Implementation of government's computers in schools policy: a case study

Rebecca Hudson
University of Wollongong, rebeccah@uow.edu.au

Recommended Citation

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au
Implementation of Government's Computers in Schools Policy: a Case Study

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

Master of Education (Honours)

from

University of Wollongong
New South Wales, Australia

by

Rebecca Hudson
B.S.E., Maths, M.A., Maths (Honours)

Graduate School of Education
2002
Acknowledgement

The author gratefully acknowledges the support and guidance of her supervisor Prof. Barry Harper.

Thank you to Mr. Richard Leemen, Principal of Elizabeth Macarthur High School, Nareel, New South Wales for his sympathetic support, and to the teachers and staff who willingly took part in this research whose time and cooperation is invaluable in the completion of this thesis.

Most importantly thank you very much to my beloved daughter, Myvanwy, whose assistance in editing this research, moral support and encouragement, this endeavour would not have been possible. Lastly to my sister, Remedios, who encouraged me to pursue this degree.

Rebecca Hudson
# TABLE of CONTENTS

<table>
<thead>
<tr>
<th>Chapter 1: Introduction</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td>Policy Implementation</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>6</td>
</tr>
</tbody>
</table>

## Chapter 2: Literature Review

## Chapter 3: Methodology

- Data Collection and Analysis Design 36
- Sample Population 38
- Methods Used in the Study: 41
  - *A Case Study Research Model*
  - Validity and Reliability of Instruments 47
  - Instruments of Inquiry 63
  - Questionnaires 64
  - Surveys 66
  - Interviews 71
Chapter 4: Report Findings

Teacher’s Survey on Internet Training. (Questionnaire Number 1, Part 1).

Teacher’s Survey After the Implementation of the Use of Internet in the Classroom. (Questionnaire Number 1, Part 2).

Whole School Survey on the Implementation of Computer Technology at the sample school. (Questionnaire Number 2).

Personal Interview with Teachers (Interview Questionnaire).

Chapter 5: Conclusion

Conclusion

Summary

Suggestions and Recommendations

Bibliography:

List of Appendices
ABSTRACT

The use of information technology in teaching and learning is being introduced in schools widely at an accelerated rate. In the case of New South Wales, this is addressed through such devices as the Governments Computers in Schools Policy, as approved by the NSW Government and funded by the Treasury from the Curriculum Directorate (Policy Document, Connecting all NSW Government Schools to the Internet, p.3, 1996). One of the key strategies relates to the significance of connecting the government schools in New South Wales to the Internet. The policy document states that the Internet project aims to connect students, teachers and school community members to the global community and the information resource called the Internet. The use of the Internet is supposed to provide enhanced teaching and learning opportunities for teachers and students alike.

This thesis addresses a range of issues associated with wholesale adoption of computer technology and, in particular, the connection of all state schools to the Internet. Such issues include access by students and teachers, support of learning and teaching in the curriculum, provision of training and development as well as security and technical support (Policy Document, Connecting all NSW Government Schools to the Internet, 1996, p. 4). At the time of this study, access to the Internet has been piloted in 66 schools from six districts across the State of New South Wales, and the pace is accelerating in all other states of Australia. Thus, one of the objectives of this thesis is to evaluate the
success of implementation of school-based policies on the use of computers and the Internet; the main focus is on the effectiveness of implementation. The purpose of this study is to establish the degree of effectiveness in the implementation of government policies pertaining to the wholesale introduction of computers in a school. The key issues to be investigated are:

1. What are the implementation strategies that exist in Elizabeth Macarthur High School for gaining acceptance in the introduction of the Internet Policy?

2. How does teacher training in the Internet enhance learning and teaching at Elizabeth Macarthur High School?

3. How does the school executive implementation process (support) impact on the successful implementation of the Internet Policy at Elizabeth Macarthur High School?

The thesis presents conclusions, formed on the basis of questionnaires, interviews and field observations. A case study, dealing with the entire process of introducing, establishing and consolidating computer technology in a government school in New South Wales (Elizabeth Macarthur High School) is presented in substantiation of the thesis objectives. The thesis concludes with a range of recommendations pertaining to the successful implementation of a viable computer in schools policy.
GLOSSARY of TERMS

Implementation

Implementation of technology, within the school context, means putting technology to use by the deployment of various different strategies to enhance teaching and learning activities of the school.

Internet

The coining of the term Internet goes back to the days of Cold War, when a network task group within the U. S. military command, code-name ARPA, was charged with the task of developing a set of rules (or protocol) for computer communications. The envisaged framework was to be known as Military Academy Internet. The term Internet distilled from that is now universally understood to mean a global network of computers as a major tool of information technology. In education, the Internet offers exciting opportunities as an effective teaching tool, the use of which can help students to develop communication, research and information management skills. As an unparalleled resource, the Internet can help to develop their logical thinking, artistic and creative ability as well as offering enormous time-savings in locating, accessing and processing information.

Policy

Policy is a plan of action adopted by a person, group or government.
Technology

The term technology can be used to mean different things. It might mean innovation, advancement or invention. Technology is not limited to machinery only; it can comprise devices or resources such as visual aids, cameras, videos, telephones, fax machines, multimedia, videoconferencing and many more.

As J. Hughes (1994, p.229) asserted, “technology is often seductive and when that technology merges separate media-video, audio, text, graphics, animation-and claims to combine an appeal to multiple senses with the engaging power of sensitivity, that seduction may become hard to resist for an increasing cross-section of groups involved in education”.

Chapter 1

INTRODUCTION

1.1 Introduction

A government school under the Department of Education and Training in New South Wales, Australia was selected as a site for the study in this research.

Information technology is now generally recognised as a powerful tool in enhancing the effectiveness of learning and teaching. It helps students to develop skills of inquiry, research, problem solving, analytical and logical thinking as well as enhanced aptitudes in the use of graphics. Such skills are essential in keeping up with the swiftly changing technological realities of contemporary life. Thus, schools must address the use of information technology seriously in the classroom. Experts attribute the tremendous surge in the acquisition of information technology devices to sweeping changes both in the workplace and at home, where facsimile machines, networked computers and electronic mail have already altered daily routines. As a result, it seems logical that business officials, public policy makers and parents look to educators to pave the path into a high-tech future. Besides giving the obvious economic reasons to keep pace with the demands of a rapidly changing economy,
techno-enthusiasts have billed the new machines as energetic tools for making
learning and teaching for students and teachers more productive and engaging
(Sandholtz, Ringstaff and Dwyer, 1997, p. XI).

The above argument could contribute to governments' push to provide schools with
the tools of information technology, including the Internet access as a key strategy.
The latter provides opportunities for communication and the interaction between
teachers and students across Australia and with the rest of the world.

1.2 Background

Computers are rapidly becoming an indispensable part of education; they are being
introduced to schools as a teaching, learning and communication tool with the
potential to assist both students and teachers in many facts of learning and teaching.
The use of technology in the learning process is being introduced in schools with the
support of government policies; in the case of New South Wales, Government's
Computers in Schools Policy (Policy Document, Connecting all NSW Government
Schools to the Internet, 1996). One of the key strategies proposed in this Policy is that
of connecting all New South Wales government schools to the Internet. The policy
document states the aim as being to connect pupils, teachers and school community
members to the global community, and information resource called the Internet, with
the objective of enhancing teaching and learning capabilities by providing access to sources of information otherwise unavailable.

When the Victorian Government launched its Information Technology and Telecommunications Policies and Guidelines, the "Internet Policy" was a major policy component. This policy stated that Departments in Victorian Governments should adopt the use of the Internet to improve the Delivery of customer services, implying that the Victorian Government had identified Internet as a means of improving both the efficiency and quality of service to customers. The State Communication and Information Strategic Plan (SCISP) outlines the Queensland Government's direction with regard to communication and information and aligns Internet use with the Government's broader directions in service delivery and information technology and communications. This key document is being developed with input from agencies, industry and community organisations. (http://www.egov.vic.gov.au/pdfs/is26.pdf, 20 August 2002, pp.2-8). The Policy stipulated that:

- any unclassified Government-held information be made accessible as practicable;
- quality service be improved by bringing services as close to the customer as possible;
- services be advertised widely, and
- customer self-help is encouraged so as to decrease the cost of service delivery.
The Policy identified benefits of using such services: improved access to government information by customers; accelerated research; development or recovery time through immediate access to expert help; product and best practice information; cost reduction in collaborative work, and access to timely and relevant information for Government.

Another example of such a policy is given by the “Call to Action for American Education in the 21st Century” of the then President of U.S.A., (Bill Clinton), http://www.ed.gov/updates/PresEDPlan/part11.html, pp.1-4 (last updated, February 17, 1997). In his speech the President is quoted as having said: “...Technology—the World Wide Web, computer aided design, word processing, data processing, electronic transfers—has become an engine of our economic growth and has fundamentally changed the ways we learn, how we do business, and the skills of the students in America to flourish in the world of work...Technology literacy—computer skills and the ability to use computers and other technology to improve learning, productivity and performance—is a “new basic” that our students must master...Technology also encircles education.” In 1995, the U.S. President had challenged the nation’s parents, government, and community and business leaders to work together to ensure that all children in America are technologically literate by the dawn of the 21st century economy. He postulated four pillars of his technology literacy agenda (Technology Literacy, p.2), viz.
1. Connect every school and classroom in America to the information superhighway;
2. Provide access to modern computers for all teachers and students;
3. Develop effective and engaging software and on-line learning resources, and
4. Provide all teachers with training and support they need to help students learn through computers.

1.3 Policy Implementation

Implementation is considered to be a structural part of policy making, although it may have different meanings for different institutions such as government departments, statutory authorities and business organizations. Evidently, as with any other new policy, the implementation phase of any such bold policy raises a number of issues, and the spectre of teething problems; in this case relating to student and teacher access, support of teaching and learning in the curriculum, training, development, security and technical support. It is essential those potential problems are considered in advance of implementation itself and that appropriate procedures are defined clearly. In the case of New South Wales, the key strategies in the government policy are:

1. Connection of all schools to the Internet,
2. Training and development of teachers in the use of computers within key learning areas,
3. Providing additional computers to schools and additional technology support to teachers, students and schools, and
4. Developing curriculum support materials to enhance teaching and learning in all key-learning areas.

The policy aims at increasing the impact of computers in education and connecting all NSW government schools to the Internet by December 1996 (New South Wales Department of Education and Training, Computer-Based Technologies in Mathematics KLA, p.3). The objective is to provide each user with a personal computer with networking capability, Internet software, and a modem to connect to the Department of Education and Training’s Internet provider and training in the use of the Internet. In 1996 the project has been piloted in 66 schools from six districts across the state.

1.4 Purpose of the Study

The objective of this thesis has been formulated on the basis of the key strategies of the policy document on computers and schools mentioned above. The author selected a government school in New South Wales as a case study. This thesis aims to investigate the effectiveness of the implementation of government policies pertaining to the wholesale introduction of computers in schools. Specifically, the key questions of this research are:
Q1. What are the implementation strategies that exist in the school selected for the study for gaining acceptance for the introduction of Internet Policy?

The associated sub-questions would be:

a. Is there a Technology Plan that exists within the school?
b. Is the Internet Policy fully implemented in the sample school?
c. Is the whole school (students, staff, teachers and parents) aware of the need for an Internet in the sample school?

Q2. How does teacher training in the use of the Internet enhance learning and teaching in the sample school?

Q3. How does the school executive implementation process (support) impact on the successful implementation of the Internet Policy in the sample school?

In anticipation, the findings and conclusions obtained from this inquiry may assist those involved with the use of computers in schools, policy makers, school leaders, teachers, students and parents.
1.5 Delimitations and Limitations of the Study.

This study included teachers, department heads and staff of Elizabeth Macarthur High School, Narellan New South Wales. There was 70 full time staff during the time of the study. The teachers and staff who participated in this study were representatives from across the faculty areas such as Mathematics and Computing, English, Science, Technological and Applied Studies, PD/H/PE as well as a Career Adviser, Librarian and School Counsellor. The study is only limited to the teachers, staff and department heads who agreed to participate in the Internet Training and interviews in the school year 1998, term 1 for three consecutive weeks. The researcher administered 4 sets of questionnaires to participating teachers. The number of teachers participated is shown below.

- Teacher's Survey on the Internet Training. (Questionnaire Number 1, Part 1). (n=11).

- Teacher’s Survey after the Implementation of the Use of the Internet in the Classroom. (Questionnaire Number 1, Part 2). (n=11).

- Whole School Survey on the Implementation of Computer Technology at The school selected for the study (Questionnaire Number 2). (n=16).

- Personal Interview with teachers who had consented to contribute to the research objectives of the thesis (Interview Questionnaire). (n=5).
1.6 Importance of the Study

To improve the teaching methodology of integrating technology in the classroom and to enhance the students' learning through using technology tools, there are certain problems the schools should address. One of these problems is the lack of knowledge of teachers have in using these tools for classroom teaching. Teachers need professional development in computer technology supported by school leaders. The researcher, as a mathematics and computing teacher made an investigation of this problem. She believes that the result of this study may assist teachers, school executives, students, parents, educational leaders, policy makers and governments in planning and implementing computer technology programs in schools.

1.7 Outline of the Study.

The remaining sections of the thesis are composed of: (a) Literature review – studies in Australia and overseas in the area of computer technology and literacy. This chapter is divided into 3 major headings: teaching and learning, technology literacy and technology policy implementation, (b) Methodology- includes sample population, methods used in this study, validity and reliability of the instruments, instruments of inquiry, questionnaires, surveys, interviews and collection of data table, (c) Report Findings –represents discussion and analysis of results of the 4 questionnaires
administered to the participants (d) Conclusion – a summary of the report findings linked to the research questions in chapter 1. This includes the summary, suggestions and recommendations, (e) Bibliography – references and sources of information used in the study and (f) List of Appendices – these include 4 questionnaires and other documents used in this study.
Chapter 2

LITERATURE REVIEW

The critical importance of information technology to education is being increasingly recognised around the globe. The following represents a glimpse of this general recognition.

Several studies and researches have been conducted into the use of computer technology in the classroom, teaching methodology in the use of the Internet, the implementation of technology policies in small scale and wholesale adoption of such policies, school leadership embracing technological change in schools and professional development and teacher training in the use of computer technology. The researcher made a survey of these various studies, both in Australia and the United States of America (U.S.A) not only to acquaint herself with the previous findings on similar and related studies but more so to provide her with the proper guidelines in effectively pursuing her study. The researcher uses these studies as a basis to answer the research questions in chapter 1, p.1.

The following researchers cite cases of computer usage in schools. These cases illustrate the use of Web-based lessons in teaching subject areas, technology training
and school Internet connection. Also examined is the broader paradigm of technology implementation, the interaction between school leadership and management and the wider community, particularly technology corporations and businesses. These reports show that the successful implementation of technology policy in schools is dependent on the dynamic interaction between the wider community, school leadership and grass roots implementation.

The studies are categorised into three broad areas such as: teaching and learning, technology literacy and technology policy implementation. The latter is divided into three sub-sections under the headings of professional development and technology training, teaching methodology and school leadership.

2.1 Teaching and Learning

The following authors conducted studies to enhance teaching and learning using computer technology in the classroom. The authors’ common theme is based on the use of computer in teaching, access to computers, technical support to teachers and using software and hardware.

Downes (1991, p. 49) argues “teachers need a strong philosophical framework in order to plan and implement relevant and effective computer-based learning experiences for the children in their classes.” She adds that “the use of technology needs to be considered in relation to the major influences which have an impact on children’s lives; the technology alone should never guide the planning process.”

- Computers as a topic of study.
- Computers in support of learning with task-specific programs.
- Computers in support of learning with generic, content free programs.
- Computer supporting specific needs through component software.
- Radically pedagogical changes due to use of computers in teaching and learning.

These stages must be seen as being implicit in the successful materialisation of a computer-based teaching and learning facility.

Laurillard (1993) in McNaught (1996, p. 385) describes a teaching and learning model containing the four aspects of discussion, interaction, adaptation and reflection. Laurillard argues that the use of multimedia can enhance the teaching-learning process effectively by facilitating conversation between pupils, teachers and teaching materials. The soundness of Laurillard’s argument is difficult to challenge.
Cunningham (2001, p. 41) describes the U.S. federal government's massive program to connect every school to the Internet, where school districts are spending a large amount of money on computers, software, and technical support. He further indicates that even if support from the government for technology implementation in the schools is on its way, many of America's teachers are unprepared to use computers in their classrooms. His paper points out that according to a 1999 study, about 1.3 million of the nation's 3 million elementary and secondary teachers feel only 'somewhat' or inadequately prepared to integrate educational technology into their teaching. Cunningham stressed the use of computers in schools, ready access to computers and the Internet. However, he emphasized the need for teacher training in technology, the effectiveness of using technology in the classroom and technology support in the classroom. He asserts that mere financial assistance for the Internet connection to schools is inadequate. Rather, successful implementation demands comprehensive professional development that facilitates the necessary changes in teaching and learning. His study clearly outlines that long-term and structured teacher training should occur in order to equip teachers with technical knowledge.

Cunningham's study is a comprehensive one and addresses the positive aspects of computer use in the classroom when teaching students. Computers simulate real-world experiences, can also be productivity tools, enabling students to gather and learn from information more efficiently, and can serve as electronic workbooks, delivering instruction at a pace individualized for each student. Using computers at a higher level provide the virtual reality. The study argues that students must have ready access to computers in the classrooms requiring not only more computers, but
also more complex technical support as well as increased familiarity with the computer and software. For computers to be put to effective use, teachers must also alter their curricula, so that the simulation is not just an "add-on" but also a complement to their larger instructional goals. It is also evident that electronic workbooks do indeed improve students' basic skills, enabling them to participate in higher levels of education as a result of the study. The vision of computers as productivity-enhancing mind tools is more difficult still as it requires transforming classrooms into information-rich workrooms, in which students use the Internet as a huge repository of real-world data, images, text, and other resources. Some of the associated dilemmas in Cunningham's study are: many teacher training institutions fail to use computers effectively to train teachers and even if teaching programs are computerized most teachers will be unable to integrate technology into the curriculum in educationally significant ways and perform on higher-level thinking tasks. His concluding remarks assert that a mindless pursuit of educational technology for its own sake is not needed. However, the educational effects of computer technology use and the substantial changes in schooling are factors that teachers should address. As was clearly demonstrated earlier (Cunningham, 2001, op.cit.), it may take several decades when certain issues in technology implementation in schools could be understood to make choices on a national level. Economic forces, rather than educational ones, will probably have already determined how computers will change society and our schools.
The above studies identify issues associated with computer technology use in the classroom.

2.2 Technology Literacy

Computer skills and technical knowledge is a must for every young and old person in everyday existence. In order to cope with our technologically advancing world, people must be computer literate. This is particularly important for our young generations. The authors below looked at the merits of technology literacy and what it can do for the future generations.

"Technology Literacy for the Nation and for its Citizens" by Thomas and Knezek (http://www.iste.org/publish/whitepaper.htm, 1997, p.1-7), a document prepared for the Intel Corporation by the International Society for Technology and Education, postulates that “while the world economy depends increasingly on electronic digital technologies for collecting, processing, manipulating and using information, our school curricula continue to address the mathematics and science of out-dated tools”. The paper identifies four major issues calling for action, viz.

- Technology literacy for success in a global economy.
- Understanding of technology literacy.
- Achieving technology literacy among school-age learners, thus developing a blueprint for change, as well as among adults, establishing an infrastructure for support of technology literacy.
• Policy initiatives for a technology literate nation.

The four issues identified by Thomas and Knezek (op. cit.) are significant in implementing technology initiatives in schools. In that sense, school must not only use computers to enhance teaching and learning, but must also use them as vehicles to enhance awareness of technology and of its role in the contemporary society, thus helping individuals to acquire technology literacy.

Another issue closely related to technology literacy is that of access and equity. Downes (1997, p. 9) presented the results of a number of recent studies that investigated different aspects of computer use in Australian households. The findings of these studies provide Australian educators, for the first time, with some data upon which to base their thinking about the changing lifestyles of children they teach. She adds that teachers need to develop strategies and processes so that all children in their classroom benefit from extra skills and understanding they bring to class. As well, they need to consider a range of strategies for developing skills and understanding in children who do not have access to a computer at home. She recommends that the following issues be seriously addressed by the teacher when integrating computer technology in the classroom:

• Creating classroom culture where all children can participate in and benefit from all teaching and learning activities, including those using new technologies.
- Developing children’s attitudes, values and skills that enable all to work both independently and cooperatively with their peers, sharing resources as needed.

- Organising teaching and learning experiences in ways that ensure all children have access to or use of necessary resources, and participate in all aspects of all tasks.

- Finding out what resources children have access to at home and how they use them for leisure and school-related activities.

- Allocating time, particularly for students who do not have access to computers, outside the classroom.

- Designing learning and teaching activities and management regimes, which maximise children’s sense of control over the use of school’s computer.

- Creating and nurturing links between school and home.

3.3 Technology Policy Implementation

The authors below described policy implementation in the use of technology as an integral part in achieving successful outcomes when teachers use computer technology in the classroom. In one of the studies below, it showed that community and school collaboration was a joint venture of the technology director and the secondary education and training. The following studies represent an overview of this section.
In Debrenceny and Ellis (1997, p. 149), preconditions for successful implementation of a university's plans are analysed in the context of critical success factors (CSFs) framework. Ten CSFs are identified, including those related to curricula, funding, change in management of learning, matching of student resources and institutional infrastructure spending. Some of the CSFs considered relate to technology-based innovative teaching approaches, management and partnering, and to matching learners' competencies to institutional resources, viz.

- Technology-based innovative teaching approaches

In this case, the university has set a course, which is heavily dependent on technology. It has not only stressed the role of information technology in the University Plan, but has also heavily invested in a Technology in Learning and Teaching Unit (ibid. p.155).

- Management and partnering

The geographic distribution of the University’s activities and the ubiquitous nature of information technology mean that partnering will be an important element of the change management process (ibid. p. 157).

- Matching student resources and competencies to institutional resources

The university is not able to invest in all the technology needed to deliver the types of programs envisaged by the Plan. Furthermore,
whatever technology is available will be at the disposal of the students. This will include the use of computers, CD-ROMs, modems and Internet connectivity. An important CSF will be the matching of students’ access to technology and their ability to use it (ibid. p. 158).

Such concerns relating to critical success factors in the process of implementing an information technology base for a higher education institution are also clearly relevant to the implementation of policy objectives guiding the use of computers in school.

Goodridge (2000, p. 54) examines the role of the community in providing support for computer and technology implementation in rural schools. Such support included hardware and software acquisition and technology training of teachers in schools, whilst still requiring policy implementation and management of schools. She describes the school as,

“...Struggling to offer students adequate technology, tapped local, federal and state grants as well as business partnerships, universities, non-profit organizations and volunteers, including employees of Nortel Networks who offered to spend weekends training teachers in technology. Bunter-Stern now has three computer labs and two full-time teachers to train the 600 students in computer literacy. The school is still struggling, and much of the equipment is already outdated. It hopes for assistance from the state government, which recently passed an initiative to deploy broadband Internet access in rural areas. IBM is also donating resources and personnel.”
The study shows the collaboration between the community and the school. The policy implementation of technology in Stem-Stem High School was a joint program of the director of technology and secondary education, the local government and business industries. There was evidence of technology support, hardware and software acquisition, and technology training for teachers. Support for the technology implementation in this school was evident in federal and state grants, business and individual donations, business partnerships, local universities, non-profit organizations and volunteers. The technology program included weekend technology training classes for teachers by employees of Nortel Networks Corp., and gifts of computers and printers to the high school. Although external support in funding is evident, the task of funding technology to bridge the digital divide in the state rests with school administrators. The leadership and management of the administrator are crucial in the implementation process of the technology program.

Goodridge also noted that:

"The job of staffing the computer labs at Stem-Stem High School and the 12 other schools in Granville County rests on the county's director of technology and as a result, Stem-Stem boasts three computer labs-two outfitted with PCs, one with Apple Macintoshes-and two full-time computer-literacy teachers to train the 600 students. Students take classes in basic computer skills and also use technology in traditional classes such as English and social studies.

The salaries of the computer teachers were funded by the local government while Nortel outfitted one lab with donated used computers. Net Day Corp., a local non-profit organization,
recruited volunteers from the IT community to install and maintain the necessary infrastructure for Internet access.

The business-technology class also covers telecommunications and Internet concepts and prepares students for a statewide computer-literacy test taken in the eighth grade. Established as a high-school graduation requirement last year, the test guarantees a rudimentary understanding of computer skills. Stem-Stem touts its 90% passing rate among its students vs. the state's rate of 75%. Neighbouring Wake County, the home of Research Triangle Park, reports that 81% pass the exam”.

