivered using flexible delivery modes.

In doing so they provided answers to the research questions outlined in the introduction to the Folio. They provided information, which the researcher was able to use to write a successful submission for the state-wide professional development project described in Elective Research Study 2 in Part B of the Folio. They also provided direction and ideas for the research, which is described in Chapters 6 and 7 and for the framework for a MEd, which is discussed in Chapter 9. They also affirmed the underlying conception for the whole investigation that a significant number of R-7 teachers in DECS schools in South Australia needed assistance if they were to be “IT Smart”
Chapter 6

Presentation and discussion of results of interviews

6.1 Overview

This chapter begins with an outline of the three types of interviews which were conducted. This is followed by a summary of the transcripts of each interview and the chapter concludes with a synthesis of all the interviews.

Interview Model 1
These interviews were with individuals from South Australia, who were recognised leaders in this field.

Interview Model 2
These interviews were with keynote overseas speakers at conferences the researcher was involved in as a presenter and organiser.

Interview Model 3
The group to be interviewed were the respondents to the survey, who indicated they would definitely be interested in undertaking a Masters level program.

6.2 Interview Model 1

Procedure

Four educational leaders in South Australia, to whom I was well known through my professional development activities, were contacted and asked if they were willing to be interviewed. If they were, they were sent this list of questions to be discussed.

- Is it realistic that all teachers will be IT Smart by 2001?
- What sort of help do teachers need?
- Who will provide it and how?
• What models of PD work and what ones don’t?
• Can IT be used to deliver PD in IT?
• Is it a problem that only 5% of IT co-ordinators have a formal qualification?

Each interview was prearranged and interviewees were given the list of the questions beforehand so that they were able to think about the issues to be discussed. Each of the interviews lasted between 30 and 60 minutes and was recorded for later transcription, interpretation and analysis. If they were willing, permission was obtained from participants to include extracts from the transcripts in the dissertation itself.

After each interview, I made any appropriate entries in my Journal and carefully reviewed my hand written notes taken during the interview, making further points or clarifying what was there. The tapes were numbered and coded with Subject X and given to a commercial firm for professional transcription. Usually I went to see the transcriber while she was working on the tapes because there were always parts, which needed clarification, particularly with the overseas interviewees. The transcripts were emailed to me as Word documents with some spaces and queries and question marks. I then edited the files by listening to the tapes as I read the transcripts I put in the code letters (X,Y,C.) for the interviewees and an ‘I’ for myself. Because of my background as teacher of English, I was able to make sense of what was often fragmented text because people don’t normally talk in sentences. Because I was so familiar with the material and the work of the interviewees, I felt I had a real sense of understanding.

A second more “polished” version of the transcripts was then made and compared with original tape. At this stage because of the sheer number of pages involved it was difficult to elicit the main issues from each interview let alone from them all. I had been able to identify a set of common issues but I realised I needed to be more precise than this.

All of text in the files of the transcripts was then reformatted so that the data could be analysed using NUD*IST. These files were then sent to the NUD*IST expert who had analysed the written responses to Question 12 in the survey described in Chapter 5. From this analysis, that confirmed what I had established intuitively and from my notes and observations, I was able to write up these sections in this chapter. This was
a very time consuming and expensive process but the data I was able to obtain was so “rich” and the detailed analysis of it provided me with an invaluable source of original material which supported, and gave extra credence to, other findings from the study.

A summary of the contents of the transcripts of each interview, with my observations and comments, is provided here.\textsuperscript{53}

6.2.1 Interviewee 1: Senior Educational Advisor (X)

I had been closely involved with Subject X through my involvement with CEGSA and she accompanied me on one of the country workshops as part of the CEASA funded professional development project described in the Part B. She was also one of the respondents to my state-wide survey.

\textbf{Is it a problem that only 5 \% of IT co-ordinators have a formal qualification?}

X expressed surprise that so many IT coordinators were interested in a MEd. Her own University experiences had not been very constructive or helpful. As a former IT coordinator herself, she made this reflection on why she was surprised. ‘I reckon that the majority of teachers have just picked all of this stuff up and don’t really have any great interest in formal qualifications.’

\textbf{Can IT be used to deliver PD in IT?}

Because of her position, X had already investigated this approach. She remarked that it was easy to focus on skills acquisition, but the real challenge was to provide ‘the curriculum part of the stuff.’ We talked about the Technology School of the Future (TSOF) Website and how it was providing support rather than formal PD. She cited examples of ‘posting’ ideas that had worked well or a series of lessons on a particular topic.

\textbf{What models of PD work and what ones don’t?}

The discussion about on-line delivery of PD resulted in mixed conclusions. The TSOF does provide such PD but the question was how successful had it been? We

\footnote{\textsuperscript{53} Because of space constraints in this Folio all of the transcripts have not been included in the Appendices. They will be on the CD-Rom that will be included with the Library copies}
agreed that most teachers pick up ideas informally or as they need them rather than attending or accessing formal PD sessions.

6.2.2 Interviewee 2: Senior Project Manager (Y)

I had been closely involved with Subject Y through my involvement with CEGSA and my state-wide PD activities and on planning for IT conferences.

Is it realistic that all teachers will be IT Smart by 2001?

Y began the discussion by challenging my use of the term “IT Smart”. She considered that it was a political term.

‘It’s the notion – it’s a political term that refers to society. So, it’s like an industrial revolution – a knowledge revolution – an agricultural revolution – where you talk about a society which is now IT Smart because of – a technological revolution. Yes. But if you’re talking about classroom practice and teachers and professional development, your goal might be that everyone in the department and the kids that we teach fit into an IT Smart society’

She said that she preferred to talk about embedding learning technologies in the classroom practice, so it’s woven into the fabric of the teacher’s life.

What sort of help do teachers need?

‘I don’t have any statistics, but what I do know, and what I can answer from experience is that there is a real need for professional development. But we are nowhere near where we want to be as far as teachers weaving IT into the fabric of their daily work.’

What models of PD work and what ones don’t?

Having established that there was definitely a need we then looked at providing a solution. We started by being critical of the existing models that I’ve been involved in. The whistle-stop or the fly-by-night country workshop that just doesn’t work.

Y then gave details of an investment of $7.3 million in a model that she thinks is working.
Her section had carried out considerable research and found that the Principal is the key.

‘We’ve done a fair bit of research. We believe that it’s based firmly on the systems thinking of things – that it’s about whole school change – that the Principal is a vital cog. Well, not only – he’s not a cog, he’s really the starter button, but . . .’

There is no doubt that Principal has to be on board but we both firmly believe in classroom-based professional development. Teachers learn and like to learn from their colleagues.

‘We believe that it should be project based – professional development, not the “you beau”t one-day wonders and so our major thrust in the Discovery Schools is three day programs where teachers come in pairs and they do some learning. It’s – very little skills involved. They get involved in some learning. They do an Action Plan, they go back to their school and they implement that Plan and they come back about 4-6 weeks later and the whole group share their learning. Attending those 3-day courses is the Principal – the Principal is asked to come for all or part of, to support their staff. Early indications are that Principals attending all or part of the course – Principals or Deputies for 75% of the time, and once we’ve got some stuff back from the evaluation … Oh, the other thing that our programme is based on is follow up support after the event. So that, once you’ve done your three days, you don’t just – you’re just not left there.’

We then discussed the need for follow up support and the training of Principals, which are all part of a multi-plan strategy. Y gave me details of a Principal-ship programme that involves Principals, Deputies, and might involve Assistants. They need to be offered professional development as users, as curriculum leaders, and as decision-makers about Learning Technology resources in the schools.

We agreed that it’s not about being merely technology driven. The vital factors are the learning outcomes and being able to articulate the methodologies you use to get the sorts of learning outcomes that you couldn’t get if you didn’t have the technology.

Y concluded this section of the interview by giving details of a successful model known as the Discovery Network for teachers. Each year twenty exemplary learning
technologies practitioners are selected given release time from their normal positions. These teachers are not necessarily outstanding IT users or exemplary teachers. They had to be able to articulate learning outcomes from using IT in the classroom. Otherwise they are just ordinary teachers.

They are then available when other teachers ring and say, ‘Can I come and see what you’re doing?’ and then they say, ‘Yes’ and then go away and tell a couple of people, so two more people ring up and say, ‘Can I come and see what you are doing?’ and so on.

‘And the other thing is that they don’t ever get time – not only do they get burnt out, but they never get time to explore further and develop further the good stuff that they’re already doing. So what we do is we give them release time and we say to them - that is equivalent to a day a week if you look – so one day a week you should be reflecting on your own practice, experimenting, trying new things, undertaking professional development.’

They have another other day each week when they share whatever they are doing. This can be through classroom visits, and it can be through developing teaching resources that are put up on the Web. It can be presenting at CEGSA or it can be writing a report. The model works very well because teachers, who go to their classroom visits, can really identify with collegiate professional development.

Finally, we considered some of the issues. What are some of the things that teachers are asking for? What are some of the things that they value when they go to the professional development? What are some of the things that they want to follow up on?

The most important issue for these Discovery School teachers is the their impact on other teachers in other schools. They’re doing classroom visits which means they might run half a dozen class room visits. Teachers also come to their classrooms

So they might contact a hundred colleagues personally but because teachers can pull down their resources off the web and use them, they “contact” many more than this. They also speak at conferences.
As well, there are three Global Discovery schools, Edithburgh, Cooper Pedy and Kongarong, which are all in rural country areas – remote or country areas. They are supported to explore the use of on-line technologies, to overcome the difficulties of isolation, the disadvantages in education caused by isolation and distance. Their model will be sharing their ideas through the web.

The other thing we have is a leading edge professional development programme. The question is how do you excite and challenge those who are already at the forefront? If you don’t keep these teachers moving along, the situation remains static. What we’re doing is, we’re casting lots of different seeds. We don’t believe that any one strategy will hit the mark. We believe if you throw enough seeds out there. Some is whole school and some is based on the individual.

The other point is that we think that everything should be underpinned by classroom based research. Some of this is informal feedback. We are just starting out by collecting base line data.

The University of South Australia has just started researching into four areas. The research is done in the Discovery Schools. We are using them as our research bases.

This is a collaborative research project, which will be a two-year project and we are just trying to stitch up a longitudinal study on ‘What are the constructive teaching methodologies that transfer learning outcomes in technologies in the classrooms.’ ‘What are the teaching outcomes, what are the learning outcomes that you get? ‘ ‘What does the professional do - devising a professional development model to pass this on’ and ‘testing out that professional development model’. So research is a major programme – part of it. So we’ve got some pretty strong beliefs about professional development.

Returning to the question of ‘What models of PD work?’ Because Y had conducted her own research and had a strong professional development background, a lot of it was what she knew worked, and knew it had to be followed up into the classroom.

‘Can you use IT to deliver PD?’

If we are talking about on-line learning, that’s pretty broad really. It could be just using computer-based training, or obtaining resources. This is a way teachers are using their own networks to communicate with other people.
Some of it’s district-based, but a lot of it’s state-wide. But if we are talking about on-line learning, Y said she believed strongly in that because she had a very strong background in that even though she said she had seen some incredibly bad on-line material.

At this point we established that in talking about delivering PD in IT, I was talking about skill acquisition and about using it in the classroom?

**Is it a problem that only 5% of IT co-ordinators have a formal qualification?**

I: Now, this last one is really about my research and it’s not really your area at all, but it is this fact that so few of the IT coordinators have any formal qualifications in the area.

Y: I can answer that easily. Moreover I don’t see it as a problem at all. However, in the daily discharge of their duties. However, I know that we are way behind in, as a nation, in qualifications when we’re compared with other countries. And I know, two or three years ago, they started a giant push – well even before that with the Australian Qualifications framework, it was an attempt to get us better qualified in comparison with our international friends. But even in the last couple of years, I saw some reports that came out from the OECD and we’re miles behind in qualifications. So if it affects our trading ability, if it affects our national status, I would in general be concerned about everyone’s qualifications, but as far in the discharge of their role, I don’t have a problem with that at all.

We then talked about a proposed model for a MEd in Classroom Uses of IT. It was a proposal for an electronically delivered Masters Course, which involved no skill based stuff, because you’re assuming these people already have the skills. And it involved a series of units – we call them course work for want of a better word, which built upon what they were already doing. They could get recognition from prior learning and that, and then the second half of the programme would be an action research project or a project that they use in their schools.

Suggested units were – you’d have to have Computers and Learning, some sort of theoretical background in what you were doing and looking at the research. And the second one – a lot of them said a unit involving something called Resource Management. You know, that was people, the network, the organising of professional
development. The third one that came through almost strongest on the units they wanted, was something about ‘Information Technology and Society’, social impacts, and I found that one quite interesting.

Y: So I think what we’re saying is that they don’t feel equipped to do their job and I would say that would be true of every single teacher in the state. Because we’ve had such rapid change in such a short period of time.

There are new understandings about learning now. There are – we’ve added technology into the equation, we’ve added Global School budgeting into the equation – which affects everybody. We’ve added – in the last few years – in the last decade look at the different content area that we’ve added, and so I would say that every teacher would be feeling pretty insecure about their abilities at the moment. And they would see the opportunity of study as really useful. I think that is why we get so many people at professional development things, because people recognise that.

Y: Yes, so if you’re talking about a course for learning – fine. If you’re talking about a course for qualification, which is what I thought you were saying, that they were after the qualification rather than the learning – if they’re after the learning, that is fine. The more options we can give them, the better. In fact, we’re trying to link all our PDs to qualifications and all the stuff we’re doing would be linked into the graduate certificate, if only I had time to get it set up.

We finished by agreeing that my main target of a MEd was perhaps a little too high. Perhaps it may be the graduate certificate area, which could be a stepping stone.

Y: Well you would need to investigate with the Training and Development Unit, because all of that is just changed and as far as this Department is concerned, there is a certain process that you go through and there are only two Certificates, two qualifications into which you can feed now with professional development, unless the Universities set up their own. One is a Masters and I think the other one is a Graduate Certificate.

6.2.3 Interviewee 3: Senior Education Department Officer (K)

I have known Subject K for nearly 20 years. I have been closely involved with him for more than a decade through my involvement with CEGSA and its state
conferences and state-wide professional development activities. As well as one of the committee members of the Australian College of Education responsible for the planning for its 1998 IT Conference, I approached him for support and assistance in his official capacity. In this interview he was speaking from his position in the Education Department and he agreed to discuss a range of issues and perhaps what could be done about them.

I began the interview by sharing with him some of the key findings from my state-wide survey that revealed that nearly 40% of the teachers, who were surveyed, were considered to be below average users of ICT.

**Is it realistic that all teachers will be IT Smart by 2001?**

We began this discussion by looking at three factors: the figure cited above: the expectation that all teachers are required to be “IT Smart”: the average age of teachers is nearly 50. K started by commenting that he felt we should be cautious about ‘survey stuff’ from overseas reports.

*K: When I think about the figures – the survey stuff, and I know the STaR Report and also similar reports from the U.K., they’re a little bit flawed, because it’s actually what you set the benchmark on.*

We agreed that it is very difficult to define what we mean by a ‘competent ICT teacher’. The figures and statistics and research only give some pointers but there is no doubt that there is a PD development problem. K pointed out that teachers now had very different needs to those he had worked with in the 1980s. He was able to describe how the profile of a trained IT teacher had changed.