Despite the success of implementation of the technology program, hardware acquisition would be a problem because computers can be outdated and equipment and technology support and maintenance would be a continuous process.

Russell and Russell (1997, p. 584) conducted an investigation into the use of cyberspace in the curriculum. The study deals with the adoption of computer technology in Australian schools. They said that recent research on computer use has identified trends in the evolution of a cyberspace approach to classroom-level curriculum development. The paper argues that while there are strong pressures from outside the school for a cyber spatial approach to planning the school curriculum, authors identified concerns that resistance by teachers and administrators may retard its introduction. Their paper is a comprehensive study in the use of computers in Australian schools.

The use of the computers and the Internet in classroom teaching offers a great potential in the learning capabilities of students. Societal expectation such as parents, the wider community in business and industries has prompted schools to keep up-to-
date with the fast growing area of information technology. The study made by Russell and Russell (1997) reflected the expectations of the business sector on teachers and high school leaders to deliver the “new basic”, computer literacy to its full potential. Teachers are expected to be well equipped with computer know-how when facing a classroom. They also expect school leaders to be computer literate. However, such as the one conducted by Russell and Russell (1997), demonstrate that teachers still lack the confidence and have little training in the area of computer technology. As students use more and more computers in their homes, parents expect the schools to provide the same facilities that they have at home. Russell and Russell believed that teaching and assessment practices in the integration of computer tools are very effective in some cyberspace curriculum. According to the authors, there is evidence from the United States (Becker, 1991), which supports the suggestion that, in America, as in Australia and other developed countries, computers have not always been used in schools to their full potential. There is also evidence that when computers are used regularly for normal classroom use students are likely to be more motivated and teachers will be pleased with their achievements (Finger, 1995).

The potential of regular computer use in the classroom could enhance learning of students, as they are motivated using hands-on activity.

Russell and Russell presented some statistical trend in the use of computers in Australian setting. Figures are given as follows:

“A select review of recent published findings on the use of computers in homes reflects the issues facing teachers. Over 23% of all Australian households use a computer regularly, with
the percentage expected to increase dramatically. (Australian Bureau of Statistics, 1994). Coupled with this is the huge increase in the number of interconnected computers. Increases of 400% have been reported in Australia over the last three years (Employment and Skills Formation Council, 1995) with 50,000,000 user linked around the world, on nearly 5,000,000 computers. Students readily adapt to electronic as well as non-print media using them as a matter of course in their homes (Downes, 1995; Sachs, Smith and Chant, 1990; Sachs, Smith and Chant 1991). Shears (1995) has found that adolescents regularly use a diverse range of media for information when completing homework tasks” (p. 584).

As a summary, Russell and Russell made a concluding statement:

“While there are significant problems to be resolved before a cyberspace curriculum can be successfully implemented in many schools, the worst alternative which educators can choose is to implement a model which assumes that all the problems of a modem education system will just go away.

While elements of this recipe may still be appropriate, today's students need a plurality of approaches, flexibility of pedagogy, and teachers willing to implement a range of literacy.

There is a danger that some educators will respond to the need for changes in pedagogy required by a cyberspace curriculum by only making superficial and cosmetic changes to their teaching and assessment procedures” (p. 584).

They argue that radical changes need to be made to classroom pedagogy, which includes abandoning paper-based assessment of student work and using the computer as an integral component of the core curriculum.

The study by the above authors, Russell and Russell covers a large spectrum in computer technology implementation in Australian schools, including of cyber spatial
approach to planning the school curriculum. Cyberspace curriculum could be successfully implemented in many schools, as students are likely to be more motivated in the regular use of computers in the classroom. Teaching and assessment practices in the integration of the computer could be enhanced if teachers have adequate technology training.

3.1 Professional Development and Technology Training

One of the key questions of this inquiry is how does teacher training in the use of the Internet enhance teaching and learning? The studies made by the authors below addressed the acute need for teachers to be technologically trained to embrace a teaching methodology that will cater for the needs of children and the whole school community. These studies delineated their findings below.

The Report on Computer Proficiency for Teachers by the Department of Training and Education Co-ordination, New South Wales, (June 1997, p.5) points out that teachers need to develop skills, which will enable them to maximise the use of computers as a teaching resource to enhance student learning and in preparing pupils to face the challenges of a high-technology society, in which lifestyles, attitudes and skills are challenged daily. For this to be accomplished, teacher education programmes and professional development programmes for practising teachers need to focus on the provision of an understanding of the application of computer knowledge, and
of the basic and more sophisticated skills associated with computer proficiency. The report pays special attention to the following aspects:

- Competencies required for the beginning teacher.
- Current practice in teacher education.
- Current teaching practices in schools.
- Current state system programmes for teachers.
- Implication for resources, social justice objectives and teacher mobility.

David (1996, p. 237) argues that the evolution of a unique public-private partnership, as exemplified by the Apple Classrooms of Tomorrow (ACOT) initiative, has tackled the biggest challenges facing education reform. The history of ACOT mirrors the pattern of recent reforms in education: introducing an innovation from the outside, discovering that teacher knowledge and school structure are major influences in implementation, and then confronting the fact that most models of professional development for individual and organisational change are seriously inadequate. David asserts that one overarching lesson from the original ACOT classrooms is this: to help teachers incorporate technology in ways that support powerful instruction requires an array of professional development experiences. This is quite different from traditional workshops and how-to training sessions. Rather than focusing on technology per se, these requisite experiences must focus on
changing pedagogical beliefs and practices, introducing technology as and when appropriate (ibid. p.238).

David’s observations are pertinent in the sense that use of information technology on its own without an acute focus on pedagogical aspects, and without serious endeavours for adequate professional development, is bound to fail to produce the outcomes expected from its adoption.

Khirallah (2001, p.38) discusses the issue of digital divide in American education. She identifies socio-economic factors as the root of this divide. Disadvantaged school districts tend to be unfurnished for teaching computer skills, have obsolete equipment and poor Internet connection. She describes the situation as follows:

"The school population is 99 percent African-American and 1 percent Hispanic, with 40 percent from families that live below the poverty line. The school is nevertheless a private institution with a strong track record of upwardly mobile graduates; nearly every student receives financial assistance. Surveys show that corporate IT departments and technology firms are concerned about the digital divide and its impact on future staffing needs, but educators say the average CIO does not have time to think about long-term strategies. HP, which has engaged in many educational initiatives, but is frustrated that the number of kids pursuing engineering studies is not growing. Cisco Systems notes that virtually every job in the future will require a basic understanding of IT. Some non-technology companies, such as State Farm
Insurance, are also providing funds and volunteer labour to disadvantaged schools. Many argue that the cultural gap between business and education is the biggest" (p. 38).

The study is a collaboration of business industries and the school. The companies involved in this comprehensive technology initiative are: Hewlett Packard, Cisco Systems, Cincinnati Bell and State Farm Insurance. Hewlett Packard, which has engaged in many educational initiatives, wants to attract children to science and engineering and into solid technology careers. The issue is even broader for Cisco Systems, which also has digital-divide initiatives in place. It's not just the IT workforce, but also the networking vendor's VP for strategic policy. The companies are aware that virtually every job in the future will require a basic understanding of IT; this is the rationale behind their willingness to do their part to get technology to the young people. Their belief is that educated workforce is critical to adapt to the Internet economy. Cisco offers the technology program in community colleges, adult learning centres, juvenile detention centres, and even homeless shelters. In addition to participating in a computer-donation program with its communities, the State Farm Insurance Company has established policies to promote technology know-how in disadvantaged areas. A recruiting and hiring analyst runs an eight-week summer program designed to integrate technology into schools and to meet state education objectives. Two teachers and 13 students meet at company headquarters each year.
The release of an employee from the business industry to assist teachers is one of the implementation strategies used. The employee to train teachers could become familiar with adolescent learning and psychology, and learn how the school system actually works. After-school programs were also evident. A long-term strategy is required in order to initiate these strategies.

3.2 *Teaching Methodology*

The emergence of computer technology tools in pedagogy enables the role of the teacher/instructor the shift from a traditional role to the role of a facilitator, mentor and learner. The authors below looked at issues such as: individualised instruction, student-centred learning, constructivism and the use of web-based resources or the Internet in teaching. The findings of these authors can be significant to this inquiry.

Harper and Hedberg (1997, p.2) argue that recent curriculum documents in many western countries, and in particular in Australia, emphasise the skills of investigation, reflection and analysis to generate, or refine, knowledge. They point out that the integration in education of information technology offers teachers unique opportunities to individualise instruction, place learners in open-ended student-centred investigations, and for instructors to shift from their traditional instructor role to the role of a mentor and co-learner. They also underscore the view that such developments are in parallel with the push
for renewal, will allow for the representation of ideas in many different media forms through information and telecommunication technology, and specifically computers, into the educative process.

Brown (1998, p. 107), in “Generic Class Management Strategies for an Education Lecturer in Information Technology”, reasons that World Wide Web helps ensure smooth class organisation, effective communication with students and appropriate use of past resources to understand the skill-based design tasks set. The author asserts that, when students are presented with a well organised framework with which to access the resources and are shown examples of completed tasks, they have every opportunity to demonstrate what they know and what they can do, provided that you allow them to express their knowledge in an appropriate medium.

Bull, Bull, Dawson and Mason (2001, p. 50) examine the use of web-based resources in a school environment. Their study focuses on evaluating and using web-based resources in K-12 curriculum. According to the authors, the World Wide Web is a relatively well-known phenomenon and many K-12 teachers are still refining methods for taking advantage of the resources that the use of the Internet can offer. They said, “a recent assignment by one high school English teachers suggest the ambivalence that teachers may have about both the promise and pitfalls of these resources. Many materials on the web have not undergone any type of editorial review”. Their paper also addresses issues like: many potentially valuable resources may only be available on the
web and placing a limit of one web citation per student essay is one method of addressing his dilemma; teaching students to appropriately evaluate and integrate web resources into their research papers would provide lifelong skills; the number of web resources will increase throughout their careers and many encyclopaedias, reference works, and guidebooks are no longer published in printed form.

The authors recommend a five step-process that could help to find information on the web.

**Identification of Potential Resources**

Two general resources for locating resources on the web are readily accessible: mechanical search engines and virtual libraries and directories containing references and resources compiled by human curators.

**Evaluation of Appropriate Resources**

Search engines are useful as a starting point for a survey in the Internet. Their chief advantages is that search engines can generate far too many references to review, and the relevance and reliability of these resources is often suspect. Boolean terms can be used to narrow a search.

**Integration into the Research Paper**

It is not the web per se that makes sources suspect or unreliable; it is the editorial review versus lack of editorial review.
Citation of the Source

Student engaged in research in specific content areas would also need guidance on specific resources in each content area. Although librarians can assist, it ultimately becomes the responsibility of the teachers to be familiar with their resources in their content areas.

Verification by the Instructor

Once teachers have identified web resources, it is important to teach students how to evaluate their potential reliability and accuracy. Evaluation methods include: authority, domain, and internal and external consistency (p. 50).

3.3 School Leadership

One of the key questions in this inquiry is how does the school executive support impact on the successful implementation of the Internet policy in the sample school? The studies conducted by the authors below have some significance to this research question. Their findings pointed out that technology policy implementation can be best achieved through the leadership and management of school leaders. They also added that technology support and whole school involvement are important.

Implementation of school policies could not work effectively without the leadership and management of school leaders. This is true in the case of
technology policy and implementation in any school setting. Although principals play a crucial role in the organisational structure and management of a school, it is also important that the school staff and teachers participate in the planning of school programs and policies. Teachers should be involved in decision making and implementing such policies and programs. This is evident in Peterson and Solsrud's (1997, p.105) study on leadership in restructuring school. They recommend consideration of six themes, which should be weighed before restructuring. The authors added that principals play important roles in restructuring but should let other staff take the leadership. The building of a smooth principal-staff relationship requires a sharing of thoughts about the school and a participation in power and decision-making. Teachers should be consulted before improving teaching methods.

Others have made reference to logistics problems arising from a lack of technological know-how. In the case of the study made of ACOT (Sandtholz, Ringstaff and Dwyer, 1997, p. 155), "unlike the ACOT teachers, most participating teachers did not have on-site technical support and found that technical difficulties impeded their abilities to implement what they had learned at the centres". Participants’ lack of basic technical knowledge, coupled with malfunctioning of computers, caused problems at times. It was observed that many teachers lacked trouble-shooting skills and few had access to manuals that might have enabled them to solve problems. Of additional
concern was the time taken for repairs when malfunctioning equipment had to be sent out: sometimes it took months before being returned.

In summary, the review of literature reported here reveals the following pertinent aspects:

- The ingress of computers and information technology in all facets of life, including education, is unstoppable.

- There is an acute need for technology literacy of teacher, students and school leaders so as to exploit the full potential of opportunities offered by use of computers and information technology.

- Schools have an intrinsic obligation, indeed a mandate, to include technology literacy in its educational objectives.

- In order to fulfil this mandate, schools need to be equipped with the necessary infrastructure and technical support.

- Along with this, classroom management and teaching strategies need to change so as to take advantage of the potential offered by technology. This includes individualised instruction, student-centred learning, self-
assessment, peer tutoring and collaborative teamwork amongst pupils as well as between pupils and teachers.

- The use of emerging tools of information technology in school, such as the WWW, e-mail, newsgroups and bulletin boards, simulations, word processing, spreadsheets, databases and graphics offers real opportunities for enhanced teaching and learning. Options include on-line tutorials, WWW-based subject offerings and remote assessment.
Chapter 3

METHODOLOGY

The purpose of this study is to establish the degree of effectiveness of the implementation of government policies pertaining to the wholesale introduction of computers in a school. The methodology is based on the use of a range of instruments of inquiry described in the following sections, the findings of which have been analysed to form the conclusions presented later in the thesis.

3.1 Data Collection and Analysis Design.

Table 1A includes the research questions and questions from the questionnaires as responded by the sample study, which corresponds to the research questions. Policy Documents of the School, Interview Questions and Questionnaires were used as sources to answer the research questions. The research questions and answers were presented in the succeeding chapter, Chapter 4.
<table>
<thead>
<tr>
<th>Research Questions</th>
<th>School Documents</th>
<th>Questionnaires</th>
<th>Interview Questions</th>
<th>Analysis/Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. What are the implementation strategies that exist within the school selected for the study for gaining acceptance in the introduction of Internet Policy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Is there a Technology Plan at the sample school?</td>
<td>Technology Planning Schedule, Technology Plan Implementation 1998</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the Internet Policy in the sample school fully implemented?</td>
<td>Interim Internet Policy, Access to Internet Policy, Internet Code of Behaviour Agreement</td>
<td>Q2, question 1</td>
<td></td>
<td>Table 1, Q2, Table 2.q2, Table2.aQ2, Table2.b Q2 as framework for analysis</td>
</tr>
<tr>
<td>3. Is the whole school aware for the need of Internet Policy at the sample school?</td>
<td>Internet Course Training Document</td>
<td>Q2, question 2a</td>
<td></td>
<td>Table 2.a Q2, Table2.b Q2 as framework for analysis</td>
</tr>
<tr>
<td>Q2. How does teacher training in the Internet enhance teaching and learning at the sample school?</td>
<td></td>
<td>Q1, Part1, question 2 (a, b, c &amp;d)</td>
<td></td>
<td>Analysis of Q1 Part 1, question 2(a, b, c, d); Q1 Part 1, questions 2,3,4,5; Q1 Part 2, questions 1,2,3,4,5; Q2, questions 3(a, b, c, d, e, f, g, h) used as framework for analysis</td>
</tr>
<tr>
<td>Q3. How does</td>
<td>Q1, Part 1</td>
<td>Interview</td>
<td></td>
<td>Analysis of Q1</td>
</tr>
</tbody>
</table>
3.2 Sample Population

The sample population for the research reported in this thesis came from a government secondary school in New South Wales, Australia. This state high school, located at Sydney’s southwest metropolis, is relatively new and has been growing rapidly. The School places a strong emphasis on computer technology. The principal has been keenly supportive of the adoption of computer technology in teaching and learning in the school. At the time of the study, the School had 70 full time staff and 1112 students. The principal granted permission to the researcher to conduct study on “The Implementation of Government Policy in Schools: a case study” at Elizabeth Macarthur High School Narellan, New South Wales in 21st May 1998. See Appendix H. The researcher gained access to school records that contained the number of teachers and students during the school year 1998.

The participating teachers was limited in number due to the time of the training intervention which was held after school hours. Most teachers in the school have
commitments and therefore can’t attend the Internet Training in place for the whole school.

The sample population included 11 teachers who had agreed to participate in a training programme, which emphasised the use of computers in the classroom along with the exploitation of the Internet as a teaching and learning tool. In-service training was advertised for teachers at the school. The participants were teachers, librarians and school executives who did not have training using the Internet and those who had minimal training as well. The Internet Training was conducted in the school year 1998, Term 1 for 3 consecutive weeks. The training commenced from week 4 (Tuesday, 10 February 1998), week 5 (Monday, 16 February 1998) & week 6 (Tuesday, 24 February 1998). The fifteen teachers, who responded to the advertisement, were organised in 2 groups, training for a total of 6 hours, which took place after school hours from 4-6 pm. The researcher devised the Internet Training Module, which was divided into 10 lessons.

At the end of the training intervention, the teachers completed the course outcomes, some of who produced research projects using the Internet. They also comfortably used the Internet as a tool for classroom teaching and prepared lesson plans using the Internet in their respective subject areas. The participants were requested to document their evaluation of the effectiveness of the training sessions by way of diary notes; they were also asked to state how they were intending to implement the use of computers, including Internet access, in the classroom. A follow up questionnaire was
used after the participants had an opportunity to implement the use of Internet in the classroom in their own key learning areas. Several participants were also interviewed as to their perception and personal views about the implementation. The participating teachers were limited in number who responded to 4 questionnaires administered.

- Teacher’s Survey on the Internet Training (Questionnaire Number 1, Part 1), \( n = 11 \).

- Teacher’s Survey After the Implementation of the Use of the Internet in the Classroom (Questionnaire Number 1, Part 2), \( n = 11 \).

- Whole School Survey on the Implementation of Computer Technology at The school selected for the study (Questionnaire Number 2), \( n = 16 \).

- Personal Interview with teachers who had consented to contribute to the research objectives of the thesis (Interview Questionnaire), \( n = 5 \).

3.3 The Researcher’s Role in the Project as a “participant researcher”

In 1997 to 1998 the researcher was delegated with extra duties in the school as an Advanced Skills Teacher, granted by the Department of Education and Training recommended by the school principal. The duties and responsibilities involved conducting Professional Development in Computer Technology for Teachers in the
school in conjunction with the Technology Policy implemented during that period. The researcher prepared the Internet Training Module in collaboration with the school principal. The questionnaires used in the project were based on the strategies of the Computers in Schools Policy of the New South Wales Government. The questionnaires were handed to the participating teachers by the researcher, and they answered the questions of their own accord. The researcher collected and tabulated the data, and finally analysed the results.

Chapter 4 presents the results ensuing from the processing of data obtained by means of the research instruments described below.

3.4 Methods of Research Used: A Case Study Research Model.

The author used a ‘case study research model’ for this inquiry. Qualitative or case study research is different from the quantitative approach, where data can be quantified. However, there are occasions when researchers choose to use their own judgment to analyse relationships of data rather than using quantities or numbers. Guba and Lincoln (1994, p.105) argued that both qualitative and quantitative methods could be used appropriately with any research paradigms. There are four paradigms they analysed and are currently competing, or have until recently competed, for acceptance as the paradigm of choice in informing and guiding inquiry, especially qualitative inquiry: positivism, postpositivism, critical theory and related ideological positions and constructivism.
Since this study is based on observation, interview, documents, records and questionnaires, it has some relevance to the characteristics of ethnographic inquiry.

Qualitative research is also referred to as ethnography according to Wilson (1977) in Tuckman (1994), and is said to be based on the fundamental beliefs that:

- events must be studied in natural settings, that is, be field based and
- events cannot be understood unless one understands how they are perceived and interpreted by people who participated in them. The participant in observation is used as the major data-collection device.

Ethnography, according to Tuckman (1994, p. 366), relies on observations of interaction and interviews of participants to discover patterns and meanings, which form the basis of generalisation, which are then tested through further observation and questioning.

3.4.1 Characteristics of Qualitative Research.

According to Bogdam and Biklen (1992) in Tuckman (1994), qualitative research has the following five characteristics:

- The natural setting is the data source and the researcher is the key data collection instrument.
• It attempts primarily to describe and secondarily to analyse.

• The concern is with process, that is, what has transpired, as much as the product outcome.

• Its data are analysed inductively, as in putting together the parts of a puzzle.

• It is essentially concerned with what things mean, that is ‘why’ as well as ‘what’. (Tuckman, 1994, p.366)

The fundamental questions related to implementation in a school selected for the study are as follows, which served as a basis for formulating questionnaires as instruments of inquiry:

• Is there evidence that training of teachers in the use of computers and the Internet enhances teaching and learning at school?

• Are there implementation strategies for gaining acceptance in the introduction of computer technology and Internet access?

• Is the school executive leadership effective in the implementation of the Internet Policy?
3.4.2 The Specific Problem: Qualitative Research.

The relationship of data between the variables in qualitative or case study research does not differ from those of quantitative research (Guba and Lincoln, 1994). They further argue that building some structure into qualitative or case study research process enhances the ‘conformability’ (means that other researchers using essentially the same setting would be likely to arrive at the same conclusions). The questions to be answered must relate to data collection procedures (1) what the variables are within the observed phenomena and (2) to what extent these variables are related (Tuckman, 1994, p. 369).

3.4.3. Sources of data in Qualitative Research.

There are three types of data sources that may be used in a case study approach according to Tuckman (1994, p. 372). They are as follows:

- interviews of various people or participants in the setting who are involved in the phenomenon of study;
- documents such as minutes of meetings, newspapers, autobiographies, or disposition and
- observation of the phenomena in action.
The above discussion on the nature and characteristics of a ‘case study research model’ or qualitative approach conform to the methods and approaches of the study conducted by the researcher in a school setting on the following grounds.

- The researcher is the key data-collector of the instrument.
- The researcher interviewed various people or participants in the school setting who were involved in the case study.
- The researcher used documents such as note taking and policy documents of the school and Policy Documents of the Department of Education and Training.
- The participants in the study answered the research questions and interview.
- The data were analysed inductively, i.e., key questions were answered by the data collected from the questionnaires and lastly
- The study conducted by the author is in agreement with the paradigms of qualitative research postulated by Guba and Lincoln (1994).

Within the context of the ‘case study research model’, the author made use of a variety of instruments, including questionnaires to sample responses from teachers
participating in computer training, course evaluation questionnaires, interview protocols and follow up surveys of teachers. All of this has been projected against the backdrop of government policies on the use of computers in schools and its implementation at the local level by means of a school-based computer policy.

There is a range of associated questions, which beg for an answer in dealing with the fundamental questions used in this study. These need to be sensitively formulated for inclusion in the *instruments of inquiry* if the conclusions from the research presented here are to be meaningful.

A range of key influences is bound to affect the implementation of a policy pertaining to the use of computers and information technology at school. They are as follows:

- government policy versus school policy;
- role of teachers in curriculum design;
- classroom management;
- teacher training and expertise;
- pupil assessment;
- support by school;
- networking;
- professional development issues;
- funding and
- school executive action for implementation.
These influences provide the focus of attention in this thesis, with the anticipation that the conclusions reached may assist those involved with the use of computers in education: policy makers, teachers and pupils.

3.5 Validity and Reliability of the Instruments used in this Study.

As stated earlier in this chapter, the methodology has been based on a range of inquiry such as the use of questionnaires, interview and policy documents. Discussions as to the validity and reliability of the case study research model use in this inquiry including the research questionnaires were supported by the arguments of: Guba & Lincoln, 1981, 1984, 1994: Glaser & Strauss, 1997: Strauss & Corbin, 1990: Henry, 1960 and Tuckman, 1994 as discussed and explained earlier in this chapter. The research questions were carefully analysed and were answered by the data collected from the questionnaires, policy documents and interviews. The questionnaires fit in with the examples of J. Henry (1960) using questions on educational problems.

3.5.1 Forms of Questionnaires and Interviews Used in this Study

Researchers used questionnaires and interviews to convert the information directly given by a person into data. By providing access to what is “inside a person’s head”, these approaches make it possible to ascertain what a person
knows, what a person likes and dislikes and what a person thinks. This information can be transformed into numbers or quantitative data by using the attitude scaling or rating-scaling techniques or by counting the numbers of respondents who give a particular response, thus generating frequency data (Tuckman, 1994, p.216).

The use of verbal data has come to dominate research in social sciences as in the case of this study. The only way to gather information to support this research is by asking questions on the beliefs, feelings and attitudes of the participating teachers about the Internet Training conducted for them. Foddy (1993, p. 2) pointed out that asking questions is widely accepted as a cost-efficient and sometimes the only way, of gathering information about past behaviour and experiences, beliefs and values, particularly for variables that cannot be measured directly.

The only viable method for conducting this study is to ask questions using questionnaire and interview techniques. The questions were constructed on the basis of merits: how item questions were worded and formatted, clearly defined topics, cultural context, clear purpose, clear idea of the kind of information required, meanings of individual words, grammatical complexities, coding responses and forms of questions and response modes. These issues fall under the category of editing rules to aid the formulation of questions. Foddy (1993) compiled an amalgamation of editing rules for
questions construction prepared by a number of authors. The following are some issues to consider by a researcher in formulating item questions.

- Make sure that the topic has been clearly defined.
- Be clear about the information that is required about the topic and the reason for wanting this information.
- Make sure that the topic has been defined properly for the respondents.
- Make sure that the question is relevant to the respondents.
- Make sure that the question is not biased.
- Eliminate complexities that prevent respondents from easily assimilating the meaning of the question.
- Ensure that respondents understand what kind of answer is required (pp.183-184).

Researchers often use a stimulus-response model when asking questions. This model is based on the assumption that all respondents will understand each item identically (Foddy, 1993, p.12). Survey researchers have favoured the use of constructing questionnaires using closed questions because stimulus-response model implies that each item question must be carefully standardised for validity and reliability reasons (p.12).

Several authors (e.g. Dijkstra and Van der Zouwen, 1997; Oakley, 1991; Davies, 1982; Van der Zouwen, 1982 and Brenner, 1985) in Foddy (1993, p.13) adapted ten most important assumptions that have defined the general orientation of survey researchers in questionnaire construction. They are:
The researcher has clearly defined the topic about which information is required.

Respondents have the information that the researcher requires.

Respondents are able to access the required information under the condition of the research situation.

Respondents can understand each question as the researcher intends it to be understood.

Respondents are willing to give the required information to the researcher.

The answers that respondents give to a particular question are more valid if they have not been told why the researcher is asking the question.

The answers that respondents give to a particular question are more valid if the researcher has not suggested them to the researcher.

The research situation does not influence the nature of the answers given by respondents.

The process of answering questions does not change the respondents’ beliefs, opinions, habits, etc.

The answers that different respondents give to a particular question can be meaningfully compared with one another.

Tuckman (1994) pointed out that the validity of the questionnaire and interview items is limited in the three considerations. However, he added that certain information couldn’t be obtained other than by asking. Even when an alternative is available, the ‘asking’ may be and often is the most efficient. The three considerations are:
To what extent might a question influence respondents to show themselves in a good light?

To what extent might a question ask for information about respondents to attempt to anticipate what researchers want to hear or find out?

To what extent might a question ask for information about respondents what they might not know about themselves? (p. 216)

Certain forms of questions commonly used in questionnaires were adapted from Tuckman (1994) as tools in this study. The variety of ways questions on the other hand may be answered by a multiplicity of modes of responses. Several forms of questions and response mode are as follows: direct versus indirect questions, specific versus unspecific questions, fact versus opinion, questions versus statements, predetermined versus response-keyed questions, unstructured response, fill-in response, tabular response, scaled response, ranking response, checklist response and categorical response (pp. 216, 218-224).

Each form of response mode has its own merits when used in a questionnaire or interview techniques. The following are examples of responses to questions provided by Tuckman (1994).

*Unstructured response*

Why do you think you didn't try harder in high school? ____________ (p. 219)
Fill-in response

In what school did you do your undergraduate work? ______________(p.219)

Scaled response

Suppose you were offered an opportunity to make a substantial advanced in a job or occupation. Place a check opposite each item in the following list to show how important it would be in stopping you that advance.

Question: What are your chances of reaching this goal?

1 1 1 1 1 1

Excellent Good Fair Poor Very Poor

The question asked the respondent to assess his or her likelihood of reaching a goal using the scaled response known as five-point scale or “Likert Scale”. By choosing one of the categories, the respondent indicated the degree to which he or she sees goal of attainment as likely (p. 222).

Ranking response

Rank the following activities in terms of usefulness to your learning how to write behavioural objectives. (Use numbers 1 though 5, with 5 indicating the activity most useful. If any activities were of no use at all, indicate this by a 0).

☐ Initial presentation by consultants
 ranking has the value of forcing respondents to choose between alternatives. If respondents were asked to rate (that is, scale) or accept-reject each activities, they could credit them all equally, but forces them to be critical (p.223). Ranked data are analysed by summing the rank of each responses across subjects, thus obtaining an overall rank or group rank of alternatives.

Checklist response
I get most of my professional and intellectual stimulation from: Check one of the following blanks.

__A. Teachers
__B. Principal
__C. Superintendent
__D. Other professional personnel in the system
__E. Other professional personnel elsewhere
__F. Periodicals, books and other publication (p.225).

In the checklist item the respondent replies by selecting one of the possible choices offered.
Categorical response

Are you a high school graduate? Yes __ No __

Yes-no answer is often used in the categorical response mode. It is similar to the checklist response but simpler, offers the respondent only two response possibilities.

The discussion on the commonly used form of questions and interviews were applied in the construction of questions and response mode in the instruments used in this survey. Questionnaire Number 1, Part 1 and 2, Questionnaire Number 2 and Interview Questionnaires are a mixture of forms of questions and responses elaborated in this section.

For clarity of reading and ease of understanding, the researcher chose a number of questions from each questionnaire and the construction of questions forms and response modes mentioned earlier in this chapter were applied. The examples were presented into questionnaire number, questions and sub-questions.

They are as follows:

- *Questionnaire Number 1, Part 1, question 1: a, b, c and Part 2, question 1:*

Questionnaire Number 1, Part 1, question 1: a, b, c and Part 2, question 1 were constructed to ask teachers what they think they are likely to implement in the
classroom after the Internet Training. The questions asked participant teachers using direct questions, ranked the items from highest to lowest and asked them to answer categorical questions (Yes-No). The nature of the questions was also a combination of unstructured response and a checklist response.

**Part 1, question 1: a, b, c**

1. Could you please answer the following:
   a.) Key learning area __________________________
   b.) Number of years of teaching experience _____________
   c.) Previous technology training. Put a tick in the box provided.
      - None
      - Minimal
      - Average
      - Degree in computing
      - Other, specify ______

Part 1, question 1: a, b, c above fit the criteria of a direct question mode and a checklist mode.

**Part 2, question 1**

1. As a summary, do you believe use of the Internet provided enhanced teaching and learning in your Key Learning Area? Yes___, No___

Rank the following statements in order in terms outcomes in your Key Learning Area through the use of the Internet.
1 = highest score, 5 = lowest score.

☐ Students taking responsibility for their own action.

☐ Teacher as a learner/facilitator/mentor

☐ Student became more involved in learning

☐ Teacher directed learning replaced by student-centred learning

☐ Students produced good projects and assignments using the Internet as against traditional use of books

Can you give specific example? ____________________________________________

The above question, Part 2, question 1 conforms to the structure of a response mode, and ranked order mode answers and an open-ended question.

• Questionnaire Number 2, question 1, 3 and 4:

The types of questions and response mode used in Questionnaire Number 2 are a combination of response, categorical, scaled and unstructured response, commonly called open-ended question.

Question 1

1. In the implementation of the Internet Policy at Elizabeth Macarthur High School, what do you think were the key influences in its successful implementation? Rank the following from 1 to 10.
1= greatest influence 10= greatest hindrance

☐ In-service training
☐ Access to computer
☐ Technology support
☐ Whole school support
☐ Teaching strategies
☐ Monitoring of students using the Internet
☐ Networking facilities
☐ Classroom Management
☐ School executive implementation process
☐ Student assessment

Ranked response mode form of question was used in question 1 of Questionnaire Number 2.

**Question 3**

3. A Professional Development Program of teachers in Computer Technology and Internet Training has been implemented at Elizabeth Macarthur High School. Please indicate your own view about the following statement by encircling one of the letter choices next to each of the following statements.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

a.) All if not most teachers need computer technology training as clearly stated in one of the key strategies of the Government's Computer Policy in Schools.

SA A U D SD

b.) The school clearly identified the need of Internet Training for teachers.

SA A U D SD

c.) Teachers need ongoing support for computer technology training.

SA A U D SD

d.) Teachers should be provided with computers for loan to take home to further support computer technology training.

SA A U D SD

e.) Teachers with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.

SA A U D SD

f.) The Computer Co-ordinator should have a major role in computer-based training for the school.

SA A U D SD

g.) The school should have a clearly defined Professional Development Training Plan in Computer Technology.

SA A U D SD
h.) The school should provide Computer-Based Technology training specifically geared towards the use of computers in all Key Learning Areas.

\[
\begin{array}{cccccc}
SA & A & U & D & SD \\
\end{array}
\]

I.) The school should evaluate Technology Implementation in the form of action research.

\[
\begin{array}{cccccc}
SA & A & U & D & SD \\
\end{array}
\]

j.) The school should have a software and hardware compatibility policy.

\[
\begin{array}{cccccc}
SA & A & U & D & SD \\
\end{array}
\]

Question 3 above is a scaled response question, a five-point scale known as "Likert Scale".

**Question 4**

4. Please indicate if you have some concerns, recommendations and problems in the implementation of Elizabeth Macarthur High School. ___________________

An open-ended question was used in question 4 above. This is similar to unstructured response.
• *Interview Questions:*

The type of questions used in questions 6 and 9 were a mixture of direct and indirect questions, specific and non-specific questions and an open-ended question.

6.) Teachers need ongoing support in computer training as strongly suggested by the survey. Do you think computer training should be done in a regular basis? If so, by whom?

9.) The school has a clearly defined Professional Development Training Plan in Computer technology as revealed by the survey, what do you think is stopping the teachers from undergoing such training? Please specify _________________________

3.5.2 *Evaluating questionnaires – reliability and validity:*

Evaluating standards can be explicitly built into a question. This is the case when respondents are asked to assess each stimulus in a range of stimuli by comparing each with a defined standard. If this can be done properly, the researcher knows both what evaluative standard has been used and that all respondents have made their judgement in the same way (Foddy, 1993, p.88).

In constructing questionnaires, it is important that each item should be tested for clarity of purpose, correct wording and relevance to the aim of the study. In formulating questionnaires, the researcher should take into consideration that the
questions are not ambiguous and bias. In the case of scaled response or five-point scale, it is desirable to pilot test each item. Pilot testing is usually desirable to test on a questionnaire based on the result of the test (Tuckman, 1994, p.235). Item analysis of items intended to measure the same variable in the same way is one important use of data collected from a pilot test. However, item analysis is not as critical for the refinement of questionnaires as they are for the refinement of the test. Responses to questionnaire items are usually reviewed by eye for clarity and distribution without necessarily running an item analysis (Tuckman, 1994, p.237).

The previous discussion in this section talked about the forms of questionnaires and interviews used, as they applied to the questionnaire construction of this research. The three questionnaires used in this study satisfied the conditions of setting out questions in Foddy (1993) and Tuckman (1994). Each item question in the questionnaires were carefully written, reviewed, re-written and tested to its final format in constant consultation with teachers, executives and the principal of the sample school. The questions were based on policy documents on computers in schools of the New South Wales Government, previous computer technology training of teachers as mentioned in the literature review, readings from other technology-based education documents, books and journals. The refined questionnaires were edited by the able assistance of the research supervisor.

The feature of Questionnaire Number 1, Part 1 and 2 was clear and straightforward because the questions were directly related to the purpose of the
Internet Training of teachers in the sample school. The questions in part 2 were constructed to find out how the teachers implemented what they learned in the training.

The scaled response items in questions 2 and 3 of Questionnaire Number 2 were not necessary to pilot test them and item analyses are not critical for the refinement of questionnaires, as stated in Tuckman (1994, p.237). The questions were not intended to measure the same variables because they were independent of each other. Rather the questions were reviewed for clarity of intention and refined with the assistance of teachers, school executives and the principal of the sample school. Questionnaire Number 2 was formulated as a follow-up survey to conform the results of the outcome of data gathered in Questionnaire Number1.

The Interview Questions were constructed in conjunction with the criteria of questionnaire construction as mentioned earlier in this section. They were questions formulated to match up the overall data collected from the 2 questionnaires. The questions were carefully thought of, written and revised before conducting interviews to participating teachers, and again with proper consultation and collaboration with selected members of the school community.

In summary, the reliability and validity of the instruments of inquiry used in this study that is, Questionnaire Number 1, Part 1 and 2, Questionnaire Number 2 and Interview Questionnaires conform with the conditions and forms of questions and interviews in Tuckman(1994, p. 216, pp. 218-224) and Foddy
(1993, pp. 2, 12, 13, 183, 184 and 185) and pilot testing and evaluating item questions for reliability and validity (Tuckman, 1994, p. 235). Each item questions in the three questionnaires were carefully reviewed and refined by adapting the editing rules in the formulation of questions in Foddy (1993, pp. 183-184) to the final format before distributed and administered by the researcher to the sample population.

3.6 Instruments of Inquiry

The commonly used instruments of inquiry include surveys conducted with the aid of a variety of questionnaires, interviews held with parties involved in the issues of concern, statistics related to the phenomena under investigation, anecdotal evidence gleaned from relevant reports and directly observed factual evidence.

The following instruments of inquiry have been deemed to be relevant to the research objectives reported in this work, viz.

- Questionnaires
- Surveys
- Interviews

In addition, conclusions drawn from samples of pupils' work and author's own observations, based on her experiences in providing in-service training for professional development of teaching staff, are presented in support of the conclusions drawn from the use of the above instruments.
3.7 Questionnaires

A number of questionnaires were designed by the author for use in reaching the conclusions reported in this thesis. Questionnaire design was guided by the author’s experience in teaching Information Technology and her observations of students’ responses to the introduction of new concepts along with new teaching strategies. An additional factor was the author’s familiarity with relevant government policies pertaining to the use of computers in school, and practice of implementation in schools at large. The questionnaires used ranked-ordered scales, ranking responses from highest to lowest in terms of importance, i.e. ‘strongly agree’ to ‘strongly disagree’ (Creswell, 1994, p. 121).

Details of the questionnaires used in the surveys conducted are given in Appendix A, B and C.

The questionnaires were formulated and designed from readings of different sources of information. The sources are: a.) Literature review in chapter 2, p. 11 (Harper and Hedberg, 1997; Downes, 1991; Debrency and Ellis, 1997; David, 1996 and The Report on Computer Proficiency for Teachers by the Department of Training Coordination, New South Wales, 1997); b.) School/government information technology policies (Government’s Computers in Schools Policy, 1996 and one of the strategies of this policy, i.e., Connecting NSW Government Schools to The Internet); c.) Bulletins/memoranda to school principals by the NSW Department of Education

The author's years of experiences in teaching computing studies courses from junior to senior years (Year 7 Computer Awareness; Year 8 Computing Studies; Years 9-10 Computing Studies; Years 11-12, 2 Unit HSC Computing; Years 11-12, 2 Unit Computing Applications and Years 11-12, 2 Unit HSC Information Processing and
Technology) in the government schools of the NSW Department of Education and Training also formed as the basis of constructing these questionnaires.

3.8 Surveys

Questionnaires were used for conducting surveys at different stages of the study, viz.

- Before the commencement of training,
- After the completion of training, and
- Following the classroom implementation of computer use and use of the Internet.

Questionnaires targeted the following sample populations:

- Teachers who had participated in a pilot training scheme aimed at enabling them to proactively introduce and use computers, including Internet, in the classroom.
- Teachers who did not participate in the training activity.

Responses were collated, tallied and calculated in percentage and compared in the course of evaluating the survey findings.
Questionnaire Structure:

The questionnaires were a mixture of quick responses questions and a Likert Scale. Questionnaire Number 1 was divided into two parts. Part 1 was administered after the 6 hours training intervention and had 8 questions with quick responses. Question number 1 asked about the subject area of the teachers, years of teaching experience and previous technology and Internet training. Questions 2 to 8 asked the teachers to rank the answers in priority order from highest score to the lowest score, 1 = highest score, 5 = lowest score.

The results of the responses were tabulated, ranked and analysed.

Example of a question and responses from the questionnaire is shown:

2. Having successfully completed the Internet Training at Elizabeth Macarthur High School, how will you integrate the use of the Internet in the classroom? Rank all the items listed below from 1 to 5.

1= highest score, 5 = lowest score.

- Prepare lesson plan incorporating Web sites as source of information
- Set clearly defined goals using the Internet to achieve student outcomes
- Monitor students while searching on the Net
- Locate Web sites useful in my subject area for student's use
- Assess student's work using the Internet
Questionnaire Number 1 Part 2 was administered to the participating teachers after implementing the use of the Internet in the classroom. They were required to give responses to the questionnaire 5 weeks after the training intervention. The questionnaire was composed of questions with a combination of quick responses by ranking the items then supported by feelings, views and beliefs.

An example of one question is provided.

1. As a summary, do you believe use of the Internet provided enhanced teaching and learning in your Key Learning Area? Yes ___, No ___

Rank the following statements in order in terms outcomes in your Key Learning Area through the use of the Internet.

1. highest score, 5 = lowest score.

- □ Students taking responsibility for their own action.
- □ Teacher as a learner/facilitator/mentor
- □ Student became more involved in learning
- □ Teacher directed learning replaced by student-centred learning
- □ Students produced good projects and assignments using the Internet as against traditional

Use of books

Can you give specific example? ___________________________________________

A total of 15 items in Questionnaire Number 2 was administered to a pilot group of teachers and executives in the sample school after collecting the data from
Questionnaire Number 1, Part 1 and 2. The responses given by the sample group to each individual item were tabulated and analysed using statistical procedure. The following key scored a "Procrastination Scale".

SA = 5  A = 4  U = 3  D = 2  SD = 1

SA - Strongly Agree  
A - Agree  
U - Undecided  
D - Disagree  
SD - Strongly Disagree

Example of a question is show:

3. A Professional Development Program of teachers in Computer Technology and Internet Training has been implemented at Elizabeth Macarthur High School. Please indicate your own view about the following statement by encircling one of the letter choices next to each of the following statements.

SA = strongly agree  
A = agree  
U = undecided  
D = disagree  
SD = strongly disagree

a.) All if not most teachers need computer technology training as clearly stated in one of the key strategies of the Government's Computer Policy in Schools.

b.) The school clearly identified the need of Internet Training for teachers.
c.) Teachers need ongoing support for computer technology training.

d.) Teachers should be provided with computers for loan to take home to further support computer technology training.

e.) Teachers with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.

f.) The Computer Co-ordinator should have a major role in computer-based training for the school.

g.) The school should have a clearly defined Professional Development Training Plan in Computer Technology.

h.) The school should provide Computer-Based Technology training specifically geared towards the use of computers in all Key Learning Areas.

i.) The school should evaluate Technology Implementation in the form of action research.

j.) The school should have a software and hardware compatibility policy.
The interview was conducted after collecting and analysing the data gleaned from the 3 questionnaires. The interview was a combination of question and answer. The participating teachers answered the questions and were documented by the researcher. The interview questions were formulated to ask the teachers what they believed as a result of the survey questions. There were 10 questions with a mixture of short and long responses. Examples are shown:

6.) Teachers need ongoing support in computer training as strongly suggested by the survey. Do you think computer training should be done in a regular basis? If so, by whom?

9.) The school has a clearly defined Professional Development Training Plan in Computer technology as revealed by the survey, what do you think is stopping the teachers from undergoing such training? Please specify ____________________

3.9 Interviews

Once the survey results were available, interviews were conducted with selected teachers and members of school executive. The purpose of these interviews was twofold: firstly to consolidate the survey results, and secondly to formulate recommendations for improved effectiveness of policy implementation. During the interviews, a set of 10 questions, devised by taking into account the survey findings,
was used consistently so as to avoid bias in the formulation of conclusions. Details of the questions used during these interviews are given in Appendix D.
Chapter 4

REPORT FINDINGS

This Chapter contains a detailed analysis of data obtained from the data collection procedures listed in chapter 3. The findings have been tabulated and presented in graphical form for ease of reading and comprehension. The questions have been analysed and presented. Appendices A, B, C and D contain the following complete questionnaires.

- Teacher's Survey on the Internet Training. (Questionnaire Number1, Part 1). This questionnaire is composed of eight questions about what teachers think they are likely to implement in the classroom after the Internet Training (n=11).

- Teacher's Survey After the Implementation of the Use of the Internet in the Classroom. (Questionnaire Number1, Part 2). Part 2 Questionnaire was conducted one month after the Internet Training of the teachers who participated in the study (n=11).
• Whole School Survey on the Implementation of Computer Technology at The school selected for the study (Questionnaire Number 2). This survey was designed to obtain the views and attitudes of a wider circle within the school community on computer technology being implemented at the school selected for the study (n= 16).

• Personal Interview with teachers who had consented to contribute to the research objectives of the thesis (Interview Questionnaire). Teachers volunteered to be interviewed during their free period in the school. Each of the teachers was asked questions using the interview questionnaire (n=5).

4.1 Teacher’s Survey on Internet Training. (Questionnaire Number1, Part 1)

Questionnaire Number1, Part 1 was conducted immediately after the training intervention that was implemented. The questionnaire was issued and conducted in the school year 1998, Term 1 for 3 consecutive weeks. The training commenced from week 4 (Tuesday, 10 February 1998), week 5 (Monday, 16 February 1998) & week 6 (Tuesday, 24 February 1998). The questionnaire was issued and conducted in the school year 1998, Term 1 for 3 consecutive weeks. The participating teachers were divided into two sub-groups. The training intervention took place after school hours from 4-6 pm. The participants were teachers, librarians and school executives who do not have training using the Internet and those who had minimal training as well. The researcher devised the Internet Training Module. The training module was divided
into 10 lessons. The lessons were: terminologies and definitions using the Internet, use of browsers and searching the web, saving documents from the web to hard drive or floppy disk, printing documents from the web, selecting a search engine and refining the web by Boolean Search, locating websites on the Net, school research projects using the web, composing and sending e-mails. At the end of the training intervention, the teachers completed the following course outcomes: know the different terminologies used in the Internet such as URL, domain, http, protocol, ISP, hyperlink and search engines; located websites comfortably using different search engines like Alta Vista, Web Crawler, Yahoo, InfoSeek; refined searches using Boolean Search; produced at least three research projects using the Internet; cited web sources in a research paper; comfortably used the Internet as a tool for classroom teaching and prepared lesson plans using the Internet in their respective subject areas.

The survey questions were designed to find out about the Key Learning Areas of the teachers who participated in the study, the number of years of teaching experience, previous computer technology training and Internet training and how the teachers thought they would integrate the use of the Internet in the classroom. It was also designed to determine what Internet functions are likely to be implemented in the classroom, what management strategies are likely to be implemented using the Internet, the technical support they believed they needed when using the Internet and school support they believed they needed when using the Internet in the classroom.
**Question 1.** The teachers who participated in the study were asked questions about the following issues.

a. Key learning areas

b. Number of years of teaching experience

c. Previous computer technology training

d. Previous Internet training.

See Appendix A for the complete question

The tables below show the results of data collected in Questionnaire 1, Part 1, Q1-a, b, c, & d and Q2, Q3, Q4, Q5, Q6, Q7 & Q8.

a.) Table 1 represents the key learning areas of the sample study.

This question was aimed specifically at determining the subject areas or faculties of the teachers selected for the study. The majority of the teachers were from the PD/H/PE faculty and the rest were spread out among the different subject areas.
Table 1

Number of respondents from each key learning area.

<table>
<thead>
<tr>
<th>Key Learning Area</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maths/Computing</td>
<td>1</td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Science</td>
<td>1</td>
</tr>
<tr>
<td>TAS</td>
<td>1</td>
</tr>
<tr>
<td>Careers</td>
<td>2</td>
</tr>
<tr>
<td>PD/H/PE</td>
<td>4</td>
</tr>
<tr>
<td>School Counsellor</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

b.) Table 2 represents the number of years of teaching experience of each respondent.

This question was designed to determine the number of years of teaching experience of each participant. The highest number of years of teaching experience is 27 with a mean average of 10.72 years.
Table 2

Number of years of teaching experience.