**What sort of assistance is needed and who will provide it?**

The Education Department has set a series of targets which teachers are expected to reach. Even though K was critical of some of the outcomes because they were ‘technically skilled’ ones, the initiative of giving schools quantifiable targets has helped schools in their performance management. It has also allowed the Department to map the development by measuring improvement against those targets.

The Department provided $5 million in funds, much of which went directly to schools for their own training schemes rather than a system-wide approach.
What models of PD work?

*K:* The problem in making measurements on teacher development in the IT area, we’re dealing with a pretty changing, rubbery target and it’s almost like there’s more invalidity about the data than there actually is validity. But if you actually look at the qualitative stuff, the quality of stuff’s a bit dodgy, but the qualitative stuff says we probably need to do more. Now in a sense it’s probably not because of what we’ve done is completely wrong – I think what we’ve done is learning in the past.

K emphasised again that models from the 1980s were not much help today other than to remind us that those models were for a very different type of development program.

The ageing population

*K:* The average age of teachers in South Australia is actually just under 47. That means they’ve got an average 13 years to teach. It would be very hard to say that such teachers are actually incompetent or not competent. I think there will be significant changes anyway in technology during the next 13 years. I think the interesting thing I’m finding is that sometimes it’s not necessarily associated with age, but related to commitment. So I’ve actually seen my best examples with teachers who are in their late 50s with the technology are their readiness to change. The biggest change agenda I see is moving from a teacher centred environment to a learner centred environment.

I: This is what I found in my own research and PD work: it was not the age of teachers but their “mind-set” that was more significant in their attitude and approach to the use of IT.

K expressed some reservations about the validity of qualitative data.

A lot of people in the qualitative stuff, that’s where they’re critical. So it ends up being the sort of cat and dog after work model of everyone’s got a frustration. And it’s the frustration of that. If I don’t want to change, I’m stable in what I do then technology is the problem. I think that’s a critical bit in the analysis.
K went on to say that he was a strong believer in the Dwyer Entry Adoption Adaption, Appropriation model from Texas. The bulk of teachers have passed entry i.e. how to technically turn it on.

I: At least you have teachers actually using the technology.

K: We’ve got some, a fair percentage now – a large percentage have adopted it, are actually using it. Still tends to be a little bit complementing their existing programmes in schools. We’ve got a big percentage coming through with adaption where they’re starting to do different stuff, and you might be interested to know that already South Australian teachers are 400% greater uses than Queensland teachers in email from our early preliminary studies. South Australia actually is pushing the limits in that as well. And whilst there are not many national benchmarks, that means that we’ve got a high percentage of usage here.

The challenge for us as educators and we’re not on our own in South Australia, is the appropriation which is then – how do you actually use – now I know how to use Excel, how do I use it to improve kids’ numeracy skills. How do I use technology, which is one of our biggest areas of funding, to improve students’ literacy skills? So, in a sense, I think we’ve been pretty successful. We’ve actually got people with a pretty reasonable level of competency in how do you use a word processor. Of course, what we’re asking for now is another level of skills. So in the developmental model, we’ve now moved to appropriation.

**Initiatives to achieve this last stage**

K: At the same stage, the innovation end of the cycle, which is about how the systems operate, and that’s partly why our training and development programmes within DETE actually focus on not just the training for teachers, but on the Discovery School model about how do you do the PD at the other end. In a sense as a Department, we focus on training and development from several models. We’ve made the decision that the development programme should be linked closest to the site and so we provided initially five million dollars in cash grants to schools. We then gave another five million dollars in grants where you could use it for training, or for purchase of products or whatever. That complements the existing funding that schools get for training and development.
K explained that schools could prioritise their own spending of these funds and that a large percentage of schools have indicated that the technology area is a prime focus area.

I: So the shift has been to situated PD where schools know their teachers and what they need most.

K agreed that there needed to be a change in existing PD and it had been helped by the release of teachers for thirty seven and a half days with ICT being the one that most teachers sought.

K: The change for us as a system is actually providing quality programmes, so while some schools have a very good local model, we’ve actually had a problem where in fact, sending people off to the courses is not a good model. In fact, in many a case we lose the focus on the mentoring collegial support side. So, we actually need to look at professional development and training much more strategically and not look at it as sending someone to a course that we know doesn’t work unless it’s in an integrated strategy. So, some schools for example, in their funding from the five million dollars training grants focused all of their training around six people, who then worked with people in the school. So we need to be much more creative, rather than just dividing up the time and money across our staff.

**Focus on Principals**

K said that this decision had been made because Principals were a critical element in the successful implementation of ICT. Based on the fact that they were users, planners and managers, a three-day training program was provided for all Principals. The Department considered that it was essential that this core group was “on-side” and confident with ICT.

**Discovery Schools**

K: We’ve established the Discovery Schools programme, which has currently three layers. There are six discovery schools whose role is to influence other schools, twenty discovery teachers every year, whose role is to work locally with the teachers, and three global discovery schools, which are based in the country and their role is
to influence others. We’ve provided release days for two people from every school in the state that we’ve covered the cost for to go and attend those programmes. The value of those is that they are not programmes that are run by some technology guru. They are actually being run by teachers in school who’ve actually just come probably from teaching a lesson and will go back to teach one after this.

In concluding his comments on this issue, K remarked that now the task was to go beyond integration. One of the strategies to be used was to ensure that teachers were more than “guides on the side” and so teachers have to have the skills level to train their own students. One idea was to explore the possibility of providing every teacher with a laptop and twenty four-hour Internet access.

I: This is the same point that H made in his interview about the situation in a large Independent school here in South Australia.

K pointed out that none of these initiatives would work without the commitment of the individual teachers. He ended the discussion on PD by making some very perceptive and critical comments about past models.

K: What used to happen – we use to have in the early days and the culture of many education departments, is the sheep dip model of training and development, everyone lined up and everyone went through it. And the model of that is actually... that is not the model any more. We’ve designed it for the individual but that’s actually more fraught because unless the individual has some commitment to it, then it’s not going to work.

I: I can only agree. Teachers need to go away feeling they have learnt or acquired something they can either use themselves or with their students.

K: And unfortunately people are a bit like victims. I mean in all systems we are a bit sort of, we still have a large percentage who have that, just give it to me. Because that’s the model, I don’t want to participate, just sit there, fill me up and I’ll go.

Is it a concern that so few ICT co-ordinators have a formal qualification?

I: Less than 5% of them do have a qualification. Does this disturb the Department?
K remarked that he had had a significant role as an IT co-ordinator and at the School of the Future, and he had no such qualification because what the Universities had offered in the past, he was not interested in.

I: I remarked that he could therefore be very interested in the model MEd I was proposing.

K then said he had also looked at all the MEd courses in Australia and like me was interested in the University of Southern Queensland model, which was attractive cost-wise, in its delivery and what it offered. He said he wasn’t surprised that 80-90% of my respondents were interested in an MEd if it offered them what they wanted and the delivery was flexible enough to suit their needs.

**Interviewee 4: Headmaster of a large Independent School (H)**

Interview with (H) whom I knew for many years before he left South Australia, and since he has returned. He agreed to this interview when I asked him after he had delivered a keynote address an ICT conference. Rather than give him a formal set of possible questions, I asked him if he would give me some insight into how he had been able to make his school one of the leaders in ICT in Australia. He talked about some of the successful initiatives he has implemented.

**The problem**

When H came to the school in 1996, it was already recognised as having one of the best Technology Centres in the world. There were more than 400 computers for less than 800 students. But the school had not tackled the issue of teachers being able to use them. H cited a figure of 80% of teachers who were not able to use them for simple tasks like word-processing or emails.

**Initiatives**

H began by discarding written Daily Notices to teachers and instead sent them to teachers as email messages. Teachers had to use the system to post or receive notices. To achieve this there had to be training sessions. The follow up applied to students who were all given an email address and encouraged to set up User Groups.
The second initiative was to remove computers from offices and give all teachers a laptop, which they could use 24 hours a day. To help teachers to be able to use them the equivalent of three salaries were put into training and development in order to help teachers to use the laptops. This not only included some “experts” but also general subject teachers.

The next initiative involved using the expertise of students. They created and run the school web-site. There were student-mentors who helped staff and students. The students had a special badge and received kudos for their efforts.

**How did this go down with the teachers?**

*H:* Initially it didn’t, but then again the kids’ teachers who have had them in their classes, you know, like T in Multimedia says, well I use D to do this anyway, because he’s just fantastic at it. So once it’s been legitimated by a group of people, but I think what we’ve got now is teachers who are past the stage of being afraid about switching a computer on, so they’re prepared to accept, they’re prepared to accept assistance. It’s powerful role modelling when kids can be teachers as well as learners, and I think it’s really very, very important.

**Can all teachers be “ICT Smart”?**

*H:* Well, I’ve also declared, right from the beginning of last year, that if you teach at this school, then you have to be technologically competent and I did a survey and I said, ‘This survey indicates what I mean by technologically competent.’

H then listed some of these bare necessities – email, word-processing, Web-access, simple trouble shooting. These skills are achieved through small workshops run by the ICT co-ordinators and subject teachers. He said they were aiming for 100% technical competency and students could help achieve this goal.

**The school’s PD model**

*I:* There is no formal structure like after school or at a staff meeting?

*H:* No, it’s all targeted to individuals and groups. Like, last Thursday night, new staff learnt how to use the Macs to record students’ marks, and old staff could go for a refresher if they wanted to.
H concluded this part of the interview by saying that by the end of the current semester 100% of the staff would be IT competent.

_H: I think a big thing was when I stood up at the beginning of last year and I said, ‘You will be, it’s not an option’, and then I instantly wiped out pencil and paper for daily notices._

His final comment was made as the bell rang at 3.30. He said that if he sent out a message now all staff would have read it by 4! The kids have taken to it like “ducks to water” and this has put pressure on the teachers to keep up.

_H: I’ve been up front about that. I’m always up front about that for staff. It’s not an option; it’s a requirement. For all staff here, it is a requirement. You will be technologically competent. We will provide the assistance. We will provide the support. We will all be competent._

### 6.3 Interview Model 2

**Procedure**

These interviews were with leading educators from overseas who were in South Australia to present Keynote addresses at Conferences. The method was less formal. Notes were taken, but there was only one recording and transcription. The interviewees were invited to talk about their perception of the need for PD, how teachers could be helped and what had been successful existing professional development models.

### 6.3.1 Interviewee 1: Canadian Elementary School Principal (Z)

The full transcript of this interview is in Appendix D.

_Z has been responsible for bringing about ‘whole school change’ in IT use and practice in his own school. He was willing to share his experiences and offer suggestions for overcoming the urgent need for PD, which this study has identified._

He started by presenting a scenario, very familiar to this researcher. Many teachers in Canada are now more than 50 years old and not only do they not have, or use a computer, they don’t see any reason to. He went on to discuss what he called
“personal hooks” i.e. ways in which the computer could help a teachers in their daily tasks.

Z: What are the hooks for me personally? Well, I use the computer as a working management vehicle, for record keeping, as a writing tool and as a lesson presentation tool.

He had a strong belief that after teachers have these “personal hooks”, which are mostly self-taught, they then realise how little they really do know.

Z: I had no computer training at all. I did it on my own. And once you get into it, you realise, Oh my God, I feel that it’s a sort of a pyramid where it begins to enlarge and all of a sudden you realise, Oh my God how do I know it all?

This analogy is similar to the one of the “tip of an iceberg”. Teachers have to progress from this initial stage and realise the potential of the software and hardware if they are going to be able to use them to help their students. Z agreed that this is still a problem for many teachers and it will remain until do acquire the needed IT skills and the knowledge to use them.

Z: To wind this part of the interview up it is essential that for teachers IT becomes part of their environment, part of their life, that is a concept of personalising.

At this stage XX, an IT Consultant from the Victorian Education Department joined the discussion.

Z: Welcome XX, we are looking at teachers’ personal use of computers so that they become a natural part of their everyday work. It this personal use of IT that has to be the starting point. You can then go onto the “public” use where they start to share and exchange ideas.

The discussion moved onto models of PD. They were both very critical of the one-day model run by an “expert” from another location.

Z: Those experts are valuable because they are there. It’s not like you can’t do the admin and presentation stuff. When you hit the “one shot”, you come back and you’re supposed to remember it all. And no one can do that. That one-off training – one blast and then…
We then talked about mentoring or coaching and the cascade model advocated by Collis. These were all models that work well on the local scene and then moved onto the system approach to PD. Z reported that in America many District Boards were requiring IT literacy for employment and even replacing teachers who didn’t have the skills. The other point was the vital role played by Principals in providing not only leadership by example, but also ongoing support.

To conclude the discussion XX gave some details of a successful Victorian example of teachers helping teachers.

XX: *One of the approaches that we’re keen to develop is the lateral transfer of innovative teaching us an on-line interactive sharing of “road tested” ideas. It can include resources, hints about software on a particular topic a teacher is interested in or needs to know about.*

It was interesting that this approach of using IT to deliver not just PD in IT, but curriculum PD, is the same approach as espoused by Subject X in her report of the TSOF in South Australia.

XX: *Rather than saying IT is another thing that you have to add to your personal agenda, it’s saying, here is a way of covering the number one agenda items which are standards and curriculum*

Z finished the discussion by giving us the contact details of a colleague in Alberta, which is considered to be the leading province in Canada in the field of IT in education.

6.3.2 Interviewee 2: Senior University Academic (C)

I have been familiar with the work of Subject C for nearly 20 years. I have been closely involved with her for more than a decade through my involvement with the Australian Council for Computers in Education and its national and international conferences. Because of this association, C accepted my invitation to come to Australia to present the Keynote address at a national conference.

Knowing of my research and my work in PD she was very happy to agree to this informal interview. There were no set questions but we talked about successful PD models.
Is there a need for PD?

C began by introducing the concept of the synergy that has to exist between IT and teacher instruction (TI). ‘You can’t have one without the other’. Even though she was speaking of the situation in a University, her ideas are applicable to schools and other educational settings.

Because there will be resistance to, and even fear of change, she suggested that you should start by ‘thinking big but starting small’. Like H she cited the example of the use of email. It began as an innovation and now has become a part of mainstream activity. C went on to outline ways in which she had been able to extend best practice in IT to the majority of her students and staff.

C gave examples of three metaphors she uses to describe the change process. She spoke about pioneers or trail-blazers who became settlers and they bloomed like thousands of flowers.

She saw systemic change as being like a jigsaw where you have all of the pieces, except for a while there are some missing ones. You have to shuffle the pieces around until you have the whole picture.

The actual process she pictured as filling a champagne glass – you are eagerly awaiting it – there is the excitement as the wine is poured in and bubbles – but you have to be patient or you will spill the wine, and careful because the glass is fragile.

The change agent in all this has to be a visionary, who has to operate in the mainstream and be a regular “trouble shooter and fixer”.

Successful models for PD

Rather than give details of models C spoke of approaches that had worked in her situation. She was adamant that IT could and should be used in the delivery of PD in IT i.e. the concept of the synergy between IT and TI. She considered IT was not a “soft” or expedient option but an essential one for the delivery and support of the training. To her tele-learning was not the same as distance education because her students had twenty four-hour access and support. She was insistent that such a delivery method is not a “cop-out” or an inferior model. In her situation it also
provided equity of access to all students and was much more effective than the traditional one-hour lecture.

We concluded the interview by considering ways in which her approach could be used here for delivery of PD and the proposed MEd.