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Code number</th>
<th>Years of teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>01</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>04</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>06</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>07</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>08</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>09</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>010</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>011</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>012</td>
<td>14</td>
</tr>
<tr>
<td>10</td>
<td>013</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>014</td>
<td>7</td>
</tr>
</tbody>
</table>

c.) Table 3 indicates the previous computer technology training of the sample study. They were grouped according to five categories as shown on the table.

The question was designed to find out what level of computer training each participant had.
Table 3

<table>
<thead>
<tr>
<th>Degree of training</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No training</td>
<td>1</td>
</tr>
<tr>
<td>Minimal</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>4</td>
</tr>
<tr>
<td>Computing degree</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

d.) Table 4 represents the previous Internet training of each respondent.

This question was designed to determine the previous Internet training of each participant. This data indicated that 5 out of 11 of the teachers who participated in the training had no previous Internet training and 5 out of 11 had a limited numbers of years or minimal training.
Table 4

Previous Internet Training

<table>
<thead>
<tr>
<th>Degree of training</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No training</td>
<td>5</td>
</tr>
<tr>
<td>Minimal</td>
<td>5</td>
</tr>
<tr>
<td>Average</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11</td>
</tr>
</tbody>
</table>

Question 2. Having successfully completed the Internet Training, how will you integrate the use of Internet in the classroom?

This question was designed to determine how teachers believed they would integrate the use of the Internet in their respective subject areas. Teachers were asked to rank the issues: preparing lesson plans that include websites addresses as source of information, monitoring students by the teacher while they are using the Internet, assessment of students’ work after using the Internet as a tool for their research work. The teachers were to indicate their ranking score from 1(highest score) to 5 (lowest score). Table 5 indicates how they ranked the issues.

The responses to question 2, indicated teacher's beliefs in the importance of ways and methods of integrating the use of the Internet in teaching. The teachers ranked locate websites as the top priority in the list. It is also important for them to prepare lesson
plans using Internet sites, and it was given a second priority rating.

Table 5

<table>
<thead>
<tr>
<th>Rank</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.</td>
<td>prepare lesson plan incorporating websites as sources of information</td>
</tr>
<tr>
<td>2</td>
<td>2.</td>
<td>set clearly defined goals using the Internet to achieve student outcomes</td>
</tr>
<tr>
<td>3</td>
<td>3.</td>
<td>monitor student while searching on the Net</td>
</tr>
<tr>
<td>4</td>
<td>4.</td>
<td>locate websites useful in my subject area</td>
</tr>
<tr>
<td>5</td>
<td>5.</td>
<td>assess student’s work using the Internet</td>
</tr>
</tbody>
</table>

Question 3. Rank the following functions of the Internet in schools in order of importance.

This question was designed to determine the teacher’s perception and feelings on the significance of the following issues: research and inquiry skills of students, writing skills, collaborative learning, student centred learning and logical reasoning of students. The teachers ranked highest the Internet functions that play a significant role in teaching and learning, developing the research and inquiry skills of students.
Table 6

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>developing research inquiry of students</td>
</tr>
<tr>
<td>3</td>
<td>developing communication and writing skills of students</td>
</tr>
<tr>
<td>4</td>
<td>collaborative learning could take place between students and teachers</td>
</tr>
<tr>
<td>2</td>
<td>developing student-centred learning</td>
</tr>
<tr>
<td>5</td>
<td>developing logical reasoning of students</td>
</tr>
</tbody>
</table>

Question 4. In your view which of the following Internet functions are likely to be implemented in your classroom?

This question refers to the issues listed in Question 3. It is designed to determine the possibility of implementing the issues: *research and inquiry skills of students, writing skills, collaborative learning, student centred learning and logical reasoning of students* to a classroom situation. The responses to Question 4 reinforced their feelings and beliefs as indicated in Question 3. The teachers ranked Questions 3 & 4 in an identical manner.
Table 7

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>developing research inquiry of students</td>
</tr>
<tr>
<td>3</td>
<td>developing communication and writing skills of students</td>
</tr>
<tr>
<td>4</td>
<td>collaborative learning could take place between students and teachers</td>
</tr>
<tr>
<td>2</td>
<td>developing student-centred learning</td>
</tr>
<tr>
<td>5</td>
<td>developing logical reasoning of students</td>
</tr>
</tbody>
</table>

**Question 5. In your view which of the following classroom management strategies are you likely to implement in using the Internet in the classroom?**

Classroom management is one of the key elements in successful teaching. The teachers were surveyed on their views on what classroom management strategies to implement in the classroom when using the Internet. The strategies included a traditional way of teaching, teacher-directed teaching, peer tutoring and collaboration between teachers and students. The result of the survey showed collaboration between teachers and students ranked number one on the list. The teachers believed that this type of classroom strategy is one that they are likely to implement in their classroom when using the Internet.
Table 8

<table>
<thead>
<tr>
<th>Rank</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>teacher-directed learning</td>
</tr>
<tr>
<td>2.</td>
<td>students collaboration and peer tutoring</td>
</tr>
<tr>
<td>3.</td>
<td>collaboration between teachers and students</td>
</tr>
<tr>
<td>4.</td>
<td>use of student expert(s) to assist teachers in the classroom</td>
</tr>
<tr>
<td>5.</td>
<td>traditional way of teaching, i.e., question and answer method</td>
</tr>
</tbody>
</table>

Question 6. Do you think technical support (hardware and software) is important when using Internet in the classroom?

Teachers believed that technical support is important too. They believed that a technical person should always be available in the school when they need help. This item was ranked number 1, followed by having Internet coordinator availability when teachers need help. The results of this question showed a strong belief of the teachers to have strong technical support in the school.
Table 9

<table>
<thead>
<tr>
<th>Rank</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>technical person should always be available at school</td>
</tr>
<tr>
<td>2</td>
<td>Internet coordinator is available when teachers need help</td>
</tr>
<tr>
<td>3</td>
<td>expert in networking should be available at school</td>
</tr>
<tr>
<td>4</td>
<td>if technical person is not available at school, the school should employ fulltime support</td>
</tr>
<tr>
<td>5</td>
<td>easy access to school timetable and communication facilities to call for help</td>
</tr>
</tbody>
</table>

Question 7. In your views which of the following support are likely to be needed when using the Internet in the classroom?

The data from this table indicated that teachers believe computer teachers' support is important and is likely to be needed when using the Internet in the classroom as revealed by the teachers who participated in the study. This item was ranked first on the list followed by curriculum support and support from fellow teachers as equal rank number 2.
### Table 10

<table>
<thead>
<tr>
<th>Rank</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>curriculum support</td>
</tr>
<tr>
<td>2.</td>
<td>support from fellow teachers</td>
</tr>
<tr>
<td>3.</td>
<td>computer teacher support</td>
</tr>
<tr>
<td>4.</td>
<td>whole school support</td>
</tr>
<tr>
<td>5.</td>
<td>executive leader's support</td>
</tr>
</tbody>
</table>

**Question 8. In your view do you think you need support in writing lesson plans to integrate the use of Internet in the classroom?**

When teachers were asked if they needed support in writing lesson plans to integrate the use of the Internet in the classroom, they said they believed that skills in lesson plan writing using the Internet should be developed on a faculty basis on staff development time and this item was ranked number one among the items. They felt that staff development on a faculty basis would assist them write lesson plans using the Internet. As a corollary, they believed that it is a faculty responsibility.
Table 11

<table>
<thead>
<tr>
<th>Rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1. school</td>
<td>school should get an expert in lesson plan</td>
</tr>
<tr>
<td></td>
<td>should get</td>
<td>writing using the Internet</td>
</tr>
<tr>
<td>5</td>
<td>2. use</td>
<td>use teachers with expertise in the Internet</td>
</tr>
<tr>
<td></td>
<td>teachers with</td>
<td>use to write lesson plans</td>
</tr>
<tr>
<td>2</td>
<td>3. should be</td>
<td>a faculty responsibility</td>
</tr>
<tr>
<td>3</td>
<td>4. head</td>
<td>head teachers should assist in lesson</td>
</tr>
<tr>
<td></td>
<td>teachers</td>
<td>preparation incorporating the use of the</td>
</tr>
<tr>
<td>1</td>
<td>5. lesson</td>
<td>lesson plan using the Internet should be done</td>
</tr>
<tr>
<td></td>
<td>plan using</td>
<td>by faculty basis on staff development time</td>
</tr>
<tr>
<td>6</td>
<td>6. should be</td>
<td>individual teacher responsibility</td>
</tr>
</tbody>
</table>

4.2 Teacher’s Survey After the Implementation of the Use of Internet in the Classroom. (Questionnaire Number 1, Part 2, Q1, Q2, Q3, Q4 & Q5)

This survey was designed to obtain the views and attitudes of teachers selected for the study after they used the Internet in their respective subject areas. The question was aimed at finding out if teachers believed the use of the Internet in the classroom enhanced teaching and learning. They were given the opportunity to write down specific examples of their classroom experiences in the integration of the Internet in their teaching. At the conclusion of this questionnaire, the teachers were asked to express their feelings and concerns about what might stop them from using the Internet in the classroom. A list of computer technology terms: access to computer,
lack of technology training, time table, lack of technology support, not enough computers, was provided to assist them in formulating their ideas.

Question 1. As a summary, do you believe the use of Internet provided enhanced teaching and learning in your Key Learning Areas? Can you give specific example?

This question surveyed teachers after they implemented the use of the Internet in the classroom. The teachers provided specific examples from their observation in the classroom when using the Internet. They believed that the use of the Internet enhanced teaching and learning in their subject areas. Teachers were asked to rank the following categories from 1 to 5 as shown on Table 12: student taking responsibility for their own learning was ranked number one, followed by teacher as a learner/facilitator/mentor. Student became more involved in learning was ranked 3rd, followed by teacher directed learning replaced by student-centred learning and students produced good projects and assignments using Internet as against traditional use of books was ranked 5th in the list. The teachers provided specific examples of their observations in the classroom when using the Internet. The following extracts illustrate their experiences.

- Senior students in year 12. They were given ‘a case study on a chosen sector of the Australian Food Industry’. The Internet gave them more scope to answer the areas of research to the level required immediately without having
to bother busy company staff or have to put up with the delays of the mail. Therefore more time could be spent on the assignment analysis.

- Working though tectonic 5 CD showing plate movement. Was enhanced with information from the Internet.

- Research tool especially for HSC review and ecological and technical information for study.

From the above comments of teachers who participated in the Internet training, the majority successfully implemented use of the Internet in their Key Learning Areas. A few of them did not have the opportunity to use the Internet because of several reasons. The teachers believed use of the Internet in the classroom is a good tool for research and hence enhanced teaching and learning.

Table 12

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. student taking responsibility for their own learning</td>
</tr>
<tr>
<td>1</td>
<td>2. teacher as learner/facilitator/mentor</td>
</tr>
<tr>
<td>2</td>
<td>3. student became more involved in learning</td>
</tr>
<tr>
<td>3</td>
<td>4. teacher-directed learning replaced by student-centred learning</td>
</tr>
<tr>
<td>4</td>
<td>5. students produced good projects and assignments using the Internet as against traditional use of books</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Question 2. Has the use of Internet broadened the scope of sources of information in your subject area for students?

The data gathered from this question indicated that teachers believed the students' research projects were enhanced using the Internet as a tool. The teachers also felt that when they gave research projects to their students the quality of work was enhanced and essay writing was improved after the teachers implemented the use of the Internet in their classroom teaching.

Table 13

<table>
<thead>
<tr>
<th>Rank</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>essay writing improved using the Internet</td>
</tr>
<tr>
<td>2.</td>
<td>enhanced research project using the Internet</td>
</tr>
<tr>
<td>3.</td>
<td>students incorporated graphics in their project presentation</td>
</tr>
</tbody>
</table>

Question 3. Do you think the research/inquiry skills of your students improved using Internet?

This question was designed to find out if teachers believed the research/inquiry skills of students improved after using the Internet in the classroom. Teachers were asked to rank the following categories: Database management skills of students developed,
exploration methods of students improved, handling of information developed and evidence of variety of research. The result of the survey revealed that teachers believed exploration methods of students improved after using the Internet in the classroom. It also showed that teachers ranked handling of information developed as second in the list. The teachers believed that students were able to discriminate and handle information from the Internet more responsively after implementing the use of the Internet in their classroom teaching.

Table 14

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>database management skills of students developed</td>
</tr>
<tr>
<td>2</td>
<td>exploration methods of students improved</td>
</tr>
<tr>
<td>3</td>
<td>handling of information developed</td>
</tr>
<tr>
<td>4</td>
<td>evidence of variety of research</td>
</tr>
</tbody>
</table>

Question 4. Do you feel that you could make more use of the Internet in your Key Learning Area? If yes, could you support your answer?

Question 4 was formulated to express the feelings and beliefs of teachers if they could make more use of the Internet in addition to the issues and items mentioned in the previous questions. The comments below are their responses.

- Yes, statistics and research current trends.
• Yes, but need better access and more time. Both of which are coming with the new science computer room.

• Not during class time.

• Yes, resources for the Career Education on the Internet are tremendously useful and diverse whether interactive or static.

• Yes, if I could learn more different research techniques.

• I need to become familiar with room, computers, increase confidence to be able to take a class.

• Yes, by letting students access more up-to-date information rather than relying on textbooks which can be outdated.

• Yes, I am in the process of putting together the "best product" information for use of IBM's with the expectation that these programs will be integrated into key learning areas.

• Yes, students regularly do research assignments, which the Internet opens up wealth of information.

• Yes, especially in Health and Movement. However, difficulty could arise with class sizes and access to computer rooms at appropriate times. I have not as yet had the opportunity to use the facilities with my classes.

The majority of the teachers who participated in the study answered 'yes' and they have supported their answer with an explanation. The teachers believed the students could learn more through access to the Internet by getting up-to-date information rather than relying on textbooks, which can be outdated. One respondent commented
that resources for the Career Education on the Internet are tremendously useful and
diverse whether interactive or static. However, some of the teachers did express some
concerns about lack of confidence with using the computers, big class sizes and
access to computers in appropriate times.

Question 5. If your answer is NO in question 4, what do you feel is stopping you
from making more use of the Internet? The following are some of the reasons
teachers commonly list. Could you please comment in a few words?

Access to computers, lack of technology training,

Timetable, lack of technology support, and not enough computers

This question was aimed at finding out about the feelings and views of teachers
involved in the study on making more use of the Internet. There were concerns
relating to the issues listed in the question. They believed access to the computer
during a busy timetable is stopping them from using the Internet. Lack of technology
training is also one of the issues confronting the teachers. They also expressed
concern that increased tasks from the executives is preventing them from using the
Internet because of limited time. The following are extracts from their comments.

- All of the above: access to computers, lack of technology training, timetable,
lack of technology support and not enough computers. But more importantly
teacher’s ‘time’ available in management review because of increased task,
documents from the BOS.
- All of the above.
• We expect to be presented with 'a time table requirement for access' to the computers starting 1999.

• We need access on line in each faculty.

Analysis

The data collected and presented in the above discussion forms a basis to answer one of the key research questions, "How does the teacher training in the use of Internet enhance teaching and learning at the sample school?" The questionnaire was designed to find out about teachers views of the effectiveness of Internet training conducted in three sessions for three consecutive weeks in Term 1 during the school year 1998. The Questionnaire was divided into two parts; the first part was conducted immediately after the training intervention and the second part were conducted a month after the teachers implemented the use of the Internet in the classroom.

The sections of the Questionnaire are listed below.

• **Questionnaire Number 1, Part 1.** Teacher's Survey on Internet Training.

  This questionnaire is composed of eight questions.

• **Questionnaire Number1, Part 2.** Teacher's Survey After the Implementation of the Use of Internet in the Classroom. Part 2 of the Questionnaire was
conducted one month after the Internet Training of the teachers who participated in the study.

The results of the first questionnaire indicated the different subject areas of the teachers participated in the survey. The average number of years of teaching experience was 10.72. The level of computer technology training and previous Internet training appeared to be minimal as indicated by the data. Based on the data collected from Questionnaire Number 1 Part 1, the teachers believed that locating websites in their subject areas and preparing lessons incorporating websites were integrated in their classroom teaching using the Internet. They implemented classroom strategies like: collaboration between teachers and students. The teachers also believed and observed when using the Internet in the classroom, the research and inquiry skills of their students were developed. The data of Questionnaire Number 1 Part 1 also revealed that technical and computers’ support were vital.

In summary, the findings and data in Question 1, Part 1, revealed the following aspects.

- There is an acute need for computer technology and Internet training within the school as teachers in the survey lack ample training in the area of computer technology and the use of the Internet.
• The faculty or head of the faculty should play an important role in assisting the teachers in the preparation of lesson plans given that the use of the Internet at the time of the study was in its infancy in its implementation in the schools.

• The school needs to be equipped with technical support for teachers.

• The teachers need an on-going school development program in the area of computing technology to keep them abreast of the new trends and developments in this area.

The second questionnaire was designed to find out if what the teachers learned from the Internet training was implemented in the classroom. In question 1, teachers were asked if the use of the Internet in the classroom enhanced teaching and learning in the subject areas. They were provided with a list of factors to help them formulate their views. Upon implementing the use of the Internet in the classroom, the teachers observed that students took responsibility for their own learning, contributed to enhance learning using the Internet.

The teachers who participated in the study made some comments and observations and were able to give specific examples based on their implementation of the Internet in the classroom. One of the teachers said, "Year 12 students related their upcoming Mock Job Interviews via the Internet and discovered for themselves successful/unsuccessful responses." Another comment was "senior students in year 12. A ‘case study on chosen sector of the Australian Food Industry’ was a part of the
assessment procedure. The Internet gave them more scope to answer the areas of research to the level required immediately without having to bother busy company staff or have to put up with the delays of the mail. Therefore more time could be spent on the assignment analysis.” The comments from the two teachers showed they believed use of the Internet in the classroom could enhance learning as students became more responsible for their own learning. When the teachers were asked if use of the Internet broadened the scope of sources of information in their subject areas for the students, the data revealed that teachers believed that student’s research projects were enhanced and the quality of essay writing improved. Exploration methods of students also improved as a result of the use of the Internet in the classroom. One teacher stated, “the resources for the Careers Education on the Internet are tremendously useful and diverse whether interactive or static.” Another teacher commented, he could “make more use of the Internet by letting the students access more-up-to-date information rather than relying on textbooks which can be outdated”. The teachers believed that several issues like access to computer, lack of technology and Internet training, busy timetable, not enough computers in the school and lack of technology support are factors that might stop them from making use of the Internet.

In summary, the findings and data in Question 1, Part 2, revealed the following aspects of teachers beliefs and observation of their students.

Based on what teachers believed and observed in the classroom after implementing what they learned in the Internet training, the data collected in Question 1, Part 2
answered one of the key research questions, how does teacher training in the use of
the Internet enhance teaching and learning at the sample school?

In summary,

- The teachers who participated in the study were asked questions about how
they would integrate use of the Internet in the classroom having successfully
completed the Internet training. They believed that *locating websites in their
subject area for student use, lesson plan incorporating websites* and *setting
clearly defined goals* are the 3 main items that are important and can enhance
teaching and learning.

- Teachers were asked if the use of the Internet in the classroom enhanced
teaching and learning in the subject areas, upon implementing the use of the
Internet in the classroom, the teachers observed that *students took
responsibility for their own learning*, contributed to enhanced learning using
the Internet.

- Collaboration between teachers and students, student collaboration and peer
tutoring are classroom strategies the teachers implemented using the Internet
in the classroom and contributed to enhance teaching and learning.
• Data revealed that student’s research projects were enhanced, the quality of essay writing and exploration methods of students improved after using the Internet in the classroom

The above findings revealed that teachers believed: *locating websites for student use, lesson plan incorporating websites, clearly defined goals using the Internet, students taking responsibility for their own learning, collaboration between teachers and students, student collaboration* and *peer tutoring* contributed to enhanced learning using the Internet. The findings indicate the Internet training of 11 teachers conducted at Elizabeth Macarthur High School contributed to enhanced teaching and learning after the teachers who participated in the study implemented the use of Internet in the classroom. The teachers observed that student’s research projects were enhanced, the quality of essay writing did improved and exploration methods of students improved after implementing the use of the Internet in the classroom.

As a summary, the use of emerging tools of information technology in school, such as the Internet, e-mail, newsgroups, etc. offers real opportunities for enhance teaching and learning. The use of on-line lessons can be an additional tool/strategy for teaching and learning.
4.3 Whole School Survey on the Implementation of Computer Technology at the school selected for the study. (Questionnaire Number 2, Q1, Q2 (a, b, c, d, and e), Q3 (a, b, c, d, e, f, g, and h) and Q4.)

Questionnaire Number 2 was designed to determine the success of the implementation of computer technology at the school selected for the study. The first question asked about what are the key influences in the implementation of Internet Policy at the sample school. The second question was aimed at determining how the school executive successfully implemented the Internet Policy. The third question asked about the views and beliefs on the implementation of professional development program of teachers in computer technology and Internet training at the school. The last question was designed to express the feelings and concerns in the implementation of Internet Policy at the sample school.

The principal of the school granted permission for the researcher to conduct a survey of the whole school in June 22, 1998. The study included 50 teachers who were given a consent form to participate in the study. Thirty two percent returned the answered questionnaire in June 26, 1998. The study included teachers, school executives, head teachers and ancillary staff from across the different subject areas.

See Appendix C to view the complete questionnaire that refers to the succeeding questions and tables.
Question. In the implementation of the Internet Policy at the school selected for the study, what do you think were the key influences?

This question was designed to find out what teachers believed were key influences in the successful implementation of the Internet Policy. Ten items were listed in Table 15, the participating teachers ranked each item according to the degree of influence. Results of the data from the table below revealed that teachers believed teacher training is the greatest influence in the implementation of the Internet Policy, followed by access to computer. Technology support was third on the list. The teachers believed they were the major key influences in the successful implementation of the Internet Policy at school selected for the study.

Table 15

<table>
<thead>
<tr>
<th>Item</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>classroom management</td>
<td>10</td>
</tr>
<tr>
<td>teacher training</td>
<td>1</td>
</tr>
<tr>
<td>access to computer</td>
<td>2</td>
</tr>
<tr>
<td>technology support</td>
<td>3</td>
</tr>
<tr>
<td>whole school support</td>
<td>4</td>
</tr>
<tr>
<td>teaching strategies</td>
<td>5</td>
</tr>
<tr>
<td>monitoring students using the Internet</td>
<td>7</td>
</tr>
<tr>
<td>networking</td>
<td>8</td>
</tr>
<tr>
<td>school executive implementation process</td>
<td>6</td>
</tr>
</tbody>
</table>
Question 2. Do you believe the school has successfully implemented the Internet Policy at the school selected for the study?

This question was elaborated with 5 sections so that participants could clearly identify the issues/items included in the sub-questions. The participants were asked to answer ‘yes’ or ‘no’. If the answer is ‘yes’, they were asked to encircle one of the letter choices listed.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

The sub-questions were:

a) The whole school (students, teachers, administrative staff, parents) is aware of the Internet Policy being implemented at the school.

b) The Internet Policy at the school is clearly defined for student access.

c) The Technology Committee worked collaboratively on issues relating to the Technology Plan Implementation at the school selected for the study.
d.) The school executive has a strong leadership role (management, educative and transformational) in the implementation of technology at Elizabeth Macarthur High School.

e.) The school has been equitable in meeting the hardware and software needs of teachers and students.

Table 16 showed the responses of participating teachers in question 2: 44 % of the sample answered ‘no’, 38 % said ‘yes’ and 19 % were undecided.

Table 16

<table>
<thead>
<tr>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Undecided</td>
</tr>
</tbody>
</table>

a.) The whole school (students, teachers, administrative staff, parents) is aware of the Internet Policy being implemented at the school.

Sub-question 4.a attempted to find out if the whole school is aware of the Internet Policy being implemented at the school. Table 17 showed that the whole school is divided in their response. 25% agreed, 25% were undecided and 31% disagreed.
Table 17

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>6%</td>
</tr>
<tr>
<td>A</td>
<td>25%</td>
</tr>
<tr>
<td>U</td>
<td>25%</td>
</tr>
<tr>
<td>D</td>
<td>31%</td>
</tr>
<tr>
<td>SD</td>
<td>13%</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

b.) The Internet Policy at the school selected for the study is clearly defined for student access.

Sub-question 4.b attempted to find out if the Internet Policy has clearly defined rules and expectations for student access. The alternative offered were: no student will operate until an Internet Code of behaviour has been signed with the appropriate card, letter of consent from parents allowing their children to use the Internet at school, students will not access any chat line unless directly supervised by a teacher, individual students will not generate their own e-mail accounts while using the school’s computers unless authorised and supervised by a teacher and no inappropriate material to be accessed. See Appendix F for sample Internet Policy of the sample school.
Table 18 showed that the teachers agreed the Internet Policy at the sample school is clearly defined for student access, which is indicated by twenty five percent (25%). However, 25% were undecided.