**Suggestions**

IT has to be used, particularly for remote students. Students must have input into the courses and their evaluation and modification. They must have the expertise and access to benefit from such an approach.

At the workshop level you have to start from where teachers are and where they need and want to go. The courses must be situated, ongoing and supportive rather than threatening. There has to be a leader, a visionary, and a shared belief in the role that IT can and must play.

### 6.4 Interview Model 3

**Procedure**

Rather than use a traditional interview technique the researcher used a modified version of the Delphi technique developed by DelBecq in 1975. In this approach the researcher decided to utilise the expertise and experiences of the teachers who had responded to his survey.

The group to be interviewed comprised the ten respondents to the survey, who indicated they would definitely be interested in undertaking the proposed MEd program, the framework for which, is the final product of this study. They were contacted personally by an initial telephone call and invited to participate in this stage of the study.

The eight that agreed to participate were sent the survey information package. This contained a plain language statement and the results from: Question 6 ‘Which mode of delivery?’; Question 7 ‘Ranking the units’ and Question 8 ‘Other units which could be included’. Each member of the group was asked to independently comment.
on the findings and to include any other observations or comments considered relevant.

The responses from each individual were collected and passed on, in an unedited and non-attributed form, to all members of the group. A second cycle then took place, which in some cases involved individuals commenting on others’ responses and/or revising their own contributions in light of what others had said. The process continued until there was a resolution, or consensus, or ranking, of the rationale for such a course, along with the recommended units and the overall structure and mode(s) of delivery.

The purpose of these interviews was to provide ideas for a framework for the proposed Masters level program. A modified Delphi technique was used to develop what Willis (1991, p. 344) identified as a core of concepts, principles and procedures’ that he felt should be in most educational computing graduate programs. The group who was interviewed consisted of those teachers who had indicated they were definitely interested in undertaking a coursework Masters.

6.5 Summary of the main issues raised

The need for professional development

H: ‘I believe that many of our current staff members need assistance in their learning from people that they are able to trust and confide in, just as students do.’

X: ‘It is hard to keep up with changes in computing technology especially in the area of software development. It just happens through the goodwill of staff currently and their thirst for knowledge’.

Comments on existing professional development models

Probably one respondent from the country in this exasperated comment encapsulated the most common criticism of existing professional development models. He had made a comment to his Principal that he was frustrated by the BITZA approach in providing professional development in IT.

’We do a bit of this
Then a bit of that!’
And before you get around to applying the newfound knowledge you forget which part goes with which. There has to be a better way.'

This of course was the same criticism the researcher made of the approach used in the professional development project ‘Making IT Work for All’ which is described in Elective Research Task 2.

From remote regions it is very costly and time consuming to send teachers to even a regional centre for training. ‘These costs would be much less if we could access training locally.’

‘In remote areas of South Australia training for staff in any use of computers is all but impossible to access.’

Even if it is available teachers have to travel long distances and they have to be “covered”: this is often a problem due to a limited budget or lack of available TRT teachers.

Increasing workloads and demands on teachers’ time, have dampened the enthusiasm for after school or evening workshops.

Solutions

‘I really believe that the trust factor is so huge that one staff member working with his or her peers is so much more valuable than the alternatives in this case. I think that through even more intensive training I would be in a greater position to assist other teachers on my staff.’

This respondent went on to outline a proposal for an intensive minimum block of training time where he “work shadowed” an expert colleague; in this case it was some-one from the School of the Future at the Levels here in South Australia.

Comments on a Coursework Masters program

Target group

The program should be open to all teachers and not just IT co-ordinators.

There should be a strand for non-classroom teachers.
Teachers who are already involved in IT and interested in pursuing it as a career path.

**Why would they want to take it?**
Will the knowledge and wisdom gained help enhance the teaching and learning environment in my classroom and those of my colleagues?

Will it help me develop a computer orientated classroom where my students are active learners able to adapt programs for their own benefit rather than being limited to simple word processing and copying slabs of information from various encyclopaedia programs?

As a classroom teacher how will it help me bring about change at the school level?

**What reservations would they have?**
How will it cater for the needs of country teachers?

What incentive is there? Why should teachers whose average age is now over 40, want to undertake any such course?

It costs money and they have family and other commitments. Before fees were introduced many teachers, this researcher included, undertook part time study to upgrade qualifications and or improve skills and knowledge.

Why should they do what their employer should provide for them? If the Education Department expects all teachers to have appropriate IT skills, then it is their job to provide the opportunities.

**Positive outcomes**

Even though many of the teachers who undertake an MEd are already IT co-ordinators or in leadership positions,

‘An MEd would give them a greater in-depth understanding and knowledge of issues and would be a practical extension of what they are already doing.'
Graduates would have the qualifications and standing to be in a better position to carry out action research to see how effective new units and programs have been.

They would be in a better position to bring about change not only at the school level but also at a regional level.

**Content**

Several respondents, who, like the researcher, in the past took courses, pointed out how irrelevant and obsolete they were. The MEd program proposed here would be structured so that it did meet the needs of its clients and that its content was kept current.

There is a place for action research for some teachers, but for many there is a more practical need. There needs to be units, which look closely at available programs and develop ideas on how they can be used ‘to their maximum capabilities in the classroom’.

Particularly for teachers in remote regions there is a place for a technical unit.

‘I feel that people in my position need more knowledge about what goes on in the computer box. In remote settings or even close country settings where there are no experts in the town this is a real need.’

A city respondent reported on the benefits of a unit dealing with hardware basics.

‘One particular course involved a hands on approach, stripping and re-assembling a computer, doing upgrades and learning about how the parts worked together. I found this really interesting as a background to diagnosing problems and maintaining a system.’

Another city respondent raised the issue of the basic theoretical underpinning of the use of IT in stating that teachers need ‘to gain a better understanding of how the scope and nature of student learning is changed using IT.’

This led to these questions which need to be resolved.
'What are the implications for this on methodology? How should educators change the ‘what and how’ of the curriculum to accommodate the change in student interaction, particularly in the area of communication?’

‘What are the implications?’

**Structure**

Most of the respondents felt there had to be recognition of their prior learning and experience. They favoured a model, which consisted of 50% structured units, including a Research Methods unit and a thesis or major project. This second part could either have focus on a research investigation, a case study or an action research project.

**Delivery**

Because of the problems with delivery of practical units a country respondent suggested the idea of an intensive ‘live in course’. The least favoured mode was on campus and from past experience there were reservations about traditional external studies. Most of them would select an electronic delivery mode if it were available.

### 6.6 Summary of the findings

**Interview Model 1 and 2**

The more than a hundred and twenty pages of transcripts from the interviews were analysed using the qualitative software NUD*IST which had been used to analyse the written responses to Question 12 in Chapter 5.

The nodes identified gave a precise and accurate picture of the most common and important issues. The first nodes related to the questions and so have not been repeated here. The following list represents the siblings of these nodes, which had the most frequent references: the urgent need for PD, the age factor, competency standards, models, initiatives, qualifications, role of Principals.
Each of the interviews is briefly examined by referring to specific comments by the interviewees, who are coded as R1, R2, R3, R4, R5 and R6.

*Need for PD: R1, R2, R3, R4, R5 and R6*

All agreed that there was an urgent need and cited different figures. R6 said that initially 80% were lacking some essential skills. R1 cited 60%. R3 questioned the validity of some current figures because what was the basis for the judgement.

*The age factor: R1, R3, R4 and R5*

R1: pre-computer aged teachers R3: average age nearly 50 R4: age 40+ a problem R5: ageing teachers

*Competency standards: R1, R2, R3, R4, R5 and R6*

R1: How to measure it R2: critical of term ICT Smart R3: difficult to define and measure R4: Require teachers use email Daily Notices R5 personal hooks – all his staff had to be.

*PD Models R1, R2, R3, R4, R5 and R6*

R1: informal not formal, hub-groups, modelling, system wide advisory R2: variety, collegial, mentoring R3: School-based rather than system, old way like a “sheep dip”, mentoring R4: small to meet individual needs, student mentors R5: critical of the “one-off” model, need for variety to meet personal needs R6: start small and think big, cascade model

*Initiatives: R1, R2, R3, R4, R5 and R6*

R1: Discovery Schools, Technology School of the Future, on-line delivery R2: Discovery Schools, funding for Learning Technologies projects. R3: funding to schools, 37+ hours PD, support for Conferences R4: All teachers have a laptop, all teachers to be ICT Smart. Students run the school Web-site and have own email addresses R5: Whole school ICT-orientated, encourage visitors R6: All students on-line 24 hours for delivery of courses.
Qualifications: R1, R2 and R3

R1: surprised at interest in MEd, critical of courses R2: Didn’t see lack of as being a problem. Surprise at interest and suggested it could be a part of PD linked to Grad Cert R3: Questioned need for formal qualifications, most teachers self-taught, but interested in an on-line MEd.

Role of Principals: R1, R2, R3, R4, R5 and R6

R1: felt their role was vital, we go through them and provide PD. R2: said the Principal has to be “on-board”, she gave details of a program designed for Principals and Deputies. R3: they are the critical element in the successful implementation of ICT, he had approved a 3-day training program for them so that they were “on-side”. R4: Principals must lead by example, encourage and support but insist that teachers follow suit. R5: the Principal is the leader, others follow. He did what he expected, or required, his teachers to do. R6: The leader is the prime change-agent, they have to be the visionaries or trail-blazers.

Interview Model 3

Because of the relatively small numbers of respondents (N=8), the data collected were much less than from the other interview models. In total there were just over twenty pages of transcripts. In addition there were the original written responses Question 12 from the state-wide-survey, which is discussed in Chapter 5. Because respondents had been given the same set of issues to comment on, it was felt that data could be analysed effectively without using NUD*IST.

All the respondents felt there was an urgent need for PD, particularly in the more remote regions. They were critical of existing models, like the “bitza” approach. They were concerned about the pressure on teachers to put in extra hours after schools and the cost and time involved in travelling to other centres. They felt the Education Department had to address their concerns.

They supported the “in-house” model delivered by colleagues who were known and respected and knew what the other needed and wanted and they would be there the next week. Like the respondents in the other models they believed strongly in the role of mentoring and the example set by the Principal.
They were all definitely interested in an MEd but expressed a range of concerns. Will it really help us to help others? Will it be of any use or just like other University courses we have taken? What are the incentives for us and who will pay?

But they felt that if the course was designed to provide what they wanted it could give them the extra knowledge, expertise and theoretical basis to bring about desired changes and improvements. It would give them a sense of authority to go with the responsibility they had as ICT co-ordinators.

They were interested in a model, which gave recognition for their prior learning and experience. It had to have a practical focus but supported by theory. The actual structure sought was a 50% to be units, one of which should be an optional technical one, and 50% to be a major project, which could be a Case Study, Action Research or Review of Literature.

The delivery mode most preferred was electronic because none of them wanted to go anywhere near a University. A mixed mode was possible with some time on campus as a “live-in” residential.

6.7 Concluding comments

This data provided a very “rich” source of relevant data on issues relating to teacher professional development in ICT. Their frank and expansive comments may have been in part due to the fact that I was well known to the interviewees, personally and professionally, but more importantly because of their expertise and experience in the area.

It was reassuring to find that many of the concerns and issues identified in other stages of the overall research were mirrored by these educational leaders from Australia and overseas. It was also interesting to observe how closely they related to the conclusions reached by an International Working Party at WCCE 2001. These findings are discussed in detail in Elective Research Study 2.

The analysis of this essentially qualitative data provided substantiation for the findings of the analysis of the quantitative data in Chapter 5. It also provides a rationale for the research on MEd programs, which is discussed in Chapters 7 and 9.
The material presented in this chapter is in keeping with suggestion by Schratz and Walker (1995, p. 16). They said that such material ‘rather than just presenting a theory and then giving illustrative examples, should provide accounts of perception in action and then develop a platform from which to develop further ideas.’

Most of the respondents felt there had to be recognition of their prior learning and experience. They favoured a model, which consisted of 50% structured units, including a Research Methods unit and a thesis or major project. This second part could either have focus on a research investigation, a case study or an action research project.
Chapter 7

Results of survey of existing Masters level courses

7.1 Overview

This chapter outlines and discusses the findings from a survey of all Faculties of Education in Australia in April–May 1999. The chapter begins with a brief comment on the aims of the survey. It then outlines how the data were collected, organised and then analysed. This analysis of results became the basis for the construction of a framework for the coursework Masters level program, which is the end product of this whole investigation. The chapter ends with a concluding discussion.

7.2 Aims of the survey

The first purpose of this survey was to establish if Australia was following trends in Canada and the United States, outlined by Ekhaml (1985), Collis (1986) and Willis (1991), from the mid 1980s to provide more graduate level programs in educational uses of computers.

The second, and more significant, purpose was to obtain details of Masters level programs which were currently being offered in Australia and overseas.

Graduate programs continue to respond to and support the demands and needs of the marketplace, especially in the area of computer programming, utilisation and application. Colleges and departments of education are responding to the need for a computer component as part of the education of teachers at both the undergraduate and graduate levels. (Ekhaml, 1985, p. 98)

This study by Ekmal enabled a detailed picture to be obtained of graduate degree programs offered in the computers in education in the United States. Ekhaml found that there were 41 institutions, which offered graduate programs in educational computing. By 1989 the figure had increased to 82. Willis (1991, p. 333) claimed that by 1990 there were probably more than 150 such programs. If this trend continued by 1999 there perhaps could have been hundreds of programs to consider in America alone.
No such picture appeared to be available in Australia. A search of *The 1998 Directory of Australian Postgraduate Courses* did identify which institutions did offer such programs but only gave brief details. The original intention had been to conduct a comparative analysis of courses offered in Australia and the United States of America and Canada. In consultation with his principal supervisor the decision was made to limit the survey to courses offered in Australia. The reasons for this were twofold.

The first was a practical one. The search of *The 1998 Directory of Australian Postgraduate Courses* revealed that of the 81 institutions, only 17 appeared to offer a specialisation in some aspect of educational computing at the Masters level. By restricting the survey to Australia it was obviously a relatively easy task to obtain details of all programs. As well it was possible to visit many of the institutions which offered Masters level courses. The second was an academic one. Details were obtained of several programs from Great Britain, Canada and the United States. When they were examined closely they were either at a Graduate level and not at what could be considered a Masters level by Australian standards, or they did not relate closely enough to classroom uses.

### 7.3 Method

More than a decade ago Collis conducted a survey of all Faculties of Education in Canada. She found (1986, p. 67) that only five of nearly 50 institutions offered such programs. In this investigation the first step was to identify all Faculties of Education in Australia, which offered coursework Masters level programs in Information Technology for R-7 classroom teachers. Initially the data sought appeared to be available from publications such as *The Directory of Australian Postgraduate Courses*. However, examination of publications like this only gave an outline and very brief details.

A preliminary search of University Handbooks in the Deakin and Adelaide University libraries proved to be ineffective because it would have meant identifying all Faculties of Education and then examining their handbooks to see if in fact they did offer such a program. It was possible that not all programs would be identified.
The procedure used followed that used by Ekhaml (1985) in her study of institutions in the United States and Collis (1988) in her survey of all Higher Education institutions in Canada. A survey in the form of a questionnaire was conducted in which the Deans of every Faculty or Department of Education in Australian universities were contacted by email. They were sent a slightly modified version of the information package that was sent to potential respondents to his 1998 South Australia-wide survey (See Appendix C). They were asked if they would be prepared to participate in this investigation by firstly confirming that they either did or did not offer such a program. If they did offer a program they were asked to supply contact details for the co-ordinator.