Table 18

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>25 %</td>
</tr>
<tr>
<td>A</td>
<td>25 %</td>
</tr>
<tr>
<td>U</td>
<td>25 %</td>
</tr>
<tr>
<td>D</td>
<td>19 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

c.) The Technology Committee worked collaboratively on issues relating to the Technology Plan Implementation at the school selected for the study.

The purpose of this sub-question was to find out whether teachers believed the Technology Committee at the sample school worked as a team and implemented the Internet policy within the school. The school had members of the Technology Committee drawn from across the Key Learning Areas and met regularly every second week of the month to oversee the planning and implementation of technology programs in the school. The whole school was provided a Technology Plan for a period of 2 years from school year 1998 – 1999.
The data revealed that teachers believed the ‘Technology Committee’ worked collaboratively (63%).

Table 19

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>19 %</td>
</tr>
<tr>
<td>A</td>
<td>63 %</td>
</tr>
<tr>
<td>U</td>
<td>6 %</td>
</tr>
<tr>
<td>D</td>
<td>6 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

d.) The school executive had displayed strong leadership role (management, educative and transformational) in the implementation of technology at the school selected for the study.

The school executive was comprised of head teachers, a leading head teacher, and the deputy principal and principal. The sub-question was designed to find out if teachers believed the school executive had displayed strong leadership in the implementation of technology within the school. The survey shows that the majority of teachers were undecided, as indicated by 38 %.
Table 20

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>6 %</td>
</tr>
<tr>
<td>A</td>
<td>13 %</td>
</tr>
<tr>
<td>U</td>
<td>38 %</td>
</tr>
<tr>
<td>D</td>
<td>19 %</td>
</tr>
<tr>
<td>SD</td>
<td>13 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

e.) The school has been equitable in meeting the hardware and software needs of teachers and students.

This question was aimed at finding out about what teachers believe about meeting the hardware and software needs of students and teachers in an equitable way. 50% of the teachers were undecided.

Table 21

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>12 %</td>
</tr>
<tr>
<td>A</td>
<td>12 %</td>
</tr>
<tr>
<td>U</td>
<td>50 %</td>
</tr>
<tr>
<td>D</td>
<td>6 %</td>
</tr>
<tr>
<td>SD</td>
<td>20 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree
Question 3. A Professional Development Program of teachers in Computer Technology and Internet training had been implemented at the school selected for the study. Please indicate your own view about the following statements by encircling one of the letter choices next to each of the following statements.

Participants were asked to choose statements, which best match, their view. A professional development program in Computer Technology and Internet Training had been implemented in the sample school. The researcher wants to find out if the following issues were being met or addressed by the school. The issues related to this question above are listed below.

a. All if not most teachers need computer technology training as clearly stated in one of the key strategies of the Government’s Computer Policy in Schools.

b. The school clearly identified the need for Internet Training for teachers.

c. Teachers need ongoing support with computer technology training.

d. Teachers should be provided by computers for loan to take home for further support of computer technology training.

e. Teacher with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.

f. The Computer Coordinator should have a major role in computer-based training for the school.

g. The school has a clearly defined Professional Development Training Plan in Computer Technology.

h. The school should provide Computer-Based Technology Training specifically
geared towards the use of computers in all Key Learning Areas.

i. The school should evaluate Technology Implementation in the form of an action research.

j. The school should have a software and hardware compatibility policy.

The participants used the following codes to answer the issues listed above.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

a.) All if not most teachers need computer technology training as clearly stated in one of the key strategies of the Government’s Computer Policy in Schools.
Table 22, shows 69% of the participants strongly agreed to this statement. They believed that teachers need computer technology training.

Table 22

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>69%</td>
</tr>
<tr>
<td>A</td>
<td>19%</td>
</tr>
<tr>
<td>U</td>
<td>6%</td>
</tr>
<tr>
<td>D</td>
<td>0%</td>
</tr>
<tr>
<td>SD</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

b.) The school clearly identified the need for Internet Training for teachers.

Table 23, shows that 63% of the participants agreed while 31% strongly agreed the school clearly identified the need for Internet training.

Table 23

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>31%</td>
</tr>
<tr>
<td>A</td>
<td>63%</td>
</tr>
<tr>
<td>U</td>
<td>6%</td>
</tr>
<tr>
<td>D</td>
<td>0%</td>
</tr>
<tr>
<td>SD</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree
c.) Teachers need ongoing support for computer technology training.

Table 24 shows that 69% of the participants strongly agreed that teachers at the school selected for the study need on-going support for computer technology training.

Table 24

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>69%</td>
</tr>
<tr>
<td>A</td>
<td>31%</td>
</tr>
<tr>
<td>U</td>
<td>0%</td>
</tr>
<tr>
<td>D</td>
<td>0%</td>
</tr>
<tr>
<td>SD</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

d.) Teachers should be provided with computers for loan to take home for further support of computer technology training.

The data in Table 25 shows the participants strongly agreed with this statement, 63% of teachers believing they should have a computer available for loan from the school to further support their computer training.
Table 25

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>63 %</td>
</tr>
<tr>
<td>A</td>
<td>31 %</td>
</tr>
<tr>
<td>U</td>
<td>6 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

e.) Teacher with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.

The data in Table 26 showed 44 % of the participants strongly agreed and 50% agreed that teachers with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.

Table 26

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>44 %</td>
</tr>
<tr>
<td>A</td>
<td>50 %</td>
</tr>
<tr>
<td>U</td>
<td>6 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree
f.) The Computer Coordinator should have a major role in computer-based training for the school.

Table 27 shows that 63 % of the participants agreed with this statement, the Computer Coordinator should have a major role in computer-based training for the school.

Table 27

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>63 %</td>
</tr>
<tr>
<td>A</td>
<td>37 %</td>
</tr>
<tr>
<td>U</td>
<td>0 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree


g.) The school has a clearly defined Professional Development Training Plan in Computer Technology.

Table 28 shows 63 % of the participants strongly agreed with this statement. They believed that the school had a clearly defined policy and rules in computer technology training. This was supported by the on-going technology training conducted by the members of the Technology Committee of the school.
Table 28

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>63 %</td>
</tr>
<tr>
<td>A</td>
<td>31 %</td>
</tr>
<tr>
<td>U</td>
<td>6 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

h.) The school should provide Computer-Based Technology Training specifically geared towards the use of computers in all Key Learning Areas.

Table 29 shows 63 % of the participants strongly agreed with this statement. They strongly believed that computer-based technology training should be for the whole school and not only for specific faculty areas.

Table 29

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>63 %</td>
</tr>
<tr>
<td>A</td>
<td>31 %</td>
</tr>
<tr>
<td>U</td>
<td>0 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>6 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree
i.) The school should evaluate Technology Implementation in the form of an *action research*.

Table 30 showed 50% of the participants agreed with this statement. The teachers believed that monitoring and control in the form of survey and questionnaires should be carried out to evaluate the success of the implementation of computer technology within the school. They believed that feedback is important whenever there is a technology program being implemented.

Table 30

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>35 %</td>
</tr>
<tr>
<td>A</td>
<td>50 %</td>
</tr>
<tr>
<td>U</td>
<td>15 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

*Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree*

j.) The school should have a software and hardware compatibility policy.

Table 31 shows that the participants strongly agreed with this statement (56 %). They believed the school should have the same platform of hardware and software so that they can use computers in the library, computer labs and staff rooms.
Table 31

<table>
<thead>
<tr>
<th>Code</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>56 %</td>
</tr>
<tr>
<td>A</td>
<td>19 %</td>
</tr>
<tr>
<td>U</td>
<td>25 %</td>
</tr>
<tr>
<td>D</td>
<td>0 %</td>
</tr>
<tr>
<td>SD</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Note: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

Question 4. Please indicate if you have some concerns, recommendations and problems in the implementation of Internet Policy at the, i.e., access to computers, classroom management, technology support, time to undergo training, compatibility of software and hardware.

The above question was aimed at determining the general feeling of teachers on the implementation of the Internet Policy at the school selected for the study. The teachers expressed their views/feelings and concerns about how computer technology is managed and administered by the school executives. The data presented in this question reinforced the findings in Questions 2 and 3 of this questionnaire, on issues like: staff development in computer technology, computer lab access, lack of time to learn how to use hardware and software and management and leadership style of executives within the school.
The comments listed below were extracts from comments of teachers involved in the study.

- An ongoing in-service in computer awareness and implementation is highly recommended.
- Lack of student access is still a problem.
- Specific professional development for staff is limited.
- Unaware of access to computers...head teachers should provide details for each faculty through computer-coordinator.
- Time is a concern. Teachers are impatient to get the training required to take classes to the new computer room. Teachers will not become confident until they get the experience. They are not getting the experience because they are not yet competent... hence the paradox.
- No facilities when you need it.
- Needs are not stated in subjects overall.
- Difficulty with attending school training. If it is a priority, then in-service time should be given during School Development Days rather than the ad-hoc approach at the moment. It will be better once the computer room is networked. At the moment there is no real access for classes other than computing to the computer rooms.
- The book sheet to the computer room needs to clearly be available with schedule classes clearly marked.
- Technology training involves classroom lessons on using the Internet to ensure information and students can collect data more easily to meet needs.

- For teachers time is the constraint. Each faculty needs Net access for research.

- The executive have little/no input, poor management.

- The school has not been equitable in meeting the hardware and software needs of teachers and students. The issue is not made important enough.

- The Computer Co-ordinator should have a major role in computer-based training in the school, if capable. Yes. If not capable, a person or persons on staff should be identified by the executive and given this role on allocated time.

- Computer technology in our school is poorly managed. A group of volunteer committee members with limited expertise in many cases make major decisions.

- Executive input is limited or not invited on a number of occasions. I have attempted to raise this matter.

The concerns listed below were extracts from comments of teachers involved in the study.

- We have a super computer room promised to be available to staff from beginning of 1998 still not functioning...extremely frustrating.

- Students have very limited access to equipment and specially the Internet. Printers not available.
• No attempt to investigate level of technology in our feeder school rather than assumption that year 7 knows nothing.

• Poor organised committee.

• In servicing ...No planning and no equity, some in school and some out of school.

Teachers were asked to present their recommendations about their view of their experiences. Listed below is a range of these.

• All executive should have meetings aimed at discussing own faculty levels of Competence.

• Vision for faculty... what or how will you use technology in your faculty, requirements like: in-service, software/hardware, other resources, electricity, furniture.

• All executive requirements should be mapped into whole school plan over three years.

• All school stakeholders should have a representative on the committee. It should be compulsory including office staff and student bodies.

• Head of the Technology Committee could and should be elected.

• A much more business approach should be given to resource purchases. Maintenance should be built-in.

• A common platforms and programs identified.
• We have but one chance at this money and time (valuable resources). These are being wasted. Technology is everybody's business. Technology is not a faculty. Technology is every faculty's responsibility. I have never been asked what I require, what is my vision. What vision I see for the school. This is extremely poor and very frustrating.

• All computer room timetables should be published and presented to all head teachers, day one each year to foster and enhance access across the whole school.

The views, concerns and recommendations expressed by the teachers from the above extracts had some relevance to what teachers' believed as a result of the findings in Questions 2 and 3 of this Questionnaire. The teachers' highlighted the need for ongoing staff training in computer technology, better computer access for both students and teachers, time to learn the use computer hardware and software, technology support, a common platform of computer hardware, equitable distribution of computer hardware and software in all faculty areas and school executives' management and leadership role in the implementation of technology programs in the school. Based on these concerns and recommendation of what teachers believed to be important in the successful implementation of the Internet Policy in the school, these could form a basis to answer the research questions of this study.
Analysis:

The data collected and presented in the above discussion of Questionnaire Number 2, Q1, 2, 3 and 4 forms a basis to answer two key research questions of the study: a.) What are the implementation strategies that exist in the school selected for the study for gaining acceptance in the introduction of the Internet Policy? and b.) How does the school executive implementation process (support) impact on the successful implementation of the Internet at the sample school? The questionnaire was a whole school survey on the Implementation of Computer Technology at the school selected for the study. This was conducted 5 months after the Internet Training of teachers. It was designed to obtain the views and attitudes of a wider circle within the school community on computer technology being implemented at the school selected for the study. The questionnaire was divided into 4 questions. The questions of Questionnaire Number 2 are listed below.

**Question 1.** In the implementation of the Internet Policy at the school selected for the study, what do you think were the key influences?

**Question 2.** Do you believe the school has successfully implemented the Internet Policy in the school? (this question has 5 sub-questions)
**Question 3.** A Professional Development Program of teachers in Computer Technology and Internet training has been implemented at the school. Please indicate your own view about the statements by encircling one of the letter choices. (this question has 10 sub-questions)

**Question 4.** Please indicate if you have some concerns, recommendations and problems in the implementation of Internet Policy in the school, i.e., access to computers, classroom management, technology support, time to undergo training, compatibility of software and hardware

After careful analysis of the data presented in this questionnaire, the following results reflected the views, feelings and beliefs of the teachers in the sample study. The first question was designed to determine the key influences to the successful implementation of the Internet Policy at the school selected for the study. Teachers were asked to rank 10 items according to the degree of influence: teacher training, access to computer and technology support appeared as key influences. The second question was aimed to determine if the school executive had successfully implemented the Internet Policy of the school. The teachers believed that the Internet Policy was successfully implemented by the school executive through the following strategies: the Internet Policy of the school selected for the study had clearly defined rules and expectation for student access and the Technology Committee worked collaboratively on issues related to technology implementation. Question 3 was aimed at determining if the Professional Development Program of Teachers in Computer
Technology and Internet Training had been implemented at the school. The teachers believed that the professional development program of teachers in computer technology and Internet training had been implemented. They were provided with 10 issues and asked to indicate their views on each of them. They felt that teachers need computer technology training and could be an on-going program. They believed the school clearly identified the need of Internet training for teachers and should provide computers for loan to take home for further support of computer technology training. The school had a clearly defined (a) Professional Development Training Plan in Computer Technology and (b) policy and rules in computer technology training. The teachers view on school software and hardware compatibility policy was supported by their strong belief indicated by the findings of this questionnaire. The fourth question was aimed at obtaining the teachers concerns, recommendations and problems in the implementation of Internet Policy at the school selected for the study. The participating teachers expressed their concerns about staff training, time to learn new technologies, computer access and networking, school executive support and common computer platform.

In summary, the findings and data in Questionnaire No.2, answered 2 key questions mentioned earlier. Results of the study revealed the following aspects.

There were clearly defined implementation strategies that exist at the school selected for the study for gaining acceptance in the introduction of the Internet Policy. The school executive implementation process had an impact on the successful
implementation of the Internet Policy at the sample school. The participating teachers believed: the school clearly identified the need for Internet training for teachers, the school had a clearly defined Professional Development Training Plan in computer technology and the school clearly defined their policy and rules in computer technology training. Based on results of the data in Questionnaire 2 and what participating teachers believed, clearly defined implementation strategies in computer technology and school executive support had a significant impact to the successful implementation of the Internet Policy of the school selected for the study.

4.4  Personal Interview (Interview Questionnaire)

The questionnaire was designed to consolidate the results gathered from the survey questionnaires (Questionnaire 1, Part 1 & 2 and Questionnaire 2) and to formulate recommendations to improve the effectiveness of the implementation of Internet Policy at the school selected for the study. The interview was conducted after the survey. Participating teachers were personally interviewed and their answers were recorded. There were 10 interview questions. The participating teachers in the interview were asked how they would like in-service training to occur and what time this could take place. They were also asked to identify the strategies necessary to successfully implement the policy. There were 5 people interviewed. (N = 5). S1, S2, S3, S4 and S5 correspond to the sample number of the teachers participated in the interview.
See Appendix D to view the complete questionnaire.

The personal interview questions are listed below followed by the responses of the teachers participated in the interview.

Question 1. From the result of the survey, in-service training ranked number one as the key influence in the Implementation of Internet Policy at the school selected for the study. How would you like in-service training to occur at the school?

Can you please choose your answers from the following and give your reasons for it?

a.) after schools hours

b.) during professional development day

c.) during school hours with relief periods

if so,

1.) do you prefer long-term training until teachers are confident to use the Internet?

or

2.) do you prefer short-term training because of time factor?
Answers 1.1

S1. Needs to be across KLA and should be available for everyone. I think we need to encourage people with experience teachers for training. Younger teachers need to be encouraged. It should be done professionally meeting the needs of the students. Should be done in faculty basis. Should be encouraged from the top. Important to have school perspective. Good if Head Teachers have policies in the Internet.

S2. Need to understand how it works, need to train one faculty at a time, extra training for a representative from each faculty train them if of the view that they help their faculty, ongoing training for the rest of the faculty/staff.

S3. Force people to use computers. Be given work related projects. Force to research to feel more comfortable.

S4. The school provided a lot of training for teachers. When you need help you always have to go to people who have expertise. Time factor is an issue.

S5. Training has to be out of school for few weeks (one afternoon a week), short sessions, room free, resources and time.

Answers: 1.2

S1. Combination of all, i.e. a, b & c. For other people training should be out of school.

Professional development day could be used and planning should be done.

S2. a & b

S3. b & c
S4. a, b & c. But there are limited resources. For some people it is a waste of time, some
people need only basic things. People don’t turn up because of time constraint.

S5. c, but not practical

Answers: 1.3

S1. Long-term training; however it is different for different people because of
opportunity.

S2. Yes, long term training until they are comfortable to use the Internet.

S3. Long-term training but short term for some people.

S4. Short-term training, doing it yourself.

S5. Long-term training is good but at school short term training is good.

Analysis:

Based on the responses of the participants on the question above, they believed that
in-service training should happen after school hours, during professional development
day and during school hours with relief periods. They would prefer in-service training
in the Internet at the school to be across the Key Learning Areas. It should be
available for everyone and encourage experienced teachers in technology to train
other members of the staff. The training should be done professionally, meeting the
needs of the teachers on a faculty basis. A majority of the teachers who participated in
the interview prefer long-term training until they are comfortable to use computers.
Question 2. What do you think are some strategies to successfully implement the Internet Policy at the school selected for the study?

a.) through the leadership of Head Teachers

b.) whole school support, i.e. teachers get more involve in the implementation process

c.) or both

d.) others, specify

Answers:

S1. c (or both)
S2. c (or both)
S3. c (or both)
S4. c (or both)
S5. B, whole school support

Analysis:

Most teachers who participated in the interview believed that in order to successfully implement the Internet Policy in the school, the Head Teachers should play an active role in implementing the policy in their faculty areas by (a) assisting the teachers to plan and prepare lessons incorporating the use of the Internet and (b) allocating time
for Internet training. Another strategy they believed should be helpful is by involving teachers in implementing such policy. The teachers also believed that whole school support like teachers, students, executives and the wider community to work as a team in the implementation process of the Internet Policy at the school.

**Question 3. The whole school (students, teachers, administrative staff, parents) is not aware of the Internet Policy being implemented at the school as indicated by the survey.**

a.) Do you think the principal should clearly give responsibility to the Head Teachers to assist in the implementation of the Internet Policy?

b.) Do you think that the P&C should assist in passing information to parents of students in the school?

c.) Do you think that teachers and students pay attention to important policies such as the Internet Policy and not just put it aside because the Principal has clearly announced in school staff meetings, hand out document policy of the Internet at the school and also published it in the school newsletter. You can choose your answers to any of the above or combination of them. Support your answer if you think it is necessary.

**Answers:**

S1. a, through school newspaper (MACHAT) and P & C. Communication problems
comes from the individual. There should be strong leadership.

S2. I believe that the result of the survey is correct.

a.) I don’t think it should be the responsibility of the Head Teacher, however it is the responsibility of every teacher because some head Teachers are against the implementation of the Internet Policy.

b.) Yes, P & C and school community should be made aware about the Internet Policy through meetings and school newspaper.

c.) The principal should keep enforcing the advantages of the use of the Internet/Intranet.

S3. a. yes, b. yes, c. needs to be explained to the whole school, every students need to be taken to the computer room. There should be a policy to help people use it properly.

S4. We are all aware of the Internet Policy but difficult to implement, like time factor. So many policies in the school.

S5. The information has not filtered down.

Analysis:

The teachers who participated in the interview agreed with the items in Question 3. They believed that the results of the survey were accurate and hence there should be strong leadership from the principal. The P & C and school community should be made aware through meetings and the school newspaper. The teachers also believed that it is not only the responsibility of the Head Teacher but also every teacher’s
responsibility to implement the Internet Policy at the school. The teachers interviewed believed that members of the school are aware of the Internet Policy but it is difficult to implement because of limited time. The participants made comments that there are so many policies in the school and it is difficult to cope with and implement them all.

Question 4. What do you want to see happen so that the school executive will have strong leadership in the implementation of technology.

a.) The principal, deputy principal, leading teacher and head teachers should have an active role in the implementation of technology.

b.) Teachers, head teachers and the principal should work as a team to achieve a common goal for technology implementation.

c.) The principal should make the teachers aware of the need of computer technology in teaching and learning, i.e. computer technology is no longer a choice but it is a tool and a must in every day existence hence in teaching and learning.

d.) All of the above

Answers:

S1. d (all of the above)

S2. b & c

S3. d (all of the above)
S4. It fails people, don’t have time, few teachers are active in using computers, no enough computers

S5. b & c

Analysis:

Majority of the teachers who participated in the interview believed that the school executive should have an active role in the implementation of technology and the whole school should work as a team. The teachers believed that the principal should make the teachers aware of the need of computer technology in teaching and learning.

Question 5. The result of the survey is undecided if the school has been equitable in meeting the hardware and software needs of teachers and students.

a.) Do you think that all teachers should be provided with a list of inventory of software and hardware?

b.) Not all teachers at the school are computer technology literate, do you think there should be a staff meeting to explain and in-service the teachers about hardware and software needs, equity, etc.?

c.) or both
Answers:

S1. c (both)
S2. c (both)
S3. b
S4. too idealistic but we cannot afford it.
S5. c (both)

Analysis:

The participants strongly believed all teachers in the school should be provided with an inventory of software and hardware. A list of computers and available software that are currently used in the school should be handy for teachers. This could become a basis for them to know what priority needs in software and hardware they could purchase for their Teaching tools. They also believed that in-service training for teachers should be provided to discuss hardware and software needs of the school.

Question 6. Teachers need ongoing support in computer training as strongly suggested by the survey. Do you think computer training should be done in a regular basis? If so, by whom?

Answers:

S1. Someone with expertise and not necessarily from computing or outside school.
S2. No, but it should be ongoing and catered for individual needs. It should be flexible.

S3. Regular basis and by head of departments or an expert in the department.

S4. All different levels when someone needs help.

S5. It should be ongoing.

Analysis:

The participants believed that computer training should be done on a regular basis. It should be an on-going program to cater for individual needs. The trainer should have computer technology training and could either be an experienced teacher from the school or an invited technology person from the school district.

Question 7. Teachers should be provided by computers for loan to take home for further support of computer technology training. Do you think this is happening at the school? If so, please support your answer.

If not, what is stopping the school from doing it.

a.) no computers available for loan
b.) the school has not look into computers for loan

Answers:

S1. Loan should be available as long as someone must take record, b.)

S2. b, the school has looked into laptop arrangements but currently we only have few.
S3. b, not enough laptops to take home.

S4. Already in placed

S5. There are computers for loan, only few teachers know about it.

**Analysis:**

As commented by the interview participants, a computer for loan program was already in place at the school selected for the study, though there were not enough laptop computers available to take home. The teachers believed that computer lending should be available, if managed effectively.

**Question 8. Survey shows that the Computer Co-ordinator should have a major role in computer-based training for the school.**

a.) Do you think this is happening in the school? Please support your answer.

b.) if so, does the Computer Co-ordinator has a Technology Plan in placed for technology training of teachers?
Answers:

S1. a, training by the Computer Coordinator gave good background to teachers

People with expertise, get more people involved. Agree - but as long as the person knows how to do it. It is a whole school issue. Responsibility not by the computer teachers.

S2. b, a group of people with diverse expertise should be able to train and support teachers across many facets of technology training.

S3. There has been a lot done in computer technology training. A coordinators work should be a department head.

S4. They are already doing it.

S5. We had a Technology Plan last year but it has not been really followed up.

Analysis:

The participants believed that while the school has implemented computer-based training through a Technology Plan, such practices have not been properly administered. The participants responded positively to the amount of computer technology training available. Responses were also positive towards the Internet training given by the computer coordinator, as such training was useful for classroom teaching.
Question 9. The school has a clearly defined Professional Development Training Plan in Computer technology as revealed by the survey, what do you think is stopping the teachers from undergoing such training? Please specify.

Answers:

S1. Fee, lack of understanding, lack of encouragement, don’t see the relevance for their subject. Attitude of teachers to computer technology.

S2. Lack of knowledge utilising/using technology in the classroom, administration and reporting on students.

S3. Lack of enforceable requirement.

S4. Overburdened, time factor

S5. Possibly that is has to be held after school, some people are reluctant to embrace technology.

Analysis:

Based on the participants' responses, the following paragraph outline factors, which influence the reluctance of teachers to undergo training. These are: the belief that teacher lack requisite understanding of computer usage; lack of executive encouragement; perceived irrelevance for certain subjects; lack of administration and student monitoring; the overriding demands of school work and general attitudes of negativity towards computer technology within the school community.
Question 10. The survey showed that the school should provide Computer-Based Technology Training specifically geared towards the use of computers in all Key Learning Areas. How can this be addressed? Please give some strategies.

Answers:

S1. Access consultants, various KLA come to school to speak to faculties

S2. Regular investigation of looking to KLA, which provide how to teach and administer lessons.

S3. Subject specific training and examples on how it can be used in the classroom.

S4. Have few website addresses related in your KLA's

S5. In every faculty there is at least competent in technology, it will be a matter of using this people. If there is money let the people develop curriculum.

Analysis:

The survey showed that participants believed the ‘school should provide Computer-Based Training’ specifically geared towards the use of computers in all Key Learning Areas. The teachers who were interviewed believed ‘it is not only the computer technology expert in the school who can assist in the training’ but also outside experts like Technology Consultants in various Key Learning Areas should come to school to speak to faculties.
Summary

The result of the interview question reinforced the findings in the previous questionnaires. The participating teachers in the Internet Training, the whole school survey and the personal interview all highlighted the same beliefs and feelings about the implementation of Internet Policy at the school selected for the study.

The findings of the personal interview revealed the following aspects of teachers' beliefs.

- The Professional Development Program in computer technology should be an on-going program.

- To successfully implement a Technology Policy, the school executive should play a strong leadership role.

- Technical support should be provided to teachers and the school executives should address equity issues.
Chapter 5

CONCLUSION

5.1 Conclusion

The final chapter represents a summary of the findings of this study. The study attempted to find what clearly defined implementation strategies existed in the school, how teacher training in the use of the Internet could enhance teaching and learning and what was the school executive’s impact on the successful implementation of Internet Policy.

These conclusions are presented under the headings of relevant research questions followed by final comments and recommendations. The key research questions were:

Q1. What are the implementation strategies that exist in the school selected for the study for gaining acceptance in the introduction of the Internet Policy?

a. Is there a Technology Plan at the school?
b. Is the Internet Policy at the school fully implemented?

c. Is the whole school (students, staff, teachers and parents) aware of the need for an Internet Policy?

Q2. How does teacher training in the Internet enhance learning and teaching?

Q3. How does the school executive implementation process (support) impact on the successful implementation of the Internet Policy?

Questions and answers

Q1. What are the implementation strategies that exist in the school selected for the study for gaining acceptance in the introduction of the Internet Policy?

   a. Is there a Technology Plan at the school?

The school has had a Technology Plan since 1998 (see Appendix E). A Technology Committee composed of teacher representatives from each faculty area and executive staff, undertook the planning and implementation of the policy. The Technology Plan paid particular attention to four areas, namely (1) skills, (2) management, (3) administration and (4) networking. The brief of the committee further included formulation of policies on staff
training in technology, acquisition and allocation of hardware and software, planning and overseeing network, access to computer rooms and other facilities, and measures for technology integration in teaching and learning. Debrency and Ellis (1997) have argued in a study that is related to the successful implementation of a technology plan, that preconditions for successful implementation of a university’s plan are analysed in the context of a critical success factors (CSF’s) framework. Such factors for a good technology plan are those related to curricula, namely, management of learning, technology-based innovative teaching approaches and matching student resources and competencies to institutional resources.

Cuttance and Nicholson (2000) in their research, describe the context, significance and methodology of the Deakin University, University of Sydney and Victorian Department of Education, Employment and Training Victoria ‘Successful Integration of Learning Technologies’ collaborative research and development project. Their research was a three-year project, jointly funded by the Australian Research Council and DEETV, which sought to identify examples of the integrated use of learning technologies that have led to demonstrable improvement in student learning outcomes. The Successful Implementation of Learning Technologies (SILT) research project was focused on addressing technology-based learning by identifying, documenting, and developing replicable models of the implementation of learning technologies that lead to verifiable improvements in student learning
outcomes. According to the authors, the "development of such models will help to ensure that the conditions under which the classroom use of technology leads to improved learning outcomes will be clearly described and conceptualised into a useable curriculum model." The models that were developed from this project may not necessarily result in a definitive theoretical model of the successful use of ICT in classrooms, but will contribute to it by articulating what they see as critical components of such a theory, and also provide teachers with refined and tested models of successful use of ICT. The study made by the above authors is a nationwide research model of the implementation of learning technologies to improve student-learning outcomes. Another study that is related to technology planning and implementation was conducted by Fluck, (2000), "Technology Planning for the New Millennium:

Some national and state approaches to integrating IT in education." His paper presents findings from a study of four nations, including Australia. The countries included in the study have taken a different approach to the policy-coordination of classroom computing, teacher professional development and IT infrastructure management. According to the author, the evidence accumulated during the data-gathering exercise, appear to be three stages through which countries progress as computers become more prevalent in education. They are as follows:
"**Phase 1:** where students in school first use computers, and information technology becomes a curriculum choice."

"**Phase 2:** where information and communication technologies are used transparently to enhance learning opportunities in all conventional curriculum subject areas."

"**Phase 3:** where the universal curriculum clearly includes topics of study that would not exist without information and communication technologies, and schooling for most students no longer fits the conventional model." (p. 4)

Fluck stated in his study that:

"*Funding has been allocated to give each teacher approximately AU$ 1,400 worth of training over the period 2000-2001. This targeted training is subject-based, and should show teachers how to successfully integrate IT into their area of expertise. The critical elements to achieve success in this transformation have included the revision of the National Curriculum to include ICT (information and communication technology) in every subject area, as well as definitions of the ICT skills requirements of pre-service and in-service teachers.*"

"*Most Australian States have similar initiatives in progress, such as the Technology in Learning and Teaching (TILT) program in New South Wales.* In Eugene, Oregon in the USA, students in regular schools had access to the Cyber School (Layton, 1999), which offers subjects that are not available locally or were inaccessible due to timetabling restrictions.*"

"*In Hong Kong, the Cyber Campus extends Internet access and e-mail accounts to all school students.*"
In Tasmania, the state distance learning organization and colleges with distance education responsibilities are developing web-based courses using central government funding initiatives.

"The development and take up of Internet-based educational opportunities has been swift, and points towards the start of Phase 3 in the above analysis." (p.4)

The Fluck study covers a global theme in the implementation of technology-based education. The countries involved in the study have a common theme as to the planning for technology education: teacher training, the Internet access of students, web-based courses, as well as definitions of the ICT skills requirements of pre-service and in-service teachers.

In summary, the three studies mentioned above have relevance to the technology plan of the school selected for study. In Debrency and Ellis, they argued a successful implementation of a technology plan in higher education. Cuttance and Nicholson's research on the Successful Implementation of Learning Technologies (SILT) Research Project, pointed out the research project is focused on addressing this problem by identifying, documenting, and developing replicable models of the implementation of learning technologies that lead to improvements in student learning outcomes. On the other hand, Fluck's study was global in nature and the countries included in the study shared the same technology issues in planning and implementing.
b. Is the Internet Policy at the school fully implemented?

The teachers believed that the Internet Policy was successfully implemented by the school executive as revealed by their collaborative work in planning and implementing the Internet Policy of the school and issues related to the wholesale adoption of technology programs. The school has had an Internet Policy in place, which served as a guideline for students' access to the Internet. Clearly defined rules and expectations were outlined in the Internet Policy of the school. A professional development program of teachers in computer technology and Internet training had been implemented at the school and this program identified and outlined issues like: a.) The need for Internet training for teachers, b.) policy and rules in computer technology training, c.) on-going support of computer technology training for teachers and d.) provision of computers for loan to teachers.

To support the above findings, the literature review in p. 10, (Cunningham, 2001) has relevance to this topic. As Cunningham stressed in his study, a successful implementation of government programs on technology use calls for a comprehensive and long-term professional development program for teachers. This type of training could encompass valuable changes in the teachers' pedagogy. Pouring massive amounts of funding into hardware and software and into the connection of all schools to the Internet is not adequate to address issues confronting the schools technology implementation. The
paper also argues that the school (students and teachers) should be provided with comprehensive technical support and ready access to computers when needed. Teachers should be up-to-date with technology changes to match-up their curricula and teaching strategies.

In the review of literature, Goodridge's study on the role of the community in providing technology support and implementation in rural schools supported the finding of this study. The collaboration between the schools and the community is a success story in this program. Goodridge's study has significant implication in the management, professional development and implementation of a technology program. In his study, there was evidence of support of funding from across the community with the involvement and contribution, not only in funding but teacher training and volunteer support.

The technology training of teachers normally done by the school is not the same in this case. A technology corporation took the initiative and responsibility in training teachers in the use of computers and its associated discipline. This venture took out some of the problems of the schools in teacher training. As a corollary to this, the technology initiative was a success, however it was pointed out that the bulk of the task rests in the hands of the school administrators in the implementation and management of such program. Hardware and software maintenance is an on-going process as they
can be outdated. To this effect, the school executives need to have technology programs to address this issue.

The two studies gleaned from the literature review of this research are conducted from a larger perspective, however, their findings send a unified message as to the successful implementation of technology programs in school districts. The two studies stressed the importance of professional development of teachers in technology, access to computers, connecting schools to the Internet, acquisition of hardware and software, and the provision of technical support. These studies supported the findings of the research question above.

c. *Is the whole school (students, staff, teachers and parents) aware of the need for an Internet Policy at the school?*

The result of the survey indicated that the teachers had mixed feelings about this question. To overcome this problem, the teachers strongly recommended that there should be strong leadership by the principal and involvement of the head teachers and all teachers to make the whole school aware of the need for an Internet Policy. Such awareness could be achieved through P & C (Parents and Citizens) meetings and publication in the school newspaper. The teachers interviewed believed that members of the school were aware of the need for an Internet Policy but it is difficult to implement because of limited time. There
were many school policies to cope with and implementation of such policies were difficult to implement at the same time.

One of the recommendations of the teachers involved in this study is that a strong leadership by the principal is required to successfully implement technology programs. A significant item of the literature review that supports this research question is a study of Peterson and Solsrud (1997). They assert that principals could play an important role in the restructuring of schools but would need the involvement of teachers in the decision making process. The study shows that the whole school should work collaboratively to successfully implement policies and programs such as those technology initiatives.

The study conducted by the above author significantly contributed to the findings of this inquiry. This research is similar to the results to the findings of the literature mentioned in terms of the importance of the leadership role of the principal in implementing policies and the restructuring of schools. The research findings and the literature further emphasize the need for whole school involvement, particularly teachers in the decision making process to plan and implement technology programs. The collaboration between teachers, school leaders and parents could make the whole school community aware of the needs for technology initiatives.
Q2. How does teacher training in the Internet enhance learning and teaching at the school?

This question was designed to find out about the “effectiveness of the Internet training” conducted in 3 sessions for 3 consecutive weeks in 1998. The teachers were asked how the training helped them in integrating the use of the Internet in their classroom teaching. Teachers believed that the Internet training helped enhance teaching and learning at the school. The teachers believed the research and inquiry skills of their students developed when using the Internet in the classroom. They believed the students’ writing skills also improved and the quality of students’ research projects were enhanced after using the Internet as a research tool. The teachers observed that students took responsibility for their own learning through collaboration with peers and teachers and locating websites on their own for research work. An example of this was a teacher of year 12 who used the Internet as a reference tool for his subject in a case study. The teacher asked the students use the Internet to gather information related to the topic. This gave them a variety of information to choose from and they were able to manage and use their time efficiently and effectively rather than ringing businesses to obtain information. Another teacher who participated in the study observed that the use of the Internet allowed the students to access more up-to-date information rather than relying on textbooks. Teachers also believed use of the Internet improved the exploration methods used by the students.
The studies investigated by Cunningham (2001), Goodridge (2000) and Russell and Russell (1997) has had a significant impact on the research.

Cunningham's (2001) recent study in the U.S.A., points out that about 1.3 million of the nation's 3 million elementary and secondary teachers feel only 'somewhat' or inadequately prepared to integrate educational technology into their teaching. The need for teacher training in the effectiveness of using technology in classroom was one of the major items investigated in his study. He asserts that successful implementation of the technology initiative demands comprehensive professional development that facilitates the necessary changes in teaching and learning. Cunningham's study is comprehensive as it addresses the potential of the use of computers and the Internet in the classroom. His investigation shows computers could simulate real-world experiences and they are productive tools that enable students to gather and learn from information more efficiently. Electronic workbooks also improve students' basic skills, enabling them to participate in higher levels of education as a result of the study. Computers serve as productive mind enhancing tools. The Internet acts as a repository for real-world data, images, text, and other resources. The students can access this vast information for data gathering and research. Cunningham found some associated pitfalls in his study like: many teacher training institutions fail to use computers effectively to train teachers and most teachers are unable to integrate technology into the curriculum in educationally significant ways even if teaching programs are computerized.
Goodridge (2000) examines the role of the community in providing support for computer and technology implementation in rural schools. Such support included technology training of teachers in schools. The technology program included weekend technology training classes for teachers by employees of Nortel Networks Corp., and gifts of computers and printers to the high school.

The studies conducted by the two authors significantly contribute to the findings of this study. This research has similarities to the findings of the authors mentioned in the effectiveness of teacher training in the use of computer technology and the Internet as they convey a clear message that teaching and learning was enhanced, the research capabilities of students developed using the Internet as a tool, basic skills such as writing skills developed, students took responsibility for their own learning when left alone to use the computer and data management of students developed using the Internet.

**Q3. How does the school executive implementation process (support) impact on the successful implementation of the Internet Policy at the school?**

This question was aimed at determining how the school executive support is likely to impact on the successful implementation of the Internet Policy of the school. The technology plan listed strategies about staff technology training, technology management administration and computer network, and a 2-year plan in 1998-1999. The plan was a result of the collaborative effort of members
of the Technology Committee. The Internet Policy of the school clearly identified rules and expectations of students' access to the Internet. These policies helped the teachers formulate their views and beliefs about strategies the school executives implemented in the school. The study revealed the Internet Policy of the school had clearly defined rules and expectations for student access; the Technology Committee worked as a team on issues related to computer technology implementation; the Professional Development Program of Teachers in Computer Technology and Internet Training had been implemented and the school clearly identified the need for Internet Training of teachers.

A couple of studies from the review of literature (Chapter 2) support the findings of this study for the research question. These are recent studies conducted by Cunningham (2001) and Khirallah (2001). Both researchers studied Information Technology Initiatives in schools in a statewide setting. Their studies have a common theme as they looked at the partnership and collaborative effort of technology businesses, non-technology businesses, volunteers, school principals, teachers, students and Information Technology Director. The authors included a number of schools that participated in the technology initiatives.

Cunningham's (2001) study looked at a joint venture technology plan in New Jersey, (in a school district that is relatively small) that includes a pre-packaged,
networked computer-based learning systems such as Compass-Learning, Computer Curriculum Corporation and Skills Bank. The collaborative network of technology businesses aim at enabling students to track their progress on basic skills or assign specific tasks to particular students. These technology initiatives are especially appealing to inner city or under performing schools because they require almost no changes in school structures. There is a major investment in teacher training like installation, running a computer lab and using the computer-based system with only one trained teacher who takes each class of students in turn. Computer maintenance is usually easy and handled with a simple contract between the vendor and the school because all the computers in the lab are generally identical and similarly configured.

The partnership and collaboration in this technology initiative has had a program in place for retraining teachers in school districts and building a full K-12 curriculum based on the use of technology. According to Cunningham, the program has produced measurable outcomes and the effort has paid off which is seen students' educational attainment. The school district has both corporate and state support for technology purchases; and it has a visionary director of curriculum who is committed to make long-term changes in the district's teaching and learning. Replicating that success widely would be difficult indeed (op.cit.).
The above study shows that collaboration and partnership among the key players in technology-based education is imperative. Also crucial is the full-scale support of teacher training in computer technology and the leadership role of the curriculum director in the implementation of technology initiatives.

The Khirallah (2001) study looked at the dependency of a high school located in low socio-economic background families in the New Jersey district. The study is a partnership and collaborative effort of business industries, insurance company, volunteer labour and the school. The companies involved in this comprehensive technology initiative are: Hewlett Packard, Cisco Systems, Cincinnati Bell and State Farm Insurance. The participating companies have “digital-divide” initiatives in place. They are engaged in many educational initiatives, with the desire to attract children to science and engineering and into solid technology careers, and have the digital-divide initiatives. They also have on-going strategic policy planning. A long-term strategy in this technology venture is present. Khillarah’s study focused in a large-scale technology program where disadvantage schools are involved compared to this research. In contrast to this research, Khillarah looked at the partnership and collaborative effort of community and the school while this study focused more in the collaborative effort of the technology committee in planning and implementing issues related to computer technology implementation. Khillarah had comprehensive technology initiative of teachers and students as well as technical support by big technology businesses. It had a continuous professional
development for teachers and educational initiatives to encourage children to pursue careers in science and technology. The difference of this research to Khillarah's study is, the strategic technology plan was only in place for a 2-year period. Teachers who had technology expertise as a part of their normal school duties conducted the teacher development program. There were no educational initiatives for students who wish to venture on science and technology courses.

In summary, the two studies explored collaboration, leadership, large-scale technology program, curriculum changes and teacher training initiatives.

The findings of this study may assist teachers, school executives, students, parents, educational leaders, policy makers and governments in planning and implementing computer technology programs in schools. The researcher answered the 3 key research questions using a "qualitative approach". Based on the results of this study, the researcher found out the clearly defined implementation strategies of the school selected for the study, how teacher training in the Internet enhanced teaching and learning and how the school executive support made an impact on the successful implementation of the Internet Policy of the school. This study could be a guide to similar studies related to computer technology. The school selected for the study is a government comprehensive high school, a large school with a population of 1112 students and 70 full time teachers during the time of the study. It was a relatively new school and had a strong leadership on issues related to computer technology and Internet Policy.
5.2 Summary

Results of the study answered the research questions posed and are supported by studies in the literature review.

Research question number one, shows that the school selected for the study had a Technology Plan in place since the beginning of 1998. The researcher found that the teachers believed the Internet Policy was fully implemented in the school.

The researcher found that teacher training in the use of the Internet enhanced teaching and learning through teacher’s observation and experiences in the classroom. This was a common theme highlighted in the studies by Cunningham (2001, p. 41), Goodridge (2000, p. 54) and Russell and Russell (1997, p.584). These studies found that the comprehensive professional development of teachers in computer technology correlates with effective computer usage in the classroom and the enhanced learning of students.

The researcher found that the teachers interviewed not only believe that classroom management strategies improved due to the teacher training, but students gained a range of benefits. This is illustrated in the beliefs that Internet training supported the development of researched and inquiry skills
among students. Findings also show that teachers believed that the use of the Internet enabled the students access to a variety of on-line resources when assigned research topics, thereby enhancing the research topics. This corresponds to Cunningham's findings, which demonstrates that research and data management by students were enhanced by the real-world simulation of experiences via the Internet (Cunningham, 2001).

Teachers also believed that students gained benefits in the broader areas of learning. Cunningham's assertion that teacher training in the Internet usage enhanced basic skills supports the findings that the general quality of essay writing improved due to the Internet training and usage.

Findings of the last research question shows that the collaborative effort of the Principal, school executives and teachers and the need for computer and Internet training are likely to impact on the successful implementation of the Internet Policy. The studies conducted by Peterson and Solsrud (1996, p.105), Cunningham (2001, p. 41) and Goodridge (2000, p.54) supports these findings. The research finding have relevance to Peterson and Solsrud's investigation that the principal's active role and teachers' involvement in the school's decision making process could impact on the successful implementation of school policies and programs such as those related to computer technology and the Internet. Although the studies by Cunningham and Goodridge focused on the large collaboration of school administrators,
technology companies and businesses, teachers, outside school volunteers and non-technology corporations, the implementation process reiterates the findings of this research question.

5.3. Suggestions and Recommendations

The researcher gives the following recommendations based on the results obtained from the investigation.

- Computer technology is a rapidly changing phenomena, schools should be aware of the development of these emerging technologies so they can integrate these tools in teaching and learning.

- On-line teaching and learning is now a tool in pedagogy; Internet Training should be made compulsory in every school. Training could be on Web page Design and On-line Publishing, Lesson Plan Design using Web-based course materials and maintenance of on-line Web courses.

- Equity issues of computer technology should be addressed by every school in the form of hardware and software allocation to faculty areas.

- A well structured professional development program in computer technology and Internet training is highly recommended to schools.
Bibliography

Reference Lists


(http://www.ascilite.org.au/conferences/adelaide96/papers/06.html).


Australia: Maximedia.


Pinion, F. (1964). Educational Values in an Age of Technology. London:


List of Appendices

Appendix A: Questionnaire 1, Part 1
Appendix B: Questionnaire 1, Part 2
Appendix C: Questionnaire 2
Appendix D: Personal Interview Questions
Appendix E: Technology Plan
Appendix F: Internet Policy
Appendix G: Letter to the Principal
Appendix H: Letter of Approval to Conduct Research by Principal
Appendix I: Letter of Consent
Appendix J: Letter of Approval from the Ethics Committee
   Conduct Research
Appendix K: Internet Training of Teachers Module
Appendix L: School/Government Policies/Bulletins/Memoranda
APPENDIX A

Elizabeth Macarthur High School
Waterworth Drive, Narellan, N.S.W.

QUESTIONNAIRE NO. 1, Part 1

Internet Training 1998 - Course Evaluation
Term 1, Weeks 4, 5 & 6

The questionnaire is divided into two parts. Could you please answer Part 1 after the training and Part 2 after implementing the use of Internet your Key Learning Area?

1. Could you please answer the following?
   a.) Key Learning Area ________________________________
   b.) Number of teaching experience ______________________
   c.) Previous computer technology training. Put a tick on the space provided.
      - None
      - Minimal
      - Average
      - Degree in computing
      - Others, specify ________________________
   d.) Previous Internet Training. Put a tick on the space provided
      - None
      - Minimal
      - Average
2. Having successfully completed the Internet Training at Elizabeth Macarthur High School, how will you integrate the use of Internet in the classroom? Rank the items listed below from 1 to 5.

1 = highest score, 5 = lowest score

☐ Prepare lesson plan incorporating Web sites as source of information

☐ Set clearly defined goals using Internet to achieve student outcomes

☐ Monitor students while searching on the Net

☐ Locate Web sites useful in my subject area for student’s use

☐ Assess student’s work using the Internet

3. As a teacher, what are your views in using Internet in the classroom? Rank the items below from 1 to 5.

1 = highest score, 5 = lowest score

☐ Develop research and inquiry skills of students

☐ Develop communication and writing skills of students

☐ Collaborative learning could take place between students and teachers

☐ Classroom management problem because of computer-student ratio

☐ Need Internet/technology support in hardware and software
4. In your view which of the following Internet functions are likely to be implemented in your classroom. Rank them in priority order from 1-5.

1= highest score, 5= lowest score

- Develop research and inquiry skills of students
- Develop communication and writing skills of students
- Collaborative learning could take place between students and teachers
- Developing student-centered learning
- Developing logical reasoning of students

5. In your view which of the following classroom management strategies are you likely to implement in using the Internet in the classroom. Rank them in priority order from 1 - 5.

1= highest score, 5= lowest score

- Teacher-directed learning
- Student collaboration and peer tutoring
- Collaboration between teachers and students
- Use of student expert(s) to assist teachers in the classroom
- Traditional way of teaching, i.e. question and answer method

6. Do you think technical support (hardware and software) is important when using Internet in the classroom? If yes, rank the following according to your needs from 1-5.

1= highest score, 5= lowest score

- Technical person should always be available in the school
- Internet co-ordinator is available when teachers need help
- Expert in networking should be available in the school
If technical person is not available at school, the school should employ fulltime support

Easy access to school timetable and communication facilities to call for help

7. In your view, which of the following school support are likely to be needed when using the Internet in the classroom. Rank in priority order from 1-5.