Within three weeks replies had been received from 72 of the 81 Deans. The responses indicated that 21 programs were currently offered. All of these co-ordinators were contacted personally to clarify specific questions re the nature and delivery of these programs. This process reduced the number of programs to 15. In most cases, details of the programs were obtained electronically by accessing Web sites. In other case it was an easy process to find details from handbooks now that the universities had been identified.

In late 1998 and early 1999 the researcher visited as many (ten) of these sites as possible. This enabled him to obtain, not only details of the scope and breadth and depth of current programs offered elsewhere, but as well to discover what software and hardware by being used. He was also able to collect informal data from discussions with co-ordinators and in several cases, students.

A register of all programs was then produced. Because there were only fifteen programs it was not feasible to make a selection of the leading programs and sites, taking into account the academic standing of the individuals and institutions, so that the study could focused on the outstanding programs which were already being offered.

In the content analysis of these courses, the following questions were considered:

- How could they be described in terms of purpose and intended students and outcomes?
- Was there any consensus regarding content and sequence and delivery mode?
The researcher was curious to see if the findings were the same as those of Willis in 1991.

Existing graduate programs differ considerably in almost every way. In all areas a survey of educational graduate computing programs finds few, if any, common elements. (Willis, p. 334)

After discussing the six most common models he concluded that educational computing had to have a “home of its own” and nor merely be a “sub-field” within educational technology.

### 7.4 Summary of results from the survey

The survey results showed that many of the programs with this specialisation have only been offered in recent years. In several cases the institutions had offered a Graduate Diploma which was now replaced by a Masters program. Although, as Willis (1991) found, there was no consensus with respect to content, structure or delivery mode, there were common features which could be applied to the proposed framework in this investigation.

**Students**

The students were mainly IT co-ordinators, or teachers who desired to take up this role, rather than classroom teachers who wished to increase their own expertise.

**The course structure**

The most common structure consisted of eight coursework units but in three cases there was the opportunity for coursework units plus one or two research paper or investigation options. A second model consisted of core, specialisation and elective units. A third model had a compulsory Introduction to Research Methods unit, three specialisation units and two elective units. A fourth model, offered by two institutions, had a 50:50 balance between coursework units and a major project.

This was the model closest to that desired by the ICT co-ordinator-respondents in this current investigation.
The course content
Apart from Introduction to Research Methods there was little consensus on titles for units. In most programs there were units relating to IT and learning and classroom integration and an independent study unit.

The course delivery
More than 90% of programs were normally offered in an off-campus and part-time mode. More than 30% could be accessed electronically.

Recognition of prior learning
In only two programs was there recognition of prior learning, but there was general acceptance of advanced standing due to earlier qualifications.

Articulation
In most cases programs built on existing graduate certificates or diplomas and in more than half articulated to a Doctor of Education.

Benefits to graduates
The most common stated outcomes were that graduates would:

- Have engaged in further PD through higher degree study
- Possess an understanding of contemporary theories and issues
- Have been able to pursue a specialisation in their own field
- Be able to translate into practice what they had learnt from the program
- Have enhanced their professional knowledge and skills
- Provide the education profession, and the wider community, with leaders capable of addressing critical issues in educational practice
- Be engaged directly in improving classroom and school practice in IT.

From this survey of existing programs the researcher was able to carry out a reductive process to find what the programs had in common and identified
underlying principles. Finally he was then able to produce a framework for a coursework Masters program in classroom uses of Information Technology to be offered to R-7 teachers and using a variety of delivery modes.

7.5 Program framework

This section begins by discussing some of the key principles, which have to be considered in the construction of the framework or this proposed course-work Masters level program in classroom uses of IT. Data obtained from all of the collection strategies described in Chapters 4–7 were used in this exercise.

7.5.1 Underlying principles

Willis (1990) began his discussion of what he considered a graduate program in educational computing should look like, by defining such programs.

Graduate programs in educational computing are defined as programs that prepare students for roles such as computer co-ordinators. (Willis, p. 340)

He concluded his discussion of the possible makeup of such programs with comments that have direct application for the proposed framework, which is the end product of this study.

Graduate programs with a heavy technical focus may prepare students for today’s educational computing environment. However, they may be short-changing students when it comes to preparing them for tomorrow’s educational computing environment. (Willis, p. 340)

In such programs there should no longer be a heavy emphasis on technical or equipment issues because of their rapidly changing nature.

Only too well this researcher remembers the hundreds of hours he spent in his own Graduate Diploma on programming. Subsequently he did not use this knowledge when he worked with classroom teachers who were interested in enhancing the teaching and learning environment in their classrooms.
7.5.2 Basic core

Willis (1991, p.344) felt that there should be an important core of concepts, principles and procedures that should be in most graduate educational programs. He identified seven that he called ‘knowledge bases’.

His concluded that these knowledge bases that relate to organizational change and technology diffusion are more relevant because they help to provide a broader perspective than software or hardware specific courses.

All of these are briefly discussed here and compared with those that have been compiled from the survey of existing programs in Australia and from the modified Delphi technique used with the group of subjects from his state-wide survey, who said they were definitely interested in pursuing a course work Masters program.

Theories and models of instructional design

Such a unit would provide students with a ‘conceptual framework for both the development and use of instructional materials’. (Willis 1990, p. 344) He cited hyper-media as one of the strategies that should be covered.

Principles of curriculum development

The individual materials produced need to be a part of the wider context, the curriculum.

Methods of technology diffusion, organizational change and consultation

Many graduates of educational computing graduate programs spend more time and effort trying to change the behaviour of organisations and individuals than they do in front of a computer (Willis 1990, p. 344).

A research and professional knowledge base

‘Students should understand this knowledge base and they should graduate with the ability to locate and interpret new knowledge as it is added to the base.’ (Willis 1990, p. 344)
Hardware specific and software specific user skills

Willis, like this researcher, felt it was not wise to eliminate all such units. The focus should be on hardware and software that was likely to be used in the future.

Professional teaching and training skills

Because these graduates will be working with adults they need to have the appropriate theoretical background as well as the practical skills.

The social implications of technology

The researcher considers this unit to be vital. Of all the units he has delivered, this has been in many ways the most engrossing, exciting and stimulating. Willis gave these reasons for including such a unit.

> The use of technology impacts on society in many different ways. Students should be aware of and able to discuss varying viewpoints on such topics as access to technology by different groups, privacy and confidentiality issues, computer-related ethics and the impact of technology (direct and indirect, immediate and long term) on society. (Willis 1990, p. 345)

7.5.3 Implications for this proposed framework

In the conclusion to his article Willis made several comments, which apply just as well to this proposed framework a decade later.

> Knowledge bases that relate to organisational change and technology diffusion are more relevant to the jobs of many graduates and have a longer “shelf life” than the content of a course on PageMaker. Instead of teaching PageMaker, we might teach a course on the design of desk-top publications and or presentations. (Willis 1990, p. 346)

Such units should focus on principles and applications. Hence the suggestion for a unit, Computer Generated Teaching and Learning Materials, which would involve the use of a range of software and hardware to produce materials to enhance the teaching and learning environment in the individual’s classroom.

Some Faculties of Education may lack the expertise and equipment to develop and deliver such units. An approach similar to that advocated by Willis and used successfully by the researcher at the Northern Territory University could be used.
Lecturers from other faculties could teach students, using facilities and resources available in those areas.

### 7.6 The framework for the proposed program

The program will be designed to provide its students with what they want, when they want it and how they want it. The program will be designed to provide its graduates with many of the outcomes listed in Section 7.4.

It will be 50:50 coursework units and major project. The four course-work units will include an optional Research Methods unit for students who did not have an appropriate background.

The other coursework units will be options from this list. Students can apply for recognition of prior learning for formal PD activities they have undertaken or delivered or projects they have carried out such as setting up a computer room or producing units of work for other teachers.

- ICT and learning
- Integrating ICT into the classroom
- Resource management
- Contemporary issues
- ICT and society
- Independent study

This last unit was one used often by this researcher at the Northern Territory University. It enabled students, after negotiation, to pursue study or research in specific areas of interest. Then there is a major project, which could be an action research project, a detailed literature review, a case study or a submission.

The program will be normally be a two-year part-time one, offered using a variety of delivery modes with the most common one being an electronic one.
7.7 Concluding comments

From this survey of existing programs the researcher was able to carry out a reductive process to find what they programs had in common and identified underlying principles. Finally he was then able to produce a framework for a coursework Masters program in classroom uses of Information Technology to be offered to R-7 teachers and using a variety of delivery modes.

The proposed framework for a coursework Masters level program reflects several different data inputs. There were program details obtained from overseas universities his chapter, the results of the South Australia wide survey described in Chapter 5 and the interviews described in Chapter 6. When this data was combined with the comparative analysis of existing programs in Australia, it was possible to produce a framework which was based on other successful models but which addressed the interests and concerns of those potential students, the ICT co-ordinators who were the respondents to his earlier survey.
Chapter 8

Discussion of overall findings

8.1 Overview

This chapter is designed to provide an interpretation of the analysis and discussion of the findings from the research described in Chapters 4, 5, 6 and 7. It will establish if the data has supported or disproved the underlying contentions and test the hypotheses that underpin the whole investigation.

8.2 Underlying contentions and hypotheses

This investigation tests two hypotheses relating to the professional development needs of DECS R-7 teachers in South Australia. To assist in this process the researcher formulated four underlying contentions, from his state-wide experiences in talking with teachers, observing what was going in schools and in providing professional development. He considered they would have a direct bearing on the research to be carried out because the research questions were developed from them.

The contentions

- ICT has already had a significant impact on education and teachers’ professional lives.
- All DECS teachers will be required to be “ICT Smart”.
- At the time of this investigation not all of these teachers have the necessary knowledge and skills to achieve this goal.
- Those teachers will need assistance in the form of professional development.

These contentions, which were tested during the investigation, are now discussed in turn and a decision made as to whether they were supported or disproved.

8.2.1 ICT has already had a significant impact on education and teachers’ professional lives.
The analysis of the literature in Chapter 4 revealed that in the past two decades, ICT has come to play a much more significant role on the teaching and learning environments in schools. A decade ago in DECS R-7 schools there was one computer for every twenty-five students. The computers were usually located in a Computing Room and students went there once a week to “do computing” with the only teacher who knew a little about computing. The average classroom teacher was not required to be involved. Now there is one computer for every five students and the computers are either in the room or in a “pod” nearby. This dramatic increase in the number of computers has impacted on teachers’ professional lives because all teachers are expected to be able to use them to enhance the teaching and learning environments in their classrooms.

As well analysis of data from the findings of the interviews in Chapter 6 and from the conclusions reached at the end of the discussion in Elective Research Study 2 of the findings of Working Party 3.5, reinforce the fact that there has been a dramatic change in the pedagogical approach to teaching. There has been a shift from an emphasis on transactional learning to transformational learning. Learning has shifted from being teacher controlled and directed to being student centred and focused. The teacher’s role has changed from being almost the sole provider to that of a facilitator.

From the results of the analyses discussed in this section, this contention that ICT has already had a significant impact on education and teachers’ professional lives, would appear to be supported.

8.2.2 *All DECS teachers will be required to be “ICT Smart”.*

In 1997 the then Minister of Education in South Australia announced in the press that by 2001 all teachers in state schools in South Australia would be required to be using information and communication technology (ICT) to teach a significant part of their lessons (Lucas 1997, p. 4). Using contemporary jargon, this meant that teachers would be required to be “ICT Smart”.

The analysis of the literature in Chapter 4 and the findings from the analysis of the interviews in Chapter 6 revealed that this really means that they will be expected to be able to use ICT where appropriate to enhance the teaching and learning environment in their classrooms.
The data collected in the interviews described in Chapter 6 (6.2.1–6.2.4) give a clear idea of what the term “ICT Smart” actually means. Interviewee Y said that it was a politically coined term, which actually referred to whether teachers had been able to successfully embed ICT in to their everyday professional activity. Interviewee K pointed out the difficulty of quantifying what the term meant and questioned how certification could be achieved. He cited examples of specific and types of software and hardware teachers should be able to use and examples of ways in which they should be able to use them in the classroom. Interviewee H from an independent school, said that the school already required all teachers to be “ICT competent”. He told his staff ‘You will be, it’s not an option’. He started by supplying every teacher with a laptop and replacing written daily notices with email messages. Interviewee H said it was essential for teachers that IT becomes part of their environment, part of their life, that is a concept of “personal hooks” i.e. ways in which the computer could help a teachers in their daily tasks.

From the results of the analyses discussed in this section, this conception would appear to be supported.

8.2.3 **At present not all of these teachers do have the necessary knowledge and skills to achieve this goal.**

Findings from the 1998 state-wide survey described in Chapter 5 revealed that nearly 40% of the teachers surveyed could only be considered to be “novice” or “below” average users of ICT. The conclusions reached after the two 1998 state-wide professional development projects described in Elective Research Study 1, cited figures of over 30% of teachers surveyed as being below average users. Interviews from 1999 described in Chapter 6 also indicated that not all teachers had reached this standard and cited figures between 20% and 30%. By 2001 in the report from Working Party 3.5 from WCCE 2001 in Elective Research Study 2, the cited figure had fallen to 20%.

This principal of a remote school said that many of her staff still needed help, which was not available because of their isolation. (Jackson, L. 2001, pers. comm., 24 August). A follow up survey now would establish what is the current picture. There are several factors, which could explain why there appears to be between 20% and 25% of teachers who do not have these expected skills. Jackson suggests that is a
distance factor. This was certainly the case in 1998 when there were almost 20% more country teachers who were classified as being novice or entry level than their city colleagues.

A second factor could be that the problem of an ageing teaching profession is becoming more acute, particularly in the ICT area. Three interviewees in Chapter 6 also considered the fact that the average age of teachers was over 50 and hence these teachers were close to retiring or accepting a “package”. They felt like Bateup (1996) in his cartoon shown in Part A, which describes a teacher as ‘an obsolete relic of a bygone age’.

This theory of obsolescence was promoted by Johnes (1993, p.10) who in discussing what he called “human capital” spoke of a worker’s knowledge becoming ‘obsolete’ and that in ‘order to compensate the worker must devote additional time to training’. From the results of the analyses discussed in this section, this conception would appear to be supported.

8.2.4 Those teachers will need assistance in the form of professional development.

All teachers are expected to be able to make appropriate use of ICT but it was identified in Chapter 5 and in the findings from the interviews in Chapter 6 that many teachers (nearly 40%) were not “ICT Smart”. It was clear that they did need help in the form of on-going professional development. The same conclusions were reached at the end of the discussion in Elective Research Study 2 of the findings of Working Party 3.5.

These teachers do not have the necessary skills and are only at the entry or adopting level of usage of ICT for several reasons. It may because they are in the age bracket of teachers who were trained before ICT had such an impact on faculties of Education. It may be because they are located in a remote region with limited access to professional development. The school may still be organised so that children go a computer room with another teacher. As well as Ragsdale (1991, p. 161) pointed out there may be a problem of not having the right ‘mindset’. They may be experienced capable teachers who feel they don’t need to use ICT or like many of the respondents
to the survey in Chapter 5, they have had unsatisfactory past experiences at professional development activities.

From the results of the analyses discussed in this section, the conception that there are still teachers who need assistance in the form of professional development would appear to be supported.

The hypotheses

These hypotheses, which were tested during the investigation, are now discussed in turn and a decision made as to whether they were supported or disproved

- There is an urgent need for professional development, particularly in country regions.

- Existing strategies used to provide this assistance need to be replaced by more effective ones.

These hypotheses, which were tested during the investigation, are now discussed in turn and a decision made as to whether they were supported or disproved.

8.2.5 There is an urgent need for professional development, particularly in country regions.

The discussion on contentions one to four (8.2.1–8.2.4) addresses this hypothesis. Analysis of the quantitative data collected from the survey described in Chapter 5, revealed that nearly 40% of the teachers surveyed could only be considered to be “novice” or “below” average users of ICT. On closer examination using a cross-tabulation technique, the relative figures for country and city teachers were 48% and 32%. If these results were to apply to the whole population then the situation in the country regions becomes even more serious.

As a result of the analysis of the findings, which clearly identify the fact that so many teachers, particularly those in country regions, need assistance, this hypothesis is supported.

8.2.6 Existing strategies used to provide this assistance need to be replaced by more effective ones.

Teachers are expected by now (2001) to be “ICT Smart” as discussed in contention two, (8.2.2). Results of the qualitative analysis of data in Chapter 5, the interviews in
Chapter 6 and the findings from the conclusions of Elective Research Study 2, clearly show that there is general discontent with existing models. There was particular criticism, from interviewees and respondents to the “one-off“ model, which was referred to as the “sheep-dip” or ‘the travelling road-show” approach. Other criticisms related to distances to be travelled, inappropriate materials and delivery for adult learners, lack of follow up and the fact that teachers often had to pay for what DECS should have provided if they expected teachers to be “ICT Smart”.

The interviews in Chapter 6 (6.2.1 – 6.2.4) identified a range of strategies adopted by DECS which should prove to be more effective. The TSOF has set up a web-site, which provides on-line access to training, resource materials and teaching ideas. A network of Global and Discovery Schools cover the whole state. Teachers in these schools provide collegiate professional development to teachers in their own and neighbouring schools.

Another very interesting strategy was a project, which focused on principals and other school leaders. Intensive workshops and training sessions and a series of ‘master classes’ conducted by national and overseas experts have helped prepare these teachers to be the leaders of change in their schools.

A final strategy was of particular interest to this researcher. It involved a two-year longitudinal collaborative research project with University of South Australia on the Discovery Schools network and how effective they were in bringing about improved learning outcomes.

In response to the repeated criticism, including his own, of existing models, the researcher investigated the literature and his experiences and others, with the intention of being able to establish a set of principles which have to be considered in the delivery of professional development to adults. To provide ideas for a more effective model the researcher revisited the literature on providing training for adults and his first experiences in working with adults as a lecturer at the Northern Territory University.
Principles underlying successful PD

When he became a university lecturer after more than 25 years as a high school teacher, this researcher’s first lectures and workshops with adult learners, experienced teachers, were to put it bluntly, a disaster, which almost led to a walkout. One of the graduate students was himself an Adult Education lecturer. Over a beer or two in the staff bar, he suggested the researcher should read some of the work by Knowles. For the first time the researcher realised why his approach had not been successful. Subsequently he has always tried to follow the principles Knowles espouses for working with adult learners.

The researcher began by considering what were the basic premises underlying successful PD activities he had either attended or he had conducted.

- They must start from what the participants are to gain. They must go away feeling they have not only learnt something but they have ideas they can share and use immediately
- More experienced participants should feel that they could replicate the activities with their colleagues
- I hear and I forget. I see and I remember. I do and I know
- Learning should be “hard fun”
- Participants should feel they were engaged, excited, enriched and empowered.

Theoretical underpinnings

Knowles (1970) wrote of the distinction between pedagogy and what he called andragogy. He defined andragogy as the science of helping adults learn. He went on to say (1970 p. 38) that ‘Education is no longer a process of transmitting what is known. It is now a lifelong process of discovering what is not known.’ He concluded with a series of stages individuals pass through as they mature. They move from dependency to self-directed learning and in doing so accumulate experience which is a vital resource for learning. They reach a stage of readiness to learn which is related to their position in their field and move from a focus on subject and content to problem solving.
He felt that educators in the past which was based on the premise that the aim of education was ‘the transmittal of knowledge and skills’ (Knowles 1980, p. 40). He concluded that adult learners were critical of this approach which encompassed ‘fact-laden lectures, assigned readings, drills, quizzes, rote memorising, and examinations’ (p. 40). Hence he advocated an approach which was more appropriate for adult learners.

Knowles (1984, p. 227) concluded that adults want to be self-directed but often need specialist help. He stressed his belief in the use of tutors or what later became mentoring. In this approach people in your own work area assist in the development of skills, knowledge and attitudes promote the development of others by supplying a supportive framework. This approach is not only cost effective compared with sending staff away to a workshop but more effective and it helps to build a sense of camaraderie.

In the pedagogical approach adults were treated as children and given set of instructions to follow. In the andragogical approach participants learn by solving own problems which in fact is how children learn best. (Just see them work at a computer.) If possible there should be self-directed learning i.e. what participants want to know not what you feel they should know. The learning should be active rather than passive and they should be able to seek their own solutions.

There has to be a positive learning environment and opportunities are provided for experiences, which are interesting, appropriate and challenging. You need to tolerate errors, listen rather than talk, support when needed and acknowledge success. From this researcher’s own experiences one of the hardest things to stop yourself doing, is taking over the keyboard and doing it for them.

Designing learning activities

Setting the climate

This stage encompasses the preparations and having participants involved in contributing ideas, attending to the physical setting and the greeting and orientation with name tags.
You have to establishing where they are at and where they want to go. That you need to establish ‘the gap between where they are and where they want to be’ (Knowles 1984, p. 270). This is done by self-diagnosis to determine their weaknesses and needs.

The learning design model

To achieve the desired objectives, there has to be a plan of a series of activity units. These may include general sessions, small or individual groups, prefatory reading or tasks, recreation or reflection time, a happy hour or morning tea.

Managing the learning experiences

This involves deciding what materials and techniques to be used and match these to the desired objectives making sure the emphasis is on active and not passive participation.

Evaluation and redesigning

By recognizing what they have learnt participants can then raise the level of their expectations, that is establish a new gap between present behaviours and desired behaviours.

Knowles considers this to be the central tenant or dynamic of life-long learning, continuing education and andragogy. Particularly in an area like ICT he felt that what a teachers may know when they are twenty is out of date by the time they are thirty. Knowles (1970, p. 28) raised the need for the ‘prevention of obsolescence’ which is likely to occur if adults are not able to keep up with social, technological and environmental change. This feeling was captured so vividly in the cartoon in Part A of this Folio.

The analysis of the findings clearly identify the fact that there is wide-spread dissatisfaction with existing models. DECS has recognised this and established a series of initiatives so this hypothesis is supported.

8.3 Concluding comments

The primary aim of this research investigation was determine the professional development needs of Department of Education and Children’s Services (DECS)
Reception to Year 7 (R-7) teachers in South Australia in relation to classroom uses of ICT. As a result of this investigation and the analysis of the findings, it appears that these teachers do need help to ‘surf the ICT tsunami’.

The investigation indicates that there is an urgent need for ongoing professional development, particularly in country regions.
Chapter 9

Conclusions, implications and recommendations

9.1 Overview

This chapter outlines and discusses the findings from the state-wide investigation carried out in South Australia. The researcher feels that it has been a vital study even though it was only concerned with a limited number of issues. It not only revealed the urgent need for professional development in classroom uses of ICT, but identified the specific topics and the areas and locations where this help was most needed and provided suggestions for models. Its final product, the framework for a proposed MEd, would provide graduates with the skill and expertise to conduct that professional development in their own schools and districts.

9.2 Outcomes

In view of the fact that the 1998 survey indicated more than 40% of teachers state-wide were not able to use ICT effectively, the directions given for providing appropriate professional development will have to be addressed. Delegates from South Australia at the recent World Council for Computers in Education conference (WCCE 2001) reported that this figure was now less than 20%.

This very pleasing but the very recent comment from a country teacher here in South Australia, that was cited in Chapter 8 and this comment from a city teacher, indicate that there are still problems which need to be investigated.

This problem of an ageing teaching profession is becoming more acute, particularly in the ICT area. This city classroom teacher felt that she and many of her colleagues were at a disadvantage because their ICT coordinator, who was more than fifty years old, had not kept up to date. (Smith, H. 2001, pers. comm., 24 November).

The researcher hopes to continue in a role with CEGSA to encourage and provide support for these teachers, but it is an issue which DECS has begun to address on a state-wide basis.
9.3 Recommendations

In making this series of recommendations it is acknowledged just how much has been done by DECS, CEGSA, CEASA, TSOF and so many dedicated teachers and advisors. Many of the concerns raised in this investigation have already been addressed. At WCCE 2001, the recent conference of the World Council for Computers in Education, delegates from South Australia were able to demonstrate why South Australia is recognised as one of the leading states in terms of its PD programs and the level of ICT use by teachers and children.

DECS must continue to address the situation that some teachers still need help to reach the entry level, while all teachers need on-going professional development in this field if they are to progress from adopting the use of ICT to being able to adapt it to suit their own professional needs. This assistance has to be provided irrespective of teachers’ locations.

DECS needs to consider how this should be provided and perhaps consider more closely the role that could be played by CEGSA, the TSOF and the University of South Australia.

DECS needs to consider how to financially assist teachers who pursue PD at the higher education level. The suggestion of WCCE 2001 W.P.3.5 was that teachers should be reimbursed on the successful completion of their studies.

DECS has to continue to provide support through funding to schools, training trainers and expanding the services provided by the TSOF. It has already provided over ten million dollars for equipment and school-based training and over seven million dollars for the TSOF and the Global and Discovery Schools network.

Providers of professional development must accept that existing models have not been as effective as they could have been because in many instances they ignored theories applying to adult learners. A different model is needed, which encompasses the principles of collaborative and collegial learning, mentoring and modelling. There has to be a shift from an emphasis on transactional learning to transformational learning.
There has to be some systematic measurement of teachers’ growth and where they still have to progress.

Articulation pathways have to be established to make the nexus between workshop programs and higher education programs. This will enable teachers to gain recognition for prior learning.

It is hoped that perhaps the University of South Australia or Deakin University might be interested in pursuing the final outcome of this investigation by offering such a course-work Masters program to an already identified group of possible students.

9.4 Recommendations for further research

Is it time for a national survey? But this is not enough if this merely establishes that there is a problem. The solution to the problem is the vital one.

What models really are most successful? Is the use of ICT itself the most effective delivery method?

Why have DECS initiatives been so successful in reducing dramatically the numbers of teachers who still need assistance?

Does the answer lie with the educational leaders and not the classroom teachers? Are these leaders interested in a Professional Doctorate?

There needs to be a follow up study in South Australia to determine which teachers are not yet “ICT Smart” i.e. they have not yet successfully integrated ICT. But also the study could identify what strategies have worked. This investigation could be done more efficiently than this investigation’s mail-out survey. It could use an extension of the model described in Chapter 7. An email questionnaire could be sent to all schools. It could be completed on the computer and returned by email. The quantitative analysis could be carried out using newly available software and the qualitative data analysed as described in Chapter 5.

In view of the fact that the average age of DECS teachers is now over 50, is age a factor that has to be more closely investigated?
Are there demographic factors, not simply city versus country, but within regions within both?

Is gender an issue? This investigation chose not to consider this as a factor. But it would be worthwhile in a follow up survey to establish the ratio of male to female teachers in both regions and cross tabulate this with findings on ICT expertise and use.

Is the problem only a South Australian one? Informal discussions with local teachers and interstate and international colleagues and a review of papers presented at recent state and national computers in education conferences, indicate that it is not.

9.5 Concluding comments

I feel that this study has only investigated the “tip of the iceberg”. There are so many follow-up research questions that need to be pursued. Even though the investigation was set in South Australia the Folio has presented an overview of the professional development field over the past decade, not only in that state, but from a national and international perspective.

This investigation has produced the first baseline data of the professional development needs of R-7 teachers in South Australian DECS schools. It has demonstrated that there is an urgent need for professional development, particularly in country regions and has identified specific workshop areas, and it has described more effective models. As well it has provided what appears to be the first Australia-wide comparative analysis of existing course-work Master programs for R-7 teachers. It ends by presenting a framework for a course-work MEd program for those teachers who wish to pursue this line of professional development.

Finally the overall investigation and the presentation of the findings in this Folio have shown how ICT can be used to make research more efficient and hence more effective. It is hoped that other colleagues in the same field, who may wish to pursue some of the suggested areas for future investigation, can use some of the strategies. I would be very pleased to share his experiences and approaches with other students who have read this work in this format or from a CD-ROM or my website.
PART D

FINAL COMMENTS

This section, which is the last of the four elements that make up the Folio, provides an overview of the whole Folio and a reflection on the research that has been conducted.
Introduction

When I looked back over the Folio just before submitting draft final copies to my supervisors I realised that as an entity it had an introduction, an explanation of the links between three parts and it appeared to have a sustained theme and it consistently pursued its thesis. What was lacking was an overall conclusion or summary. It was like an essay with a beginning, middle, and no end. There was a missing piece of the jigsaw puzzle or there was a part missing from the many parts that made up the one body—*Multa membra unum corpus*.

The decision was made, therefore, to include this final section. It has enabled me to reflect on my “journey” over the past six years and provide an overview of the Folio. This stage of the research journey is over, but after a rest, it will be time to pursue some of the possible future areas of investigation, which have arisen from this study.

Reflections

To write this section I looked back through the journal, which was started in 1995 as part of the unit ‘Workplace Research’. Even though I retired at the end of that year, I continued to make entries. The journal has recorded the highs and lows of my journey as a very mature age EdD student. The entries not only reflect on my growth as a researcher and writer but on the program itself. As a distance student working on my own, it has served as a confidant, a safety valve and most of all a reminder that what I was doing was worthwhile and important and that despite everything I would complete the journey. The idea is recommended to other students. It gives a reminder of where you have come from, where you are at present and where you are headed.

In the journal I have used the recurring motif of my study being a sailing journey through uncharted waters because when I started my EdD no student had completed this program. Unlike a PhD there were no models to follow. From the start I felt I knew where I wanted to go but I didn’t know where to start. I set off from Darwin feeling very elated but also apprehensive. I was looking at a journey of at least six years, knowing I would face uncertainties and unforeseen problems. Little did I know just what was to happen. If I had, I perhaps would never have started.
Many times I have faced strong headwinds or been becalmed. There have been storms and several times I have nearly “drowned’ but was rescued each time. Often I felt like giving it all away but I always knew someone from Deakin was there to help.

As I approach the finish and look back through my journal, I appreciate the fact that in many ways, it is not just reaching the final destination that is so important, but the journey itself. After a well-deserved break I will be starting my plans for my next research journey! This will be to pursue some of the possible future areas of investigation, which have arisen from this study. I end this section by sharing some of the “highs” from entries in my journal: there are no “lows” because of their very personal nature.

“Highs”:

1994: initial meeting with Chris B in Geelong to discuss entry into the EdD and shared his enthusiasm and passion for the program and what it offered me.

1995: meeting other students for the first time and realising how the program catered for our diversity of backgrounds and research interests.