1= highest score, 5= lowest score

- Curriculum support
- Support from fellow teachers
- Computer teacher's support
- Whole school support
- Executive leader's support

8. In your view, do you think you need support in writing lesson plans to integrate the use of Internet in the classroom? If yes, rank the following in priority order from 1-6.

1= highest score, 6 = lowest score

- School should get an expert to assist in lesson plan writing using the Internet
- Use teachers with expertise in the Internet use to write lesson plans
- Should be a faculty responsibility
- Head teachers should assist in lesson preparation incorporating the use of Internet
- Lesson plan writing using the Internet should be done by faculty basis on staff development time
- Should be individual teacher responsibility
The study questionnaire is divided into two parts. You have already completed Part I for me. Could you please now answer Part 2 after implementing the use of Internet in your Key Learning Area.

1.) As a summary, do you believe use of the Internet provided enhanced teaching and learning in your Key Learning Area. YES__NO__

Rank the following statements in order in terms of outcomes in your Key Learning Area through the use of Internet.

1= highest score, 5= lowest score

☐ Student taking responsibility for their own learning
☐ Teacher as a learner/facilitator/mentor
☐ Student became more involved in learning
☐ Teacher directed learning replaced by student-centred learning
☐ Students produced good projects and assignments using Internet as against traditional use of books

Can you give specific examples?
2.) Use of the Internet broadened the scope of sources of information in your subject area for students? YES__NO__. 
Rank the following statements in order of importance for enhancing teaching and learning in your Key Learning Area through use of the Internet.

1= highest score, 3= lowest score

☐ Essay writing improved using Internet 
☐ Enhanced research projects using Internet 
☐ Students incorporated graphics in their project presentation

3.) Do you think the research/inquiry skills of your students improved using Internet? YES__ NO__. Rank the following statements in order in terms of outcomes in your Key Learning Area when using Internet.

1= highest score, 4 = lowest score

☐ Database management skills of students developed 
☐ Exploration methods of students improved 
☐ Handling of information developed 
☐ Evidence of variety of research

4. Do you feel that you could make more use of the Internet in your Key Learning Area? If yes, could you support your answer.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
5. If your answer is NO in Question 4, what do you feel is stopping you from making more use of the Internet. The following are some of the reasons teachers commonly state. Could you please make a comment in a few words.

- access to computers, lack of technology training,
- time table, lack of technology support, not enough computers
Elizabeth Macarthur High School
Waterworth Drive, Narellan, N.S.W.

QUESTIONNAIRE NO. 2

Could you please answer THE FOLLOWING QUESTIONS. Your participation, support and cooperation in this study is greatly appreciated. Hopefully this study will shed light on enhanced teaching and learning using Information Technology as a tool.

1. In the Implementation of the Internet Policy at Elizabeth Macarthur High School, what do you think were the key influences in its successful implementation? Rank the following from 1 to 10.

1 = greatest influence 10 = greatest hindrance

☐ In-service training
☐ Access to computer
☐ Technology support
☐ Whole school support
☐ Teaching strategies
☐ Monitoring of students using the Internet
☐ Networking facilities
☐ Classroom management
☐ School executive implementation process
☐ Student assessment
2. Do you believe the school executive has successfully implemented the Internet Policy at Elizabeth Macarthur High School? YES___ NO___ Please indicate your own view by encircling one of the letter choices next to each of the following statements.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

a.) The whole school (students, teachers, administrative staff, parents) is aware of the Internet Policy being implemented at Elizabeth Macarthur High School.

   SA  A  U  D  SD

b.) The Internet Policy at Elizabeth Macarthur High School is clearly defined for student access.

   SA  A  U  D  SD

c.) The Technology Committee worked collaboratively on issues relating to the Technology Plan implementation at Elizabeth Macarthur High School.

   SA  A  U  D  SD

d.) School executive has strong leadership role (management, educative and transformational) in the implementation of technology at Elizabeth Macarthur High School.

   SA  A  U  D  SD

e.) The school has been equitable in meeting the hardware and software needs of teachers and students.
3. A Professional Development Program of teachers in Computer Technology and Internet Training has been implemented at Elizabeth Macarthur High School. Please indicate your own view about the following statement by encircling one of the letter choices next to each of the following statements.

SA = strongly agree
A = agree
U = undecided
D = disagree
SD = strongly disagree

a.) All if not most teachers need computer technology training as clearly stated in one of the key strategies of the Government's Computer Policy in Schools.

SA A U D SD

b.) School clearly identified the need of Internet Training for teachers.

SA A U D SD

c.) Teachers need ongoing support for computer technology training.

SA A U D SD

d.) Teachers should be provided with computers for loan to take home to further support computer technology training.

SA A U D SD

e.) Teachers with expertise in computer technology should be recognised by the school and be asked to volunteer to support training.
f.) The Computer Co-ordinator should have a major role in computer-based training for the school.

 SA  A  U  D  SD

g.) School should have a clearly defined Professional Development Training Plan in Computer Technology.

 SA  A  U  D  SD

h.) School should provide Computer- Based Technology training specifically geared towards the use of computers in all Key Learning Areas.

 SA  A  U  D  SD

i.) The school should evaluate Technology Implementation in the form of action research.

 SA  A  U  D  SD

j.) The school should have a software and hardware compatibility policy.

 SA  A  U  D  SD

4. Please indicate if you have some concerns, recommendations and problems in the implementation of Internet Policy at Elizabeth Macarthur High School, i.e., access to
computers, classroom management, technology support, time to undergo training, compatibility of software and hardware. Please specify. Note: This is a confidential study. The identity of each participant will not be disclosed. The survey was reviewed by the Ethics Committee of Wollongong University.

Thank you for your participation and co-operation in this research.

Rebecca Hudson
Graduate School of Education
Wollongong University

tel/fax no. (02) 42619503
e-mail: rebeccah@bigpond.com
APPENDIX D

Interview Questions

Can you please participate in this interview. Your views and answers will be valuable in this study.

1.) From the result of the survey, in-service training ranked number one as the key influence in the Implementation of Internet Policy at Elizabeth Macarthur High School. How would you like in-service training to occur at Elizabeth Macarthur High School? Can you please choose your answers in any of the following and give your reasons for it?

a.) after school hours
b.) during professional development day
c.) during school hours with relief periods
if so,
1.) do you prefer long term training until teachers are confident to use the Internet?
OR
2.) do you prefer short term training because of time factor?

2.) The Internet Policy has not been successfully implemented at Elizabeth Macarthur High School as a result of the survey, what do you think are some strategies to successfully implement such policy?

a.) through the leadership of Head Teachers
b.) whole school support, e.g., teachers get more involved in the implementation process
c.) or both
d.) others, specify________

3.) The whole school (students, teachers, administrative staff, parents) is not aware of the Internet Policy being implemented at Elizabeth Macarthur High School as indicated by the survey.

a.) Do you think the principal should clearly give responsibility to the Head Teachers to assist in the implementation of the Internet Policy?

b.) Do you think that the P&C should assist in passing information to parents of students in the school?
c.) Do you think teachers and students pay attention to important policies such as the Internet Policy and not just put it aside because the Principal has clearly announced in school staff meetings, hand out document policy of the Internet at the school and also published it in the school newsletter.

You can choose your answers to any of the above or combination of them. Support your answer if you think it is necessary.

4.) What do you want to see happen so that the school executive will have strong leadership in the implementation of technology.

a.) The principal, deputy principal, leading teacher and head teachers should have an active role in the implementation of technology.

b.) Teachers, head teachers and the principal should work as a team to achieve a common goal for technology implementation.

c.) The principal should make the teachers aware of the need of computer technology in teaching and learning, i.e., computer technology is no longer a choice but it is a tool and a must in everyday existence hence in teaching and learning.

d.) All of the above

5.) The result of the survey is undecided if the school has been equitable in meeting the hardware and software needs of teachers and students.

a.) Do you think that all teachers should be provided with a list of inventory of software and hardware?

b.) Not all teachers at Elizabeth Macarthur High School are computer technology literate, do you think there should be a staff meeting to explain and in-service the teachers about hardware and software needs, equity, etc.?

c.) or both
6.) Teachers need ongoing support in computer training as strongly suggested by the survey. Do you think computer training should be done in a regular basis? If so, by whom?

7.) Teachers should be provided by computers for loan to take home for further support of computer technology training. Do you think this is happening at Elizabeth Macarthur School? If so, please support your answer.

If not, what is stopping the school from doing it.
- a.) no computers available for loan
- b.) the school has not look into computers for loan

8.) Survey shows that the Computer Co-ordinator should have a major role in computer-based training for the school.

- a.) Do you think this is happening in the school? Please support your answer.
- b.) If so, does the Computer Co-ordinator has a Technology Plan in placed technology training of teachers?

9.) The school has a clearly defined Professional Development Training Plan in Computer technology as revealed by the survey, what do you think is stopping the teachers from undergoing such training? Please specify.

10.) The survey showed that the school should provide Computer-Based Technology Training specifically geared towards the use of computers in all Key Learning Areas. Do you think it is the responsibility of the Head Teachers to arrange for training with the assistance of computer technology experts in the school? Please support your answer.
## Component: COMPUTER NETWORK

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative</strong></td>
<td><strong>Action/Initiative</strong></td>
</tr>
<tr>
<td><em>Request for quote for cabling for additional Library computers</em></td>
<td><em>Library network expanded and operating</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
</tbody>
</table>

Elizabeth Macarthur High School

Technology Plan

Implementation 1998
## Component: COMPUTER NETWORK

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative</strong></td>
<td><strong>Action/Initiative</strong></td>
</tr>
</tbody>
</table>
| * Request for quote for staffroom networking  
* Establishment of Staffroom network | * Establishment of Staffroom network | | |
| **Responsible:** | **Responsible:** | **Responsible:** | **Responsible:** |
| | | | |
| **Financial/other requirements:** | **Financial/other requirements:** | **Financial/other requirements:** | **Financial/other requirements:** |
# Elizabeth Macarthur High School

Technology Plan

## Implementation 1998

**Component:** STAFF TECHNOLOGY SKILLS

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong>&lt;br&gt;*Awareness raising of Technology Program for Head Teachers&lt;br&gt;*Staff workshop through Faculty Meetings&lt;br&gt;*Fortnightly after school workshops</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;*Fortnightly after school workshops</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;*Staff workshop through Faculty Meetings&lt;br&gt;*Fortnightly after school workshops</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;*Fortnightly after school workshops</td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
</tbody>
</table>
## Component: STAFF TECHNOLOGY SKILLS

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
</tr>
<tr>
<td><em>Staff workshop through faculty meeting</em></td>
<td><em>After school workshops for new staff</em></td>
<td><em>Staff workshop through faculty meeting</em></td>
<td><em>After school workshops for new staff</em></td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
</tbody>
</table>
## Elizabeth Macarthur High School

### Technology Plan

#### Implementation 1998

**Component:** ADMINISTRATION

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative</strong></td>
<td><strong>Action/Initiative</strong></td>
</tr>
<tr>
<td>Years 7 and electronic reporting in place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
</tbody>
</table>
Elizabeth Macarthur High School

Technology Plan

Implementation 1999

Component: **ADMINISTRATION**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
<td><strong>Action/Initiative:</strong></td>
</tr>
<tr>
<td><em>Report system placed on staffroom network</em></td>
<td><em>Security issues addressed</em></td>
<td><em>Faculty E-mail system established</em></td>
<td></td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
<tr>
<td>Term 1</td>
<td>Term 2</td>
<td>Term 3</td>
<td>Term 4</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Action/Initiative:</strong>&lt;br&gt;- Planning meetings for:&lt;br&gt;  - Rollout distribution&lt;br&gt;  - Library Network&lt;br&gt;  - Staff workshops for faculty and after school meetings&lt;br&gt;- Initial evaluation of workshops&lt;br&gt;- Technology support role established</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;- Planning meeting for training for networks</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;- Planning meeting for preparation of Technology budget submission</td>
<td><strong>Action/Initiative:</strong>&lt;br&gt;- Meetings for evaluations of:&lt;br&gt;  - Workshops&lt;br&gt;  - Technology Plan&lt;br&gt;- Technology Support from DSE??!!</td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
<td><strong>Responsible:</strong></td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
<td><strong>Financial/other requirements:</strong></td>
</tr>
</tbody>
</table>
## Elizabeth Macarthur High School

**Technology Plan**

**Implementation 1999**

Component: **TECHNOLOGY MANAGEMENT**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Initiative:</strong>&lt;br&gt; <em>Establishment of Staffroom Network needs</em>&lt;br&gt; <em>Training for use of staffroom network</em></td>
<td>Action/Initiative</td>
<td>Action/Initiative</td>
<td>Action/Initiative</td>
</tr>
<tr>
<td><strong>Responsible:</strong></td>
<td>Responsible:</td>
<td>Responsible:</td>
<td>Responsible:</td>
</tr>
<tr>
<td><strong>Financial/other requirements:</strong></td>
<td>Financial/other requirements:</td>
<td>Financial/other requirements:</td>
<td>Financial/other requirements:</td>
</tr>
</tbody>
</table>
INTERNET CODE OF BEHAVIOUR AGREEMENT

1. At school, I will abide by the rules for utilising the Internet, as specified in the School’s Access to the Internet Policy. I will not access sites with socially unacceptable material.

2. I will not give out personal information such as my address, telephone number, parents’ work address and telephone number, or the location of my school without permission.

3. I will inform my supervising teacher immediately if I come across any information that is unacceptable for school.

4. I will not send anyone my picture or personal details without my parents’ approval.

5. I will not download socially unacceptable material.

6. I will comply with the copyright laws relating to downloaded material.

Yes, it is appropriate for our child to access the Internet.

No, it is not appropriate for our child to access the Internet.

Student Name: (Block letters)……………………………………… Class/Year………………

Student signature………………………………………………… Date………………

Parents/Guardian’s Name: (Blockletters)………………………….

Parent/Guardian’s signature………………………………………… Date………………

Please return the signed agreement to the Office.
Access to the Internet Policy

1. No student will operate a school computer with internet access unless he/she has signed the Internet code of Behaviour and has been issued with the appropriate card.

2. Individual students will not access or generate their own e-mail accounts while using the school’s computers unless authorised and supervised by a teacher.

3. Students will not access any chat line unless directly supervised by a teacher.

4. No inappropriate material is to be accessed.

5. No information should be saved to the C-Drive.

6. Floppy disks will only be used on the system with a teacher’s permission.

7. Students will not create their own web page or edit an existing one.

8. The school’s computers are for research purposes only. Students at computers must be able to produce appropriate evidence of their research task.

9. Breaches of the above policy or the code of Behaviour will result in loss of access to the school’s computers.
Appendix G

University of Wollongong
Graduate School of Education

26 February 1998

Mr. Richard Leemen
Principal
Elizabeth Macarthur High School
Waterworth Drive, Narellan 2567

Dear Mr. Leemen

May I request permission from you to conduct a study at Elizabeth Macarthur High School as a part of my research degree in Information Technology at Wollongong University. The title of my study is “Implementation of Government’s Computers in Schools Policy: a Case Study”. The research issue is how can a school effectively implement Internet Policy to enhance teaching and learning. The key issues to be investigated are:

- What are the implementation strategies that exist in Elizabeth Macarthur High School for gaining acceptance of the Internet Policy?
- How does teacher training in using the Internet enhance learning and teaching at Elizabeth Macarthur High school?
- How does the school executive implementation process (support) impact on the successful implementation of the Internet Policy at Elizabeth Macarthur High School?

I deeply appreciate your co-operation and support. Without you and the co-operation of your teachers and students, I would not be able to conduct this research study, which hopefully will shed light on and enhance teaching and learning using information technology as a tool. When this study is completed I will provide you with a description of the results.

Sincerely yours

Rebecca Hudson
21st May, 1998
RL:HH

TO WHOM IT MAY CONCERN

I write to acknowledge that a member of the teaching staff of this school, Rebecca Hudson, has my permission to conduct research within it. Her research area has been nominated as "The Implementation of Government Policy in Computers in Schools: Internet Policy at Elizabeth Macarthur High School."

Yours sincerely,

Richard Leemen
Principal.
Appendix I- Consent Form

UNIVERSITY OF WOLLONGONG

INFORMATION SHEET

IMPLEMENTATION OF GOVERNMENT'S COMPUTERS in
SCHOOLS POLICY: a CASE STUDY.

REBECCA HUDSON

This research project is being conducted as part of a Master of Education with
honours major in Information Technology supervised by Dr. Barry Harper in the
department of Graduate School of Education at the University of Wollongong.

The research issue being investigated is how can a school effectively implement Internet
Policy. The key questions to be investigated are:

- What are the implementation strategies that exist in Elizabeth Macarthur High School
  for gaining acceptance in the introduction of the Internet Policy?

- How does teacher training in the Internet enhance learning and teaching at Elizabeth
  Macarthur High School?

- How does the school executive implementation process (support) impact on the
  successful implementation of the Internet Policy at Elizabeth Macarthur High School?

It is assumed that the results of the findings will impact on the learning
outcomes of students, strategic planning of computer technology policy,
educational leaders, educational planners and governments.

Your participation in this research is voluntary, you are free to refuse to participate
and you are free to withdraw from the research at any time.

If you would like to discuss this research further please contact Rebecca Hudson
(Researcher's name) on (02) 42614703 (Phone/Fax number), e-mail: rebeccah@bigpond.com or Dr. Barry Harper (Supervisor's name) on (02) 42213465
(Phone number), e-mail: Barry_Harper@uow.edu.au. If you have any enquiries
regarding the conduct of the research please contact the Secretary of the University
of Wollongong Human Research Ethics Committee on (02) 42214457.
CONSENT FORM

Research Title: IMPLEMENTATION OF GOVERNMENT'S COMPUTERS in SCHOOLS POLICY: a CASE STUDY

I, ................................................................. (Participant’s name) consent to participate in the research conducted by Rebecca Hudson (Researcher’s name) as it has been described to me in the information sheet. I understand that the data collected will be used to determine the effective implementation of Internet Policy in a school and I consent for the data to be used in that manner.

Signed                                       Date

.................................................................           ........../......./.....
23 June 1998

Ms R. Hudson
1 Marie Place
Horsley Park Estate
West Dapto NSW 2530

Dear Ms Hudson,

Thank you for your response to the Ethics Committee's requirements for your Human Research Ethics application HE98/164 "The implementation of government's policy on computers in schools: Internet Policy at Elizabeth Macarthur High School".

Your response and amendments meet with the requirements of the Committee and your application is now formally approved.

Yours Sincerely,

Karen McRae
Secretary to the
Human Research Ethics Committee
Ms Rebecca Hudson
1 Marie Place
Horsley Park Estate
West Dapto NSW 2530

Dear Ms Hudson,

I am pleased to advise that the following Human Research Ethics application has been conditionally approved.

Ethics Number: HE98/164
Project Title: The Implementation of Government’s Policy on Computers in Schools: Internet Policy at Elizabeth Macarthur High School
Name of Researchers: Rebecca Hudson
Clearance Date: 12 June 1998
Duration of Clearance: 11 June 1999

This approval is granted subject to the following conditions:

(i) retitling the page that has the information about the project, Information Sheet and the page that participants sign, the Consent Form. There is a page missing of a letter to participants (between the information and consent).

Please provide written clarification of the conditions to the Secretary of the Committee before commencing your research, or approval will be withdrawn.

This certificate relates to the research protocol submitted in your original application of 21 May 1998. It will be necessary to inform the Committee of any changes to the research protocol and seek clearance in such an event.

Please note that experiments of long duration must be reviewed annually by the Committee and it will be necessary for you to apply for renewal of this application if experimentation is to continue beyond one year.

Dr S. Dodds
Chairperson
Human Research Ethics Committee

cc. Dr Barry Harper, Supervisor
24 June 1999

Ms R. Hudson
1 Marie Place
Horsley Park Estate
West Dapto NSW 2530

Dear Ms Hudson

I am pleased to advise that renewal of the following Human Research Ethics application has been approved:

Ethics Number: HE98/164
Project Title: The implementation of government’s policy on computers in schools: Internet Policy at Elizabeth Macarthur High School
Name of Researchers: Rebecca Hudson
Approval Date: 22 June 1999
Duration of Approval: 21 June 2000

This certificate relates to the research protocol submitted in your original application and the renewal application of 15 June 1999. It will be necessary to inform the Committee of any changes to the research protocol and seek clearance in such an event.

Please note that experiments of long duration must be reviewed annually by the Committee and it will be necessary for you to apply for renewal of this application if experimentation is to continue beyond one year.

Dr S. Dodds
Chairperson
Human Research Ethics Committee

cc. Head, Faculty of Education
Internet Training

By

Rebecca Hudson
Internet Co-ordinator/Computing Teacher
Elizabeth Macarthur High School

♦ Objective: Use of the Internet could provide enhanced teaching and learning opportunities for teachers and students across Key Learning Areas. One of the key strategies of the Government Computers in Schools Policy, 1996-1999 is teacher training and professional development using the Internet. This training is provided by Elizabeth Macarthur High School part of the computers policy, New South Wales Department of Education and Training.

♦ Duration: 6 hours

♦ Participants: Teachers, Librarians, Principals/School Executives who don’t have training using the Internet and those who have minimal training as well.

♦ Requirement: If you choose this session at the beginning, you are required to complete the 6 hours training as this is a session with “Certificate of Achievement”

Expected Outcome: At the end of 6 hours training the teachers should be able to:

• know the different terminologies used in Internet i.e., URL, domain, http, hyperlinks, etc.
• locate sites comfortably by using search engines such as ALTA VISTA, WEBCRAWLER, YAHOO, INFOSEEK
• refine searches by using Boolean Search such as the use of +, -, " "
• save document from the Net to either hard drive or floppy disk
• print document from the Net
• produce at least 3 projects using the net that can be useful for research and classroom teaching
• cite web sources in a research paper
• comfortably use Internet as a tool for teaching
• prepare lesson plans in their respective KLA
Lessons

Lesson 1: Terminologies/Definitions
Lesson 2: Using Netscape/Searching the Web
Lesson 3: Saving documents from the web to hard drive/floppy disk
Lesson 4: Printing document from the web
Lesson 5: Selecting a search engine and refining the web by Boolean Search. +.- and “___”
Lesson 6: Typing web sites
Lesson 7: Locating sites In the net, example http://www.____.com.au
Lesson 8: Test/Projects using the web
Lesson 9: Research using the web, citing websites
Lesson 10: E-mails, how to compose and send them

Follow up / evaluation/feedback
Technical Aspect

Stage 1
• turn on the computer
• wait until numbers 1 & 2 appear on the screen
• quickly press 1 and hit return key
• now, icons will appear on the screen, select Netscape Gold and double click it
• wonderful, you are now on Netscape

Stage 2
Browsing the Web

• once you are on Netscape, click Netsearch
• then find Yahoo, click it
• scroll at the bottom of the page, you will see the heading “search engines”
• there are quite a few search engines, but this time we will use ALTA VISTA, click it
• once the screen is up, there is a space to type in the word or phrase you want to find
• now we will focus on locating “lesson plan”.
• type lesson plan on the space, then press search on the right hand corner
Terminologies/definition

**Internet** - network of networks

**URL** - Uniform Resource Locator

  ex. http://www.yahoo.com

**Web Browser** - software that displays graphics and text

**http** - protocol which is used to transfer data or text

  hypertext transfer protocol

**Websites** - divided into web pages in one page designated as home page

**hyperlinks** - homepage containing links to other web sites called links

**bookmarks** - stores in a full name and address of selected site so that it can be accessed in a later time

**E-mail** - electronic mail

Example:

  info@OREGON.UOREGON.EDU

  Username: info@
  Host: OREGON
  sub domain: UOREGON
  domain: EDU
MATCH THE FOLLOWING WORDS
by using an arrow

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>bmarshal</td>
<td>domain</td>
</tr>
<tr>
<td>edu</td>
<td>Web site</td>
</tr>
<tr>
<td>http</td>
<td>e-mail address</td>
</tr>
<tr>
<td>URL</td>
<td>www</td>
</tr>
<tr>
<td>hyperlinks</td>
<td>hypertext protocol</td>
</tr>
<tr>
<td>world wide web</td>
<td>browser</td>
</tr>
<tr>
<td>yahoo</td>
<td>uniform resource locator</td>
</tr>
<tr>
<td>+,-,&quot; web&quot;</td>
<td>contains links to other pages</td>
</tr>
<tr>
<td><a href="mailto:gknowles@nsw.edu.au">gknowles@nsw.edu.au</a></td>
<td>username</td>
</tr>
<tr>
<td><a href="http://www.rocketmail.com">http://www.rocketmail.com</a></td>
<td>Boolean Search</td>
</tr>
<tr>
<td>Netscape Navigator</td>
<td>search engine</td>
</tr>
</tbody>
</table>
Lists of Projects

You can select at least 2 from the projects listed below:

• Select one of the scientific topics below and then find a minimum of five Web sites that provide information in your topic. Using the information you find, write a brief report. Be sure to cite sources.
  - hurricanes
  - tornadoes
  - the hubble telescope
  - the ozone layer
  - earthquakes
  - solar energy

• You and your friend/family decided to take a trip to Singapore. Using the Web find out as much as you can including airfare, hotels, climate, required documents and restaurants. Also search Singapore cultural centres such as museums, orchestras and theatres. List the URLs for a minimum of six cites on this topic. Write a brief report with the information you found and cite each source.