1996: completing Part 1 of the program by “passing” the proposal colloquium. Had enjoyed the structured work but couldn’t really see how it helped me prepare for the research to follow.

1997: received an APA Scholarship and became the first full-time student in the program

1998: awarded the AARE Travel Award to present a paper on my research: wrote two successful funding submissions for state-wide PD projects involvement in organising and running two national conferences: opportunity to interview leading overseas speakers.

1999: good progress and submitted premature Notice of Intent just before serious car accident.
2000: meeting my fourth (and final?) supervisor: invited to participate in a Senior Leaders Intensive Workshop and had interview with Andy Hargreaves and received a signed copy of his latest book.

2001: four abstracts accepted for WCCE 2001: relief and euphoria after presentation of paper on my research: participation in IFIP Working Party 3.5: helping a new student at the DUSA2001 Conference: received an invitation from HERDSA to submit a paper for a Special Issue: sending in Notice of Intent to Submit.

**Overview of the Folio**

**My own growth**

When I look back to 1994 I am staggered by how I have progressed as a researcher, a writer, a presenter and as an ICT user.

The range of research strategies and activities indicate my growing expertise as a researcher. The most important data collection strategy was the state-wide survey of 467 schools and the subsequent analysis of huge masses of quantitative and qualitative data. Conducting more than twenty interviews, transcribing them and then analysing the data was a second invaluable source of data. Using email to conduct a survey involving all Faculties of Education in Australia and to conduct interviews with respondents here and overseas was a learning experience for me.

My thesis for my MEd in 1992 was a slim document of less than 65 pages, excluding Appendices and References: one examiner remarked that it was a weak thesis: I agree. This Folio is more than 300 pages, excluding Appendices and References. As a former postgraduate supervisor, I feel this Folio is more coherent and better supported by the literature. The underlying and the sustained theme of ‘Moving better practice in ICT from the few to the many’, upholds the thesis that there is a need for ongoing, continuous professional development.

When I started my study I was certainly not a novice ICT user, but now thanks to Deakin University Postgraduate Workshops, I am a more than average user of a wide range of statistical, analytical, bibliographical, word-processing, multi-media and presentation software. Even as late as September 2001, at a postgraduate workshop, I
learnt so much about working with very large documents and constructing and placing graphs and charts.

This list of my most used packages shows the diversity of my growth and expertise. They are: Statview, SPSS, Excel, NUD*IST, EndNote, PageMaker, Word, MacroMind Director, Adobe Photoshop, Presentation Magic and PowerPoint. As well I have created my own Website and “burn” my own CD-Roms, including a complete version of this Folio with text, graphics, images and sound.

In the first presentation I made at a World Conference in 1990, I used a series of typewriter generated OHPs. The other multi-media component was a cassette recording of didgeridoo music created on an Amiga 500 computer. At the corresponding conference in Copenhagen in 2001, my presentation was “burnt” onto a CD-ROM, which contained text, graphics, images, video clips, sound and links to my web-site, Deakin University and the Technology School of the Future in Adelaide.

I now use this expertise in running a small business called CHIPS (Computer Help Instruction and Printing Services). I produce and print several bulletins or journals a month and conduct help sessions in my workroom or in people’s homes.

Because the underlying theme of the whole study has been ‘Moving better practice in ICT from the few to the many’, it has been fitting that I have been part of this continuing professional development myself. Now in my “mature” years my study has been yet another stage in my own “life-long” learning. I eagerly look forward to the next stage.

Conclusion

This Folio represents my “humble” contribution to the Education profession. I believe it has demonstrated my capacity to conduct independent research in my field of teacher professional development in classroom uses of ICT. As well, it has shown the synergy that has to exist between research and practice. Finally, it offers practical solutions to the problem that was under investigation.
APPENDICES
APPENDIX A

Educating the educators:  
the unique Northern Territory approach

The Fifth World Conference on  
Computers in Education  
Sydney 1990

Background to the paper:

When I was recruited there in 1987 as the first lecturer in educational computing at the then Darwin Institute of Technology, I operated from the School of Maths and Applied Science, because the Faculty of Education had no courses of its own nor any computing facilities for students. I had the task of producing units for the Faculty of Education and then delivering them.

Because I was also involved in practicum supervision I was able to evaluate the effectiveness of the units I delivered by observing my students in the classroom. This led to changes in the units to ensure that they met the changing needs of my students.

At the time of writing the paper I was attached to the Northern Territory Computer Education Centre and it was my abstract which was accepted. In the actual presentation of the paper I was joined by my two colleagues from that centre.

Introduction

Barely ten years ago there were no computers in any schools in the Northern Territory. Since 1984 all government schools have had computers. There are now over 1700 computers for some 35000 students. Like England several years before,
the Northern Territory found itself in a situation where there were so many computers in the schools, but there were not enough teachers with the expertise to be able to use them effectively.

The Faculty of Education at the Northern Territory University found itself in a real dilemma. There were ever increasing demands for it to provide appropriate computing courses for its pre-service and upgrading teachers, but it had no facilities or resources and none of its lecturers had used computers when they were classroom teachers. An approach was made to the Faculty of Maths and Applied Science where the Education Department’s Computer Education Centre was located. As a result a series of units were developed by lecturers from that faculty and by the staff of the Computer Education Centre.

My Role

In 1987 when I was appointed to the Faculty of Maths and Applied Science my prime function was to deliver all the units from the compulsory Introduction to Educational Computing for the more than a hundred Dip T students, to a Computing Method unit for one student in the Graduate Diploma of Education.

The approach I have used was to enable my students to progress through the three stages I had myself. Firstly they were given activities which gave them success and hence confidence. Next came a feeling that they were competent and finally they were able to work towards using the computer and related technologies to create a range of classroom materials and activities.
EDUCATING THE EDUCATORS:

THE UNIQUE NORTHERN TERRITORY APPROACH

ABSTRACT

All government schools in the Northern Territory, which have power, have computers. However, despite an extensive in-service program, there are nowhere near enough teachers able to use them effectively, let alone to take advantage of the opportunities offered by the new technology.

This situation is being addressed by the NT Computer Education Centre, a joint facility set up by the NT Education Department and the NT University. This unique structural arrangement meets the needs of the education industry by enabling the extremely effective delivery of courses and support services to both pre-service and in-service teachers.

This paper outlines how we are educating the educators of today and tomorrow so that they can make the most of the exciting challenges in the field of educational computing.

Learning is now viewed as a journey of discovery rather than the acquisition of knowledge. As part of their 'journey' my students have produced the video-tape to be shown. It is part of an integrated teaching package to accompany the simulation game ‘Secrets of Science Island’.
1. **A NEW PARADIGM FOR LEARNING**

Marilyn Ferguson in ‘The Aquarian Conspiracy’ expressed the view that no longer can learning be considered as a product or destination, but rather as a process or a Journey of discovery.

This process of discovery confirms the wisdom of the Chinese aphorism.

> I hear and I forget
> I see and I remember
> I do and I understand

At the 1988 Computer Pals Across the World Conference in Alice Springs, this change in direction was clearly expressed by Lyn MacIver of the Commonwealth Employment Service. ‘Education needs to be about inquisitiveness and less about acquisition.’ We need to ask how we can arouse in our students this curiosity. In particular I am concerned with those students who will be the educators of tomorrow.

2. **THE NORTHERN TERRITORY SITUATION**

Many of the 90 of our first year students in the B.Ed program, lack the basic skills and competencies to be able to use a computer effectively. In our educational computing units, which I will describe later, we address these needs.

Students, who have successfully completed the range of units we offer, will realise how the computer can assist them to make the learning experiences for their students more efficient, effective and enjoyable.

3. **THE NORTHERN TERRITORY APPROACH**

3.1 **BACKGROUND**

Computer Education in the NT had its origins in the late 1970's with use made of mark sense cards and packages from the Angle Park Computing Centre in South Australia. Ten years ago there were no personal computers in any government school in the NT: today there are over 2000: all schools which have power have at least one computer. A typical primary school with 250 students has 20, an urban high school with 1000 students has 150.

In 1984 the NT government set up a $2:1 subsidy scheme for all schools private and government in the NT, for the purchase of computer hardware. The maximum amount of such subsidy was determined by the school’s classification. In addition there was a $1:1 funding for amounts not covered by the $2:1.

This is a pleasing situation which has been achieved by the efforts of enthusiastic teachers, hardworking parents and supportive "powers that be”, but it is to no avail if this valuable resource is not being used to enhance the learning environment because there are not enough teachers with the appropriate knowledge, skills and what I call "attitude".

This situation was addressed in two ways in the NT. There was action by the Government through the Education Department and by the then Darwin Institute of Technology. A policy statement on Computer Education was circulated in October 1983. A comprehensive Computer Education In-service program commenced in
1984 at the Computer Education Centre which was (and is) a joint initiative between the NT Department of Education and the then Darwin Institute of Technology.

In 1984 alone there were 79 in-services for a total of 1675 teacher in-service days. It is interesting that 60% of the participants were women. As successful as the program was in providing basic computing skills for so many practising teachers, there were still no computing units offered in the Diploma in Teaching B Ed program at DIT because the Faculty of Education had neither the resources nor the personnel.

In January 1985 an approach was made to the Head of Department of Mathematics and Computing in the School of Technology and Science (now Faculty of Applied Science) about offering a one-term unit (ten weeks, two hours per week) which was eventually called ‘Computers across the Curriculum’ as a compulsory unit for all first year students. This unit was offered in Terms 1 and 2 of 1985 and was over-enrolled. All the students in second, third and fourth years were desperate to get some computing knowledge because they had all experienced the use of computers in schools during their teaching practice sessions.

This unit was delivered using the facilities of the Computer Education Centre in the Technology and Science building at Darwin Institute of Technology, a laboratory containing fifteen Apple Ile's networked with Digicard. Sometimes we had to bring in one or two more computers to cope with the overflowing classes!

3.2 THE COMPUTER EDUCATION CENTRE
The unique administrative structure of the Computer Education Centre was outlined in a paper jointly produced by the Manager of the Centre and the Principal Education Officer Computer Education.

‘The Computer Education Centre is a joint facility, and it was set up by the NT Department of Education, through its Curriculum Branch, and the then Darwin Institute of Technology. At the time of its creation (1983/84) both institutions recognised the need for a training facility of microcomputers and the Government decided to fund a joint exercise, to maximise use of available resources.

This Centre is unique in Australia, as its charter, determined by an Agreement between the two institutions, clearly specifies its functions. It has enabled a vertical integration of expertise in computer education, ranging from pre-service of teachers, through to in-service and advisory services for teachers in the field.

The Department of Education has seconded two Senior Education Officers to the Centre. The Principal Education Officer is also housed within the Centre to provide details of policy and Departmental needs.

The NT University has provided a lecturer and an administrative assistant to complement the above, and to provide services within the Education Faculty.’

This unique structural arrangement has enabled an extremely effective delivery of courses and support services to both pre-service and in-service teachers and ensures an immediate and ongoing interchange of ideas and teaching packages.
It is the stated aim of the Northern Territory Department of Education that, 
'Schools shall use computers, where appropriate, 
for teaching and learning across the curriculum.'

This has had widespread implications: there has had to be an intensive in-service training program and the provision of a large quantity of software and hardware. There are over 2 000 personal computers in Northern Territory schools: all schools, which have power, have at least one computer. However, there are still not enough teachers, particularly in primary schools, with the confidence or expertise to use computers effectively across the curriculum.

This situation is being addressed by the Computer Education Centre, which continues to provide a range of in-service activities for classroom teachers, and by the Faculty of Education which offers a range of units in educational computing. As well the Computer Education Centre continues to provide a range of in-service activities for classroom teachers. In December 1988 we moved into a new centre, the equipment for which was funded by the NT Education Department as a new and current initiated grant.

There is a Macintosh Lab, a Micro Lab with Apple IIe's and Amiga 5001s and a restricted access room with a range of Apple's, IBM's, Atari's and Amiga's, a Digital Scanner attached to a Macintosh II, a Video Disk system, a CD ROM Player, a Macintosh Datashow and a large screen display unit. This room is set aside for student and staff research, materials preparation and in-service activities.

4. EDUCATIONAL COMPUTING COURSES AT NT UNIVERSITY

The Faculty of Education has clearly accepted the view that computers have an important supporting role in education, enhancing and enriching the present curriculum and providing the opportunities for exciting changes in the future. By availing themselves of the services, resources and expertise of the Computer Education Centre, they have been able to provide an extensive range of educational computing units, which will provide students, who have successfully completed them, with the skills, expertise and confidence to use computers appropriately in their classrooms.

They will be in some ways agent provocateurs or instruments of change. They will be the directors of the educational impact of this powerful medium of instruction and learning. They will question what is being done with computers. Are the activities enhancing and improving what goes on in the classroom? They will realise that the computer is not a "quick tech fix" to satisfy the demands for improved literacy and numeracy.

4.1 COMPUTER AWARENESS — A

Since 1985 this has been a compulsory unit for all students in the Faculty of Education. Approximately 90 students take this semester length (30 hour) unit each year. All but a handful of these are prospective primary school teachers. 95% of the students are female. Only about 20% of the students have taken any computing courses before.

The basic purpose of the unit is to let the students experience the variety of ways in which a computer can be used in schools and to give them the confidence to experiment on their own. Emphasis is placed on the use of word processing packages because word processing is the most common computing activity in our primary
schools. The unit will be re-accredited this year and its title will be changed to An Introduction to the Use of Computers in the Classroom. This will reflect the subtle changes that have been made to the content and direction of the unit.

4.2 COMPUTER AWARENESS — B
This unit introduces students to the uses of computers in the classroom and enables them to experiment in a variety of areas.
For most of our students this unit starts them off on their journey of discovery in the world of educational computing. They not only have basic skills and competencies, but also enough "hands on experience” and confidence to go forward.

Our other units provide the opportunity to continue this journey. In these units they look at existing classroom practices and consider how they could be improved or enhanced using computers and computer technology. They examine how computers are being used in terms of structural arrangements, i.e. networks, or stand-alone, computer rooms or classroom mobiles. They look at types of hardware and software and prepare teaching and support materials. They consider resource management and the conduct of school based in-service activities.

4.3 COMPUTERS IN SOCIETY
This unit not only looks at the impact of computers on society, but focuses on actual classroom uses of computers, particularly in the one computer primary school class room. The students visit schools, work with students at NTU and produce a range of teaching materials. As well they work on individual projects such as audio-visual presentations of the impact of computers on society, surveys of the most popular packages used in primary schools or papers such as ‘Gender Roles in Female Dominated Primary Schools.’

This year in conjunction with our media Centre they have produced an integrated teaching package to accompany the simulation game ‘Secrets of Science Island.’ The package contains teaching ideas, handouts and a video. A group of tomorrow’s educators have produced a teaching package for the teachers of today.

4.4 COMPUTERS, CURRICULUM AND THE CLASSROOM
This unit is designed to enable students to appreciate the role of computers across all areas of the school curriculum and to develop familiarity with computer education policy applied to NT schools. In this unit the intention is that the students will be working on a project involving a Computer Pals Across the World link with a school in Bali and a local secondary school in Darwin. They will be setting up the exchange and working with the students.

4.5 COMPUTING METHODS
In this unit, which is taken by practising teachers, students look at Education Department policy, curriculum issues and specific teaching areas.

4.6 GRADUATE DIPLOMA IN EDUCATIONAL COMPUTING
This course, which we will offer for the first time in Semester 1 1990, concentrates on the instructional and applicational uses of computers in education. When we sought expressions of interest in this course, we were overwhelmed by the response. More than 70 teachers responded in less than two weeks.
5. **CONCLUSION**
I feel that educational computing is poised at the crossroads: two years ago we were ‘on the crest of a wave’: tomorrow - Quo vadis? The B.Ed students at NTU, the educators of tomorrow, have started on their own journey of discovery in the world of educational computing. They will leave us aware of potential of the computer as an aid and tool in education. They will be aware of the new direction in education and the impact of computer technology upon curricula and methods and they will be able to use this technology to enhance the learning experiences of their students.

6. **REFERENCES**


NT Department of Education (1987), Information Statement No.13
APPENDIX B
APPLICATION FOR CEASA GRANT
‘MAKING IT WORK FOR ALL’
Appendices

Council of Education Associations of South Australia Inc.
Phase 2 Funding 1997
Application Form
ASSOCIATION Group of Associations
CEGSA Computers in Education Group of South Australia
ECHO Early Childhood Organisation

<table>
<thead>
<tr>
<th>Person making the application</th>
<th>Owen Burgan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Phone</td>
<td>8365 53 42</td>
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<tr>
<td>Work Fax</td>
<td></td>
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<tr>
<td>Home Phone</td>
<td>8365 53 42</td>
</tr>
<tr>
<td>Postal Address</td>
<td>22 Baroota Av Rostrevor</td>
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NAME OF PROGRAM
Making IT work for all.

Description of the proposed professional development activity
Creating a model for professional development in IT by working with Early Childhood teachers and IT co-ordinators in three of the country regions so that they will in turn have the expertise and materials to replicate the activity in their own schools.

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<td>English</td>
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<td>Quality Teaching and Learning</td>
<td>Workshop</td>
<td>Maths</td>
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<td>Achievement for Everyone</td>
<td>Minicourse</td>
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<td></td>
<td>Other please describe)</td>
<td>Health and PE</td>
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<tr>
<td></td>
<td>Video keynote from city to use in country</td>
<td>The Arts</td>
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DATES
Date of completion of professional development Program?
Final report to CEASA

LOCATIONS
Please detail

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<tr>
<td>Naracoorte</td>
<td>November 28</td>
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<td>Pt Lincoln</td>
<td>T.B.C</td>
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Estimated Target Audience:
Total Number Numbers by Sector Number by Level of Schooling

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Appendices

<table>
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<th>8-10</th>
<th>11-12</th>
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Does this program involve DECS curriculum personnel?  Yes ❑  No ❑
Please detail
Jim Dellitt - Superintendent of Curriculum will present the opening address at the city conference. The video of this address will be used in the country.

Does this program involve partnerships between associations?  Yes ❑  No ❑
Please detail
CEGSA and ECHO have formed a planning group who are working collaboratively to implement the professional development activities

MEETING THE 1997 DECS PRIORITIES see attached sheet)
Please indicate how your existing program addresses any of the priorities by relating the relevant outcomes of your program to them.

The Early Years
This program offers teachers the opportunity to enhance their own IT skills as well as discuss and share successful programming strategies to use IT in their own classroom/worksite settings. Opportunity will be provided to view up-to-date software. The program will provide the opportunity for teachers to:
- continue to build bridges that help children easily make the move from one year to another and from one setting to another.
- support children to learn to read and write, to add and subtract, multiply and divide to achieve Level One of the Statements and Profiles.

Quality Teaching and Learning
This program through its design will:
- provide teachers with new curriculum materials and further professional development in teaching and assessment.
- develop further mathematics and literacy skills of students through the sharing of successful learning programs in IT.

Using Information Technology Across the Curriculum
This program will provide teachers with training and development in IT and through the use of school based co-ordinators will continue to work towards developing standards for the use of information and communication technology in the curriculum. Early Childhood participants will enhance their own IT skills and work on ideas and strategies to implement IT in their own classrooms. They will have materials and teaching ideas to apply IT across the curriculum. IT co-ordinators will have a model to run their own in-service activities: they will have access to the latest software and hardware.

EVALUATION: what will be evaluated and how will the effectiveness of the program/activity/project be measured? - See Phase 2 Proposal - 9. Program Evaluation
In line with CEASA expectations, statistics will be collected from participants as part of the evaluation undertaken at each conference.
An appraisal of each session will be completed on an evaluation survey.
The information will be collated and reviewed to inform the planning committee of modifications, which may need to be made to improve future training and development activities.

USE of FUNDS: please describe how the funds are to be deployed
Funds will enable CEGSA and ECHO to run three country workshops. In each case there will be a half-day workshops for E.C. teachers and IT co-ordinators, after school sessions for other teachers and an evening open house display, forum, ideas exchange. Funds will cover TRT for teachers preparing and delivering the workshops, travel to the venues, overnight expenses at Pt Lincoln and Naracoorte and production of materials and software. A consultant will be paid at the same TRT rate.
Appendices

Air travel costs more but saves 2 TRT days at Pt Lincoln and Naracoorte.

BUDGET see sheet ‘Some Costings’

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<tr>
<td>Consultancy fee 4 days at TRT rates</td>
<td>$900</td>
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<tr>
<td>Accommodation and T.A.</td>
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<tr>
<td>Travel air and car</td>
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<tr>
<td>Materials</td>
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Funds requested $4900

Make Cheque Payable to

We wish to use the CEASA TRT Bank Yes ❑ No ❑

Name of Person making proposal

Signature

Collaborating Associations

<table>
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<td>President’s Name</td>
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For more information or assistance in completing your application contact: Lindsay Matthews
CEASA Professional Officer
APPENDIX C
QUESTIONNAIRE — SURVEY INSTRUMENT
TEACHERS’ PROFESSIONAL DEVELOPMENT IN I.T.
Appendices

DEAKIN UNIVERSITY ETHICS COMMITTEE
LETTER TO PARTICIPANTS

My name is Owen Burgan. I am a student in the Doctor of Education (EdD), degree in the Faculty of Education at Deakin University. I have been involved in educational computing for over a decade as a classroom teacher, postgraduate student and lecturer. I am currently Vice President of the Computers in Education Group of South Australia.

My research study, ‘An investigation of the needs of classroom teachers K-7 for a Masters level program in Classroom Uses of Information Technology’, is being conducted under the supervision of Paul Nicholson, lecturer in Educational Computing, on the Burwood Campus. This study has been approved by the DETE Research Council. Enclosed is a copy of the letter, which I was asked to send to you when I contacted you to seek permission to proceed with my research at your school. The first part of my study as part of my EdD program is to establish, in general, what are the P.D. needs of teachers and, in particular, if there is a need for such a program, and if so what should be in it and how should it be delivered.

If you agree to take part in this study by granting me access to your school, could you please complete the consent form for Principals and place it in the envelope marked Consent Forms. Could you then please pass on the other materials to your I.T. or Computing Coordinator. After the enclosed survey form has been completed, which should take no more than ten minutes, it is to be placed in the envelope marked Survey. The participant’s consent form is to be placed with your own in the envelope marked Consent Forms. Both envelopes are to be returned via the courier service as soon as it is convenient for you, but by April 9 at the latest.

Further details of the study are to be found in the enclosed Plain Language Statement. If there are any questions that you have with regard to this study, please feel free to contact me or my supervisor, who is Paul Nicolson.

Phone: (08) 8365-5342  (03) 9244 6922
E-mail: oburgan@deakin.edu.au  pauln@deakin.edu.au
Address: 22 Baroota Avenue  221 Burwood Highway
Rostrevor S.A. 5073  Burwood Vic 3125

Thank you for your assistance.
DEAKIN UNIVERSITY ETHICS COMMITTEE
CONSENT FORM FOR PRINCIPALS

I, of

Hereby consent to be a subject of a human research study to be undertaken by Mr Owen Burgan by granting access to the school. I understand that the purpose of the research is to establish the needs of classroom teachers for a Coursework Masters Level Program in educational uses of information technology.

As well, data gathered will help provide information as to what should be in such a program and how it could be delivered.

I acknowledge

1. That the aims, methods, and anticipated benefits, and possible hazards of the research study, have been explained to me in the Plain Language Statement.

2. That I voluntarily and freely give my consent to my participation in such research study.

3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.

4. Individual results will not be released to any person except at my request and on my authorisation.

5. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature:

Date:
Plain Language Statement

Dear colleague,

My name is Owen Burgan. I am a student in the Doctor of Education (EdD), degree in the Faculty of Education at Deakin University. I have been involved in educational computing for over a decade as a classroom teacher, postgraduate student and lecturer.

My research study, ‘An investigation of the needs of classroom teachers K-7 for a Masters level program in Classroom Uses of Information Technology’, is being conducted under the supervision of Paul Nicholson, lecturer in Educational Computing, on the Burwood Campus.

The first part of my study as part of my EdD program is to establish, in general, what are the P.D. needs of teachers and, in particular, if there is a need for such a program, and if so what should be in it and how should it be delivered.

I would like to invite you to take part in this study by first completing the consent form for participants and placing it in the envelope marked Consent Forms. After you have completed the enclosed questionnaire, which should take you no more than ten minutes, could you then please return it to me in the envelope marked Survey.

The system of two envelopes will ensure the confidentiality of your responses on the survey. The two envelopes will be handled in such a way that there can be no connection between your personal details on the Consent Form and the Survey. The envelopes will be sent to me unopened by the DECS distribution centre.

If you would be interested in further participation, appropriate information will be sent to you if you so indicate on the cover page. You are most welcome to duplicate these materials for any of your colleagues who would like to participate.

If you would like further details or just to talk to me, please contact me either by telephone, email or mail. I hope that you will agree to participate, as the data obtained from this survey are vital for the next stages of my research. When data from this project has been processed a summary report will be sent to your Principal for distribution to those who took part in the study.

As it is envisaged that the final “product” will be in the form of a CD-ROM, all participants, if they desire, will receive a copy. This CD-ROM should be a valuable resource as it will contain survey data, details of existing programs and the framework for a proposed program, current references and resource materials and details of relevant journals and conferences.

If there are any questions that you have with regard to this study, please feel free to contact me:

Phone: (08) 8365-5342
Appendices

E-mail: oburgan@deakin.edu.au
Address: 22 Baroota Avenue
Rostrevor S.A. 5073

Thank you for your assistance.

NOTE:
Any participation is entirely voluntary and participants are free to withdraw at any stage.
All information collected in this study is strictly confidential.
The identity of all persons will remain anonymous and confidential.
In all documents you will be referred to by a coded alias.

CHECKLIST
1. Complete the Consent Form for Surveys and place it in the envelope, Consent Forms.
2. Complete the Survey and place it in the envelope, Surveys.
3. Return both envelopes via the Courier by April 9 at the latest.
DEAKIN UNIVERSITY ETHICS COMMITTEE
CONSENT FORM FOR SURVEYS, QUESTIONNAIRES

I, of

Hereby consent to be a subject of a human research study to be undertaken by Mr Owen Burgan and I understand that the purpose of the research is to establish the needs of classroom teachers for a Coursework Masters Level Program in educational uses of information technology.

As well, data gathered will help provide information as to what should be in such a program and how it could be delivered.

I acknowledge that

1. That the aims, methods, and anticipated benefits, and possible hazards of the research study have been explained to me in the Plain Language Statement.

2. That I voluntarily and freely give my consent to my participation in such research study.

3. Upon receipt, my questionnaire will be coded and my name and address kept separately from it.

4. Any information that I provide will not be made public in any form that could reveal my identity to an outside party i.e. that I will remain fully anonymous.

5. Aggregated results will be used for research purposes and may be reported in scientific and academic journals.

6. Individual results will not be released to any person except at my request and on my authorisation.

7. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me, will not be used.

Signature:

Date:
A RESEARCH PROJECT

TEACHERS’ PROFESSIONAL DEVELOPMENT IN I.T.

Establishing the need for a Coursework Masters Level Program in Classroom Uses of I.T.

Conducted by Owen Burgan, Faculty of Education, Deakin University

Please note: This cover will be detached, a coded reference will be assigned to each return and the cover will be filed separately from the survey document. Although the survey will be conducted with the approval of the Department for Education and Children’s Services in South Australia, all information is collected in the strictest confidence. The identity of schools and individuals will remain ANONYMOUS and CONFIDENTIAL. No identities will be revealed to any person or AUTHORITY.

Please print clearly the name of your school: ..................................................
If you wish to remain anonymous as a participant in this study do not fill out the details below. However if you are willing to participate further you will need to identify yourself.

Please print clearly the following information:
Your name
Contact address
Work phone number............................
After hours phone number........................ Email address.............................
I do/do not wish to receive a copy of the CD Rom version of the completed project.

TEACHERS PROFESSIONAL DEVELOPMENT IN I.T. SURVEY

Establishing the need for a Coursework Masters Level Program in Classroom Uses of I.T.

SECTION A: THIS IS TO PROVIDE DEMOGRAPHIC INFORMATION

If you do not understand a question or it does not apply to you, do not answer just go on to the next question.
Appendices

Q.1  Are you country or city based?  City ☐  Country ☐
Which region? Central ☐  North ☐  South ☐  East ☐  West ☐
   South East ☐  Riverland ☐  West Coast ☐  Mid North or Y.P ☐
   Southern ☐  Other ☐
Q.2  The number of teachers in the school is?
Q.3  Do you hold a position as a computing or I.T. coordinator? Yes ☐ No ☐
Q.4  Do you have any academic qualification in educational computing? Yes ☐ No ☐
   If the answer was ‘Yes,’ what is it? ________________________________________
Q.5  If the answer was ‘No’ would you consider undertaking a Coursework Masters Level Program in Classroom Uses of I.T.?
   Not at all ☐  Possibly ☐  Definitely ☐
Q.6  Which mode of delivery would appeal to you most?
   on campus ☐  summer school ☐  off campus ☐  electronically ☐
Q.7  One model program could offer the following 4 units and then a major project. How would you rate these units from 1-4 with 1 being most desirable.
   Resource Management ☐ I.T. & Society ☐ Classroom Uses ☐ Computers & Learning ☐
Q.8  List below other units you would like included.
Q.9  How many of your colleagues would you rate in each category
   Novice ☐ Below Average ☐ Average ☐ Above Average ☐ Outstanding ☐
SECTION B: ASKS YOU WHAT YOU CONSIDER ARE THEIR NEEDS

Put a tick in the box which best describes your response to the following:

Q.10 I think they should be offered these activities:

1. Show and Tell Demonstrations of new software and hardware
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

2. Software Training Courses
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

3. Hardware Training Courses
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

4. Hands on Workshops
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

Q.11 I think they should be offered these workshops. Please enter any others.

1. Internet Workshop
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

2. Multi Media Workshop
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

3. Desk Top Publishing Workshop
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

4. Cross Curriculum Workshop
   - No □ Undecided □ Agree □ Strongly agree □ Essential □

5. Workshop on............................
   - Agree □ Strongly agree □ Essential □

6. Workshop on............................
   - Agree □ Strongly agree □ Essential □

Thank you for your assistance in this study and for the time you have taken to complete this survey. Section C gives you the opportunity to make any comments or suggestions.
Appendices

SECTION C: GIVES YOU THE OPPORTUNITY TO MAKE ANY COMMENTS.

If you would like to make any comments about this survey or teachers’ professional learning in classroom uses of Information Technology please use this blank page. You might like to express your concerns or ask questions or make suggestions about approaches that could be used. If you need more space just add pages and attach them to the survey.
APPENDIX D
SURVEY CODED RESULTS
## CODED RESPONSE MATRIX

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APPENDIX E
SAMPLE NUD*IST ANALYSIS PRINTOUT
DEFINITION OF NODES

(1) /MEd
*** Definition:
Comments/ concerns about personal appeal of an MEd.
*****************************************************************************

(1 1) /MEd/No Quals
*** Definition:
Search for (INTERSECT (1) (10 3 2))
*****************************************************************************

(1 2) /MEd/Quals
*** Definition:
Search for (INTERSECT (1) (10 3 1))
*****************************************************************************

(1 3) /MEd/Obstacles
*** Definition:
Perceived obstacles to formal study.
*****************************************************************************

(2) /Training
*** Definition:
Attitudes toward training: general and IT.
*****************************************************************************

(2 1) /Training/Access
*** Definition:
Factors that affect access to relevant/ appropriate training.
*****************************************************************************

(2 1 1) /Training/Access/Co
*** Definition:
Search for (INTERSECT (2 1) (10 2 2))
*****************************************************************************

(2 2) /Training/Skill base
*** Definition:
Comments about the importance of identifying skills/ needs of educators.
*****************************************************************************

(2 3) /Training/T&D Needs
*** Definition:
Ideas about the focus of training activities and support materials.
*****************************************************************************

(3) /D.E.T.E.
*** Definition:
Issues that pertain directly to D.E.T.E's role/ resources.
*****************************************************************************

(4) /PD Model
*** Definition:
Ideas about structure, content and delivery of PD activities.
*****************************************************************************

(4 1) /PD Model/IT-Attitudes
*** Definition:
Attitudes toward IT and its acceptance in school environments.
***************************************************************************************
*************
(10) /Base Data
*** Definition:
Demographic data on respondents.
***************************************************************************************
*************
(10 1) /Base Data/Gender
*** No Definition
***************************************************************************************
*************
(10 1 1) /Base Data/Gender/Male
*** No Definition
***************************************************************************************
*************
Results

Below is an example of a print out from one section of the analysis. It contains notes and memos made at the time for future reference or responses to follow up or quote.

Q.S.R. NUD.IST Power version, revision 3.0.4d GUI.  
Licensee: Owen Burgan.


********************************************************************
************
(4) /PD Model
*** Definition:  
Ideas about structure, content and delivery of PD activities.
*** The siblings of this node are:
  (1) /MED
  (2) /Tng-Atts
  (3) /Ed Dept
  (5) /W-500
  (10) /Base Data
*** The children of this node are:
  (4 1) /PD Model/IT-Atts
*** Documents indexed by this node are:
  1: Respondent 10  2: Respondent 12  3: Respondent 13  4: Respondent 16
  5: Respondent 17  6: Respondent 19  7: Respondent 20  8: Respondent 21
  29
  13: Respondent 3  14: Respondent 30  15: Respondent 5  16: Respondent 6
  17: Respondent 8  18: Respondent 9
*** This is 18 documents out of 30, = 60%

*** Memo:
12:10 pm, Mar 24, 1999.

[R10]: issues = relevancy, classroom management, access to machines, flexibility of the timetable

IT COORDINATION AND PERSONNEL

[R12]: more people in coordinating positions to facilitate information sharing; develop a checklist of essential items for new coordinators (ie. to answer the question: where does one start?); [R13] train the trainers.  
[R27] more time allocated to IT coordinating] and have people in those positions who understand teaching/ learning methodologies; think across curriculum.
TEACHERS
[R 24][R 9] foster a self-reliant attitude in teachers ... need to see
themselves as solution seekers; [R 27] focus on across curricula
approaches ... have to change way people think about teaching
methodologies.
[R 8] determine the needs of teachers; develop strategies to satisfy
them; style of information delivery to suit the needs of teachers as
learners.

FLEXIBILITY - LOCATION
[R 12] establish regional hub groups and localised training; [21][23]
PD has to come to the country. Consistent with this, [R 3] argues for
a more flexible, localised approach to planning/provision/content
of training opportunities.

EFFECTIVE LEARNING
[R 19] one-off workshops are ineffective (tend only to raise
awareness; short courses allow time for confidence/practice/
questioning.
[R 3] 1-2 day courses are ineffective: IT is learnt in little steps ...
practice, trial and error, confidence re mastery.
[R 21] Must be hands-on AND needs to be accompanied by hand-outs (to
assist knowledge retention).

*Q = how best to maximise/reinforce learning when new skills won't
be used immediately?

[R 30] piecemeal learning ... day/hour here and there (proposed a
term's study leave every 5-7 years)
*Quote [R 30]: 'one of the keys to developing skills is creating the
time for people to be able to learn and encouraging them to go on'.

[R 17] IT teacher concurrently trains teacher/students one week
(focus = teach skills); teacher alone the next (focus = reinforce
skills) ['thus forcing the teacher to take IT']; [R 29] IT room
allows team approach to skills
development.

[R 6] Read this (TAFE Model v one day courses).

RELEVANCE/ FLEXIBILITY
[R 5] if teachers can't apply the skills learnt, they tend to switch
off.
[R 20] training based on/in response to real, immediate needs.[worth
reading this in detail .. might like to use extract as quote].

[R 21] wider choice of training topics.

[R 16] generic software courses (ie. not dependent on the latest
software because many schools won't have it). Other topics:
spreadsheets, computers in Maths; computers and research.

[R 6] Specific IT PD opportunities for administrators/principals
needed.

LOG: 10:46 am, 3/24/99. : Shifted from address (6). This node indexes
18 documents.
APPENDIX F
TRANSCRIPTS OF INTERVIEWS
Interviewee 1: Canadian Elementary School Principal

Z: I will try and answer your questions.

O: Well, no, they probably won’t be questions. It’ll be more rather coming from you. The studies start from the fact that computers are there, the kids know what to do with them, the group of people who don’t are the teachers. And I’ve looked at – because I’ve been involved in Professional Development for 15 years – all different sorts of model, and we decided – we’ve talked about it – the study’s in two parts. First of all, we had to discover if there was a need for people to have it qualified and that’s come through. About 60% of the teachers. What can we do about it? And my suggestion was

Z: Your context is in South Australia isn’t it?

O: But the context is in South Australia. The most successful model that we’ve had here in South Australia were with people like myself, years ago who did a Grad. Dip. and went back into the schools. as change-agents in the schools. It sort of came down, cascading, in house, situated, people you know about, on-going. All of those good points.

Z: Yes they did work

O: Yes, they’ve gone. They died an unnatural death. Mainly for funding reasons. And so, now, I’m working on the proposal that those same people, like myself, could be interested in the Masters programme. Sent out the survey, 5% said they were not interested, 95% might and 5% said when can we start.

Z: Just like that.

O: So, I’m involving them in a Delphi technique where they’re giving me their comments and we’re sifting through it and coming to some sort of conclusions.

Z: O.K.

O: So, I want some ideas on how do you think we go about solving the problem – that fact that - the missing link – the teachers.
Z: From a technology point of view, I guess first of all, if you don’t even have a computer. Half of those teachers will tell you that first thing, that if they had a computer – and it made a very strong statement to them. Technology is important because it is here. I guess the second part of that is, once they have a computer, well, what do you do with it? Well, what are the personal points? Now, most people have to write. So, how does it become a writing tool? Just before that I back up and save a lot of headaches for 50+ teachers who don’t have any keyboarding background. They use the peck method. I must admit you’re looking at a person – you’ll laugh – taking Grade 10 typing – I hated it. My God, thank God I took it, because like I can sit down and keyboard now.

O: And the fact that we had that 15th century technology where the keyboard was designed to slow you down.

Z: Exactly.

O: Why we can’t have the voice activation or the …

Z: You’ve heard of voice activation. I don’t think voice activation will ever help us with data input. Text, yes.

O: Oh, yes, yes.

Z: Data, I think will always be an issue. And anyway, coming back to the other one. Yes, once they’ve got technology, well then keyboarding needs to be addressed somehow. But once they’ve got keyboarding skills obviously, what are the hooks for me personally? Well, working in education, a management vehicle as a feature, record keeping, as a writing tool for me, as a lesson presentation tool.

O: Definitely.

Z: So you really work on those hooks. Personal hooks first. And then I find once you – and we’re looking at a person who’s self taught. I had no computer training at all. I did it on my own. And once you get into it, you realise, Oh my God, I feel comfortable with this, I think I’ll try something a little bit different, and it’s a sort of a pyramid where it begins to enlarge and all of a sudden you realise, Oh my God will I know it all?
O: Well, how do you – I’d split mine up in two. The knowledge to use the tool, then there’s the wisdom to be able to apply that knowledge.

Z: Yes, that’s a knowledge application thing that what you work out — a framework for kids — the intellectual capacity model.

O: But, if they haven’t got that knowledge, they haven’t got that confidence and competence, there’s no way.

Z: If you don’t understand what the potential of the hardware is, it’s exasperating.

O: Agreed.

Z: If you don’t understand the potential of the hardware, the potential of the software, you’ll never make effective use of it. And that is strictly done through training.

O: O.K.

XX: Hi.

O: Hi XX.

XX: Let’s go to it.

Z: You’ve heard that one before.

XX: I thought I’d pop in and add a comment or two, too.

Z: It’s good to talk to as well.

XX: Yes. Yes.

Z: We are really, a very responsive group.

O: We’ve just welcomed into the room, XX from Victoria, and we’re hoping he might input some ideas too. As part of my doctoral research, Z has agreed to participate in just some questions and answers on PD for teachers. You are welcome to join in the conversation. We’re just talking – we’ve started from the need – and there’s obviously a need – certainly here in South Australia – and I’ve quantified that with a state-wide survey. Now we’re talking about how do
we solve the problem. We’ve proved that the problem is there. We’ve known that it’s been there for years. So how do we go about it? Z is just about to give us some ideas how.

Z: I was just saying that one of the first things, Bruce, is that teachers need computers. That become part of their environment, as part of their life, that of personalising. It’s all those personal things. We’ve talked about email, record keeping and writing tool and so on and so forth. So you’re looking at the personal use of the technology first. And then there’s the public aspect of priority. When you start using it as a public tool. As a means of going about their work. O.K. Without a difference between the personal and public use. It also really differentiates between applications. You get into sharing stuff . . .

O: The sharing model with the classroom units. Oh, your kids were telling me that you were doing the “you beaut” things with KidPix or ClarisWorks or something. They were doing a project on the environment. That sort of sharing of ideas too.

Z: I still don’t have – tend to be very biased towards coaching – the coaching model.

O: Yes. Coaching or mentoring.

Z: Mentoring, and then you transfer that, and that relies on the couple of experts within the building and the stuff that XX –

Z: . Those experts are so valuable, because they’re there. It’s not like you don’t do the admin stuff or the presentation, and I hate that. And it goes on and on. When it hit the one shot, you come back and you’re supposed to remember it all. And no one can do that.

XX: They’re taking it a stage further at Bendigo Senior Secondary where they actually have Image Curriculum areas as well, so they really approach it from a curriculum dimension and the technology.

Z: And XXs point that we don’t just do technology: its the whole curriculum.
O: I’m coming back to – you’ve used the term here the ‘cascade’ model where you know – it’s almost what you’re saying. You’ve got one person who has the knowledge and it trickles down – comes down through to the others. It worked for me. I was in the Faculty of Education and when I went there, not one of the lecturers had used a computer, not one of the lecturers had a computer, not one of the lecturers even referred to computers. Well I’m talking – this is in the last decade. I’m not talking twenty years ago.

XX Yes, precisely.

O: The Dean of the Faculty of Education, when I was recruited, he said at the interview, ‘Oh, I can see no possible future for computers in education,’ and he didn’t. I wasn’t even employed by the Faculty of Education. So, yes, the cycle of ignorance that XX was talking about. So we had many people going out who knew nothing. And not only did they not know the right things, they had this attitude ingrained in them – Well, my lecturers in the Faculty of Education – they don’t reckon this technology is any good. We have to go down the hill to the Faculty of Science – The real problem with PD is that the government structure used to exist where you had the one-day horrors. At least there was some method of giving teachers, but that’s been done away with. And it’s fallen back now on to the professional associations to carry out the role of professional development.

Z: And the other issue is that is talked a bit about by districts when the departments start making certain things like technology, literacy, is making it as a necessary top level

O: Of course.

Z: It is a multiple-choice test. You sit down there and you choose the right answer. From a concept point of view, I like – the concept’s good, it just needs a reshuffle.

O: Unfortunately it’s used by our Masters, to be able to turn around and say, like they are here in South Australia – by the turn of the century, there’ll be one computer for every five children and every teacher will have these basic skills
in IT. Just because you’ve got those skills, are you going to do anything with them?

Z: I think those are the kinds of things that are most startling.

O: Oh no, no.

Z: But what’s happening is you’ve got hiring practices, particularly in North America, is that teachers who are technically OK, are replacing those who don’t.

O: I certainly can’t agree.

B: What has happened is that it’s been - on the agenda as an item which – a range of things that should be in your performance plans and you can’t do them.

O: Ahh.

B: It doesn’t have to be in Performance Plans, but we know that in the regions where we’ve got the data, it’s about 50% of principals that have technology in their Performance Plans.

O: If you haven’t got it, support from above, you will go nowhere.

XX: It’s not surprising, but what it points to is that you know, a critical weak spot in the professional development process. Unless we can get – it seems that unless we can get principals to . . .

O: More leadership and consultant plans

Z: Certainly

O: But you do need the framework because it’s definitely – the in-house model with the coaching, the mentoring, where you’ve got the ongoing support.

Z: Yes. That one-off training, the one blast and!!

O: Yes.

Z: It doesn’t work.
Appendices

O: Thanks Z. That’s just marvellous.

XX: Can I just mention a couple of things before you go..

O: Yes.

XX: So it’s in your tape. Another thing – we talked about professional development as in people helping people. One the of the approaches that we’re keen to develop and it’s got some permutations – is the lateral transfer of innovative science teacher and it doesn’t - you want to train another red hot science and say, either give me something on pollution or give me something to meet this piece of standards framework – roads tested, standards linked, activities, embedded in a form with enough substance to gather the information.

Z: They’re like the templates.

O: Yes, yes.

XX: But not case studies.

O: No, no.

XX: It’s expensive as it’s an on-line interactive thing. I’m just sort of – this is not coaching. This is a planned . . .

O: No, no, no. It’s collaborative sharing and . . .

XX: of the road tested ideas. It can point to software, it can act as kind of software review, it can do all that kind of thing.

Z: So it teaches that on a ned-now basis.

O: And adopted if it’s appropriate for their needs.

Xx: What we hope this will do is actually support the implementation of standards as well. Rather than saying technology is another thing that you have to add to your personal agenda, it’s saying, here is a way of covering the number one agenda, which is standards and curriculum. And, but what I want to mention here, I’m interested in whether you’ve heard other things like that.
Appendices

Z: The whole technology in Alberta is worth looking at as it would be the leading province in Canada for technology.

END OF THIS TAPE;
REFERENCES

This reference section only cites works that have specifically supported the Dissertation.


References


Burgan, O. (1991) ‘All that glisters is not gold’, Paper presented to a Faculty of Education Research Seminar, NTU.


References


References


References