• Each of the following people made a major contribution to the world of Art or Music. Write a brief biography of one of them based on research performed on the Web. Select a minimum of five sites to produce your research. List the URLs for the Web cites and cite each source.
  - Mary Cassat
  - Ludwig von Beethoven
  - Michelangelo Buonarroti
  - Wolfgang Amadeus Mozart
  - Joan Sutherland
  - Pablo Picasso
Advanced Project

Select a topic that you are interested in. Use at least two search engines to produce a listing of Web sites that contain information about your chosen topic.

- What search engine did you use?

- What was your search criteria?

- How many matches were made by the search engine?

From the matches made by the search engines, visit at least ten sites and then select the four best. For each selected site give description of the site’s contents and then site the source. You may wish to include a printout of the site’s homepage or any other relevant Web pages.

In a short essay (300 - 400 words) write a summation of your findings and any conclusions you are able to make.
Refining Web Searches using Boolean Search

Limiting the number of matches to a reasonable number can usually be accomplished by refining the words used to form the search criteria. For example if we enter Hawaii as the criteria into Infoseek, we get more than 147,000 matches, but the criteria Hawaii + Travel lowers the number to 52,000 matches. The criteria Hawaii + Museum results in only 45,000 matches.

+ ( plus sign )...... The + ( plus sign ) used in the search criteria tells the search engine to limit a search to only those websites containing two or more specified words.

Note: there should not be a space between the plus sign and the next word.

Example: New South Wales+hotel+motel

- ( minus sign )...... The - ( minus sign ) is used to exclude unwanted sites.

Example: The search for Shakespeare - play returns hyperlinks to sites containing the word Shakespeare, but eliminates sites that also contain the word play.

a space..... Separating words with just a space broadens a search to find sites that contain any of the words in the criteria.

Example: Using spaces is also useful in searches for different spellings of a word, for example, colour colour.

The +, -, and space can be combined to produce very precise criteria.

For example:

horse+buggy-carriage

Tuna salmon-salad

Recipe chicken-soup

University+Australia-New South Wales
Evaluating Sources

In researching a project on the Internet it is important to evaluate the source of the information you will use. Anyone can post information on the Internet. There are no rules as to accuracy and reliability of the information. This means that you must discriminate, read carefully, and check your sources.

Here are a few questions you should answer when considering the reliability of the source.

- On what date was the publication posted? Is the information up to date?
- Is the information factual or the opinion of the author?
- What is the primary source of the information? You are most likely to trust information posted by NASA or the University of New South Wales than information posted by a high school student who cites no sources.
- Does the author present his or her credentials? You are most likely to thrust a well established authority in the field you are researching.

Citing Web Sources in a Research

When citing Web sources, it is important to remember that the primary purpose of a citation is to allow the reader to locate the cited information. As of yet the academic world has not agreed to a single citation standard, but one of the most widely accepted forms is that published by the Modern Language Association (MLA) in its publication MLA Handbook for Writers of Research Papers, Fourth Edition. Several web sites also have examples of citations for material found on the Internet. Most of these other sites are similar to the MLA guidelines, with the addition of URL where the information was found. According to the MLA guidelines plus the URL, the general form of the citation is:

Author’s Last Name, First Name MI. “Title of the Document.” Title of the Journal, Newsletter, or something similar Volume number (year of publication): Number of pages or paragraphs. Online. Internet. Available http: URL

For example:


Note: No periods are used after the URL to avoid confusion with the periods included in the URL, and the parentheses around the date are included to better separate it from the URL. Make sure to; list the URL exactly as it appeared when the cited document was located so that the reader can locate the source.
Internet Training: Course Evaluation

Could you please answer the following questions?

1. The objectives of the course were clearly identified. Put a tick on the space provided. 
   
   YES...
   
   NO.

2. The trainer’s delivery of the course was clear and concise. Put a tick on the space provided.
   
   YES...
   
   NO.

3. The trainer was patient and paced the course appropriately. Put a tick on the space provided.
   
   YES...
   
   NO.

4. Is the course an exciting experienced for you? Support your answer.

   ..................................................................................
   ..................................................................................
   ..................................................................................
   ..................................................................................
   ..................................................................................

5. Do you recommend the training to teachers/school staff of the use of Internet in their teaching? Support your answer?

   ..................................................................................
   ..................................................................................
   ..................................................................................
   ..................................................................................
   ..................................................................................

Thank you for your participation in this training...R. Hudson
Appendix L

- NSW Government’s Computers in Schools Policy.

STUDENT ACCESS TO THE INTERNET

The New South Wales Government's Computers in Schools strategy includes the connection of schools to the Internet through the Department of School Education's (DSE) Internet service.

Use of the Internet in schools should be focussed on improving student learning outcomes in purposeful curriculum-specific contexts. The provision of Internet access to schools provides an opportunity for school communities to discuss and clarify the educational issues associated with the use of the Internet and to develop strategies to support teaching and learning initiatives that utilise the Internet.

Internet use provides opportunities to enhance student learning experiences through access to the vast amount of information available on the Internet. Connecting schools to the Internet also greatly enhances the ability of teachers and students to communicate electronically with other Internet users.

While much of the information available on the Internet is suitable for use in schools, some material is inappropriate for use by students. Schools therefore have a responsibility to ensure that students use the Departmental Internet service safely, effectively and responsibly.

Responsibilities of schools

Each school is responsible for the information that students both send and receive while using the Internet connection.

Each school is required to develop, in association with its community, a Student Access to the Internet Policy for the safe management and effective use of the school's Internet connection, by the end of term four 1997.

Each school's Student Access to the Internet Policy will address the following:

- the safety and privacy of students, staff and other Internet users;
- establishment of an Internet code of behaviour for use by students which clearly identifies the consequences of breaches of the code of behaviour;
- strategies for dealing with the transmission or receipt of inappropriate Internet material;
- equity of access to the Internet computer system;
- the relationship with established principles of and existing school policies and strategies regarding student welfare, good discipline and effective learning, child protection, anti-racism and anti-discrimination;
- strategies for the effective and secure management of the school's Internet computer system and associated virus and user access software;
- the legal requirements regarding copyright for students and staff, including the copyright of computer software;
- provision for regular review and revision of the policy.
MEMORANDUM TO PRINCIPALS

SCHOOL PUBLISHING ON THE INTERNET

Schools have been provided with the ability to publish on the Internet as part of the Government's Computers in Schools strategy and the Department's Internet project. While this ability affords considerable educational opportunity, the unregulated nature of the Internet requires that schools take care to maintain a safe and secure learning environment for all members of the school community. The requirements contained in this memorandum apply to all schools and all materials published by schools on the Internet using either the Department's or any other Internet service.

This memorandum should be considered in conjunction with:

- the document, Connecting All NSW Government Schools to the Internet (1996);
- the memorandum to principals (97/011), Student Access to the Internet and the associated support materials, Student access: developing a school Internet policy.

School Publishing

All schools have been provided with space on the Department's Internet service to publish school information in World Wide Web format. The Internet computer system in schools contains software to facilitate this publication process.

Each school's World Wide Web "home page", located on the Department's or any other Internet service, will include:

- acknowledgement that the school is a NSW government school;
- a link to the Department's World Wide Web site, Network for Education;
- school contact details, which might include the school's postal address, phone and fax numbers and e-mail address.

Principals should refer to the policy statement and guidelines document Sponsorship of School and Departmental Activities (1991) when considering opportunities for strengthening and building relationships with the local community provided by the Department's Internet service.

Principal's Responsibilities

The Principal has responsibility for all material published in the school's name on the Internet. Principals must:

- give written approval prior to the publication of all materials;
- ensure that all content is both appropriate for publication and of an acceptable quality;
- ensure that a process to regularly review and update all materials is developed and implemented;
- approve the inclusion of links to other Internet sites from the school's Web pages;
- ensure that all materials published in the school's Web pages have appropriate copyright clearance.
MEMORANDUM TO PRINCIPALS

GOVERNMENT’S COMPUTERS IN SCHOOLS PROGRAM:
PHASE TWO EQUIPMENT DISTRIBUTION

The Minister has announced the second phase of the Government’s Computers in Schools Program for the distribution of computer equipment to schools.

Schools will receive computers in term four 1997 and in terms one and two 1998.

- Enclosed is your school’s provisional computer entitlement for the second phase of the program. The provisional allocation for your school is based on enrolment data for 1997 and is expressed in units. The total allocation for your school will be adjusted, if required, when enrolment data for 1998 becomes available.

- New arrangements provide schools with the flexibility to choose from a range of computer equipment, including lap-tops, desktops and network file servers. Your school may select a mix of computer equipment within the school’s total allocation.

Schools may acquire the following computer equipment on the following basis.

- Each unit may be used to acquire one desktop computer.
- Two units may be used to acquire one laptop computer or one Apple fileserver.
- Two to five units may be used to acquire one Intel fileserver depending upon the specifications and the supplier.
- One unit may be used to acquire one Libretto 50 palm top and two units used to obtain one Libretto 70 palm top.
- One unit may be used to acquire two Apple e-Mate or two Acorn Pocket Book computers.

The attachments to this memorandum detail the procedures for ordering computer equipment under the second phase of the Computers in Schools Program, equipment specifications and suppliers.
If your school is entitled to receive additional computers in term one 1998 you will receive a memorandum containing an updated list of suppliers and any changes in the equipment specifications.

Some schools may have outstanding orders from the first phase of the Government's Computers in Schools Program. Please note that desktop computer entitlements from the first phase allocation are not able to be converted to the second phase entitlement model. Schools with outstanding first phase orders should use the list of suppliers and specifications for desktop computers included in the attachments.

Further information on these matters may be obtained from the Technology Directorate telephone 02 9561 8911 or from your District Office Technology Adviser.

Yours sincerely,

Phillip Arthur
Director of Technology and
Chief Information Officer

2 4 NOV 1997

Distribution: 1 2 3 6 7
The Principal  
All Government Schools

98/081 (S.074)

COMPUTER COORDINATOR ALLOCATION

The Government’s Computers in Schools Program includes provision for computer coordinator support in government schools.

The Minister has recently approved of an annual computer coordinator allocation being provided to all schools in the form of specifically identified funds according to the relative size of each school as measured by teacher numbers. This new allocation is additional to the computer education funding component already included in each school’s general operations grant.

Principals will be given maximum flexibility in determining how the computer coordinator allocation may be best applied to facilitate the use of computers for educational purposes.

The options, depending on the size of the school, include:

- employment of teachers as computer coordinators
- employment of computer technicians or computer maintenance personnel
- pooling allocations with other schools to employ a computer coordinator
- employment of casual teachers to release teaching staff to undertake computer coordinator duties
- expenditure on computer related functions such as networking and cabling
- entering into a contract with service providers to ensure that technology support is available to the school.

Principals may wish to seek advice from their district technology adviser on the most effective means of utilising their computer coordinator allocations.

Details of your computer coordinator allocation are attached. This allocation is your school’s entitlement for the 1997/98 financial year and will be paid direct to your school bank account shortly. Allocations will be increased for 1998/99 and again for the 1999/2000 financial year. Future payments will be made as half-yearly instalments with your global funding allocation commencing from semester two, 1998. The computer coordinator allocation is to be accounted for as a tied grant within the school’s chart of accounts.

Any enquiries concerning your school’s funding entitlement should be directed to the Department’s School and College Financial Support Unit by phone on 13 10 72.

Ken Dixon  
General Manager of Finance  
6 April 1998
NSW Government Computers in Schools Program

Phase 2

Information For Schools

February 1998

Contents

1. Ordering and Recording Procedures

2. Desktops
   2.1 Suppliers List - Desktop Computers
   2.2 Specifications
      2.2.1 Apple desktop
      2.2.2 Intel desktop
      2.2.3 Acorn desktop

3. Notebooks
   3.1 Suppliers List - Notebook Computers
   3.2 Specifications
      3.2.1 Apple notebook
      3.2.2 Apple eMate
      3.2.3 Intel notebook
      3.2.4 Acorn pocketbook

4. Fileservers
   4.1 Suppliers List Fileservers
   4.2 Specifications
      4.2.1 Apple fileserver
      4.2.2 Intel fileserver - specification D2
      4.2.3 Intel fileserver - specification D3
      4.2.4 Intel fileserver - specification D4

This package of information is applicable only to New South Wales government schools.
Government Computers in Schools Program

Ordering and Recording Procedures

Schools may now place orders for their provisional computer entitlements for Term 1 1998. Orders are to be made on the following basis.

- Each unit may be used to acquire one desktop computer.
- Two units may be used to acquire one notebook computer or one Apple fileserver.
- Three to four units may be used to acquire one Intel fileserver depending upon the specifications and the supplier. (Further information relating to fileservers is in sections 4.1 and 4.2).
- One unit may be used to acquire two Apple eMates or two Acorn Pocket Book computers.

Schools are requested to use the following procedures for ordering and recording the equipment.

RentWorks Ltd is the company that has been selected to supply the leasing facility for the Computers in Schools Program. The leased equipment remains the property of RentWorks Ltd during the term of the lease and is to be made available for collection in a "fair and reasonable condition" at the end of the three year leasing period. Details of the equipment should be recorded using the same procedures that the school used during Phase One. Computers in Schools Program equipment should not be engraved or permanently marked by the school.

The procedures for ordering and the delivery of equipment are essentially the same as used during Phase One.

Orders are to be placed with suppliers of the school's choice selected from the appropriate list. Schools should contact the suppliers to ascertain the address where the order may be sent. Each order must state that the computer equipment supplied is for the 'New South Wales Government's Computers in Schools program'.

The order should only be for computer equipment as described on the attached specification lists. Please note that for Intel computers schools should specify their preference for Windows 95 or Windows 3.11 software.

The installation of a network operating system on Intel fileservers may incur additional costs. Schools should contact their Technology Advisers for advice on the most cost effective way to install the operating software.

Computers will be delivered with a Certificate of Acceptance that must be completed. Schools should make a copy for their records and forward the original to the address specified on the certificate.

The computers should be entered as a nominal value asset in the school's asset register with a notation that they are leased computers from RentWorks.

Further information on these matters may be obtained from the Information Technology Bureau telephone 02 9561 8911 or from the District Office Technology Adviser.

This package of information is applicable only to New South Wales government schools.
CONNECTING ALL NSW GOVERNMENT SCHOOLS TO THE INTERNET

Rebecca Zone may be useful for your course participants.
INTRODUCTION

This document is the first in a series to be provided to schools supporting the Government's Computers in Schools Policy and the Internet project. It provides information regarding the implementation of the Internet project and some introductory information about the Internet.

The Government's Computers in Schools Policy aims to improve student learning outcomes through enhanced teacher and student access to and use of computers and related technologies. The major initiatives of the policy, being implemented over the four years from 1996 to 1999, are:

- connection of schools to the Internet
- provision of computer hardware
- additional staffing
- teacher training and development
- curriculum support

Information will be provided to schools concerning each of these initiatives prior to their implementation.

By the end of the 1996 school year, all Department of School Education (DSE) schools in NSW will be provided with a connection to the Internet, a computer system, modem and telephone line.

The Internet project aims to connect students, teachers and school community members to the global community and information resource called the Internet.

Use of the Internet will provide enhanced teaching and learning opportunities for teachers and students across all learning areas.

The project will provide schools with a comprehensive package of technology, training and development and support materials to facilitate the integration of the Internet into teaching and learning activities.
GOVERNMENT'S COMPUTERS IN SCHOOLS POLICY

The first issue related to the implementation of the Government's Computers in Schools Policy as approved by Government and funded by Treasury.

As discussed in the conferences held recently with the Teachers Federation on this matter, the Department is implementing a comprehensive strategy to give effect to the Government's Computers in Schools Policy. This policy builds and expands on the technology expertise and computer infrastructure that has been developing in recent years in schools.

Key aspects of the strategy are:

- connection of all schools to the Internet;
- the training and development of teachers in the use of computers within the key learning areas;
- providing additional personal computers to schools and additional technology support to teachers, students and schools; and
- developing curriculum support materials to enhance teaching and learning in all key learning areas.
Specific funding for the Government's Computers in Schools Policy has been allocated in the 1995/96 State Budget as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995/96</td>
<td>9.6</td>
</tr>
<tr>
<td>1996/97</td>
<td>26.1</td>
</tr>
<tr>
<td>1997/98</td>
<td>50.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$85.9m</td>
</tr>
</tbody>
</table>

This level of funding will provide for the following:

- the training of 15,000 teachers in the use of technology in the classroom;
- the appointment of 40 technology advisers to district offices;
- the development of curriculum materials to support teachers in integrating technology into their teaching practices;
- the provision of an initial allocation of 0.2 release time for computer coordinator support to High Schools and Central Schools as well as an additional Advanced Skills Teacher (AST) allowance for class 1 through class 4 Primary Schools and additional release time for class 5 and 6 primary schools;
- an additional 124 EFT positions in 1997/98 to increase the level of computer coordinator support in high schools leading to the provision of a full-time coordinator in each high and central school in 1998/99;
- the connection of all government schools to the Internet by the end of 1996; and
- the distribution of 51,030 personal computers to schools.

Internet

All schools will be connected to the Internet by December 1996 and will be provided with a personal computer with network capability, Internet software, a modem connection to the Department's Internet service provider and training in the use of the Internet.

Since September 1995, sixty six schools have been participating in an Internet Pilot. The pilot includes the trialing of hardware and software, access and security procedures, training and development of teachers and the development of curriculum support materials.
An evaluation of the pilot is currently being undertaken. The evaluation will facilitate the connection of all schools to the Internet by the end of December 1996.

Technology Advisers

Forty Technology Advisers will take up duty in District Offices from the commencement of Term 2 to provide technology advice and support to schools. Technology Advisers will:

- assist schools in developing technology plans to support school and state priorities;
- provide technology advice to schools on local area networks, personal computer hardware and software, communications and technology purchases;
- work in collaboration with curriculum advisers in advising teachers on how they can use technology to enhance their teaching programs;
- work with training and development staff in delivering technology training.

Teacher Training

A key element of the implementation strategy for the Government’s Computers in Schools Policy is the training of teachers.

The monetary equivalent of 250 positions over four years will be applied to teacher training. This will enable 15,000 teachers to be trained in the integration of technology in the classroom over three years.

A thirty-hour training course is being developed. The course comprises six components covering the following areas:

1. Internet
2. Teaching and Classroom Management Strategies
3. Computers and Related Technologies
4. Hardware to Enhance Teaching and Learning
5. Software to Enhance Teaching and Learning
6. Future Directions

Each component comprises an interactive satellite broadcast, a hands-on workshop and time for teachers to practice skills in their schools.
Curriculum Materials

The Department is developing curriculum materials to support teachers. Through the Internet pilot the Department has been trialing a range of materials including a practical guide on how to use the Internet to complement teaching programs, information on Internet sites which provide relevant references for teachers and students, and opportunities for teachers and students to communicate with other teachers and students about their educational experiences.

Support materials are being developed for each key learning area in secondary schools. A document for K-6 teachers is planned which includes information about the use of computers in all six primary key learning areas. The documents will support the 30 hour training program.

As discussed in meetings with the Federation the Department will consult with the Federation on the development of this material.

Computer Coordinators

The budget provides for an initial allocation of 0.2 EFT for computer coordinators in all high and central schools. This is in addition to the resource for computer coordinators already included in the global budget allocation to schools. This level of support will be increased in 1997/98 with additional funding equivalent to 124 EFT positions leading to the provision of a full-time coordinator in each high and central school in 1998/99.

An additional AST allowance will be provided for class 1 through to class 4 primary schools. Class 5 and 6 primary schools will receive additional relief days.

As discussed the Department will consult with the Federation on how best to provide this resource to schools.

Additional Computers

An additional 51,030 computers will be provided to schools, the bulk of these going to schools in the third year of the program. The distribution will be based on need in order to enhance the access of all students to computers.

The Government is currently negotiating arrangements for the leasing of computers for schools.

QUALITY ASSURANCE

The second issue concerned the Federation's request for clarification of the words "including the bans on quality assurance" in the first paragraph of the Department of School Education proposal of 15 March 1996 (Exhibit F).
How I changed it: To change this picture of a flower, I firstly erased the necklace and bracelet that were around the flower. I then blurred the flower by choosing blur from the downwards row in the tools palette. Then from the same place I choose the Smudge tool and smudged the flower. After that, I went up to Filter and then down to Stylize and across to Blurize. My flower went to how it is now so I left it.
To produce my new Happy Birthday card I used a colour it document. When I coloured it and pasted my picture there, I changed all the colours on the cake and the candles. To make the candles and the bottom of the cake lighter around the edges, I used the lightening tool.

I then changed the background colour to a rainbow pattern. The original scan is at the top of the page.

I used the pencil tool to write over the Happy Birthday.
By: Kelli Courtenay

My picture was taken off a die and the main design was the pegasus. I then designed a background and coloured the pegases to my desire. I used the line cutter, circle cutter and the letter writer.
1. I scanned a ten dollar into the computer.
2. I adjusted the size and resolution so it looked good and still fit on my disk.
3. I saved it to my disk and opened it in Kidpix.

P.T.O.
4. First I circled the windmill and turned it upside down.
5. Then I cut the one in ten out.
6. I then copied the zero and pushed another five next to the first.
7. I then used a thick pencil to draw a one.
8. I used the flood fill tool to fill in the gaps.
9. I used the text tool to do the writing at the top.
10. I used blue flood fill to get rid of the word ten in ten dollars.
11. In the bottom left hand corner.
12. I used the text tool to write "a lot of" in its place.
13. I used a thin pencil to write my signature down the bottom.
14. Because at the high resolution only one picture could fit on my disk, I saved one to the computer and printed them on at a time.
First I pre-scanned my picture. My image then appeared on the monitor. I then cut my desired picture to size, cutting off any rough edges. I was then able to fully scan my image. Once scanned I saved the picture on my disk. I was able to manipulate my original image by using some of the colour tools. I made a variety of 4 different manipulations to my work. First I solarized my image, then I darkened the tone of my solarized print. Then I blurred the image using a special effect. Finally I dramatically lightened my image, making colours seem brighter. All these manipulations were performed by special effects categorised in the toolbar. I then printed the five images - the original and four manipulations. I finally cut out the four manipulations and arranged them on an A4 piece of paper.

By LENA HUDSON
Line 1 Ms Hudson
Assignment Number 1: Social Implication of Computer Technology.

Answer each of the following questions. Total mark = 35

1. How have computers affected employment? (10 marks)

The unemployment has risen because of the introduction of computers and the many jobs that computers have replaced in semi-skilled jobs e.g. warehousing and retailing, but computers also provide jobs in information technology (IT) and related work. Computers are also allowing jobs to be done by workers with fewer skills.

2. Make a list of jobs that have been created through the use of computers. (5 marks)

There are many jobs available in the design, construction, operation and maintenance of computer systems. Jobs include operators, system analysts, programmers, engineers, managers, data entry operators, consultants, technicians, web page developers, programmers and designers.

3. What types of jobs do computers replace? Give an example. (5 marks)

Computers have replaced people in many unskilled jobs for example, robots are now doing the unskilled factory workers redundant and are now carrying out some manufacturing processes. Computers are also allowing jobs to be done by workers with fewer skills. For example, watches are no longer made by highly skilled watchmakers, but are mass-produced in factories employing semi-skilled workers.
4. How can education assist in solving the unemployment problem? (5 marks)

There is a need for qualified workers such as teachers, nurses etc. as opposed to the non-skilled areas which previously attracted a high employment. Therefore, education can help prepare people for the more skilled workforce.

5. What are the effects of unemployment on our society? (10 marks)

It is very negative. Unemployed people have a lot of time on their hands to do nothing. There is ever increasing unemployment benefits that is a drain on the public purse (i.e. taxpayer’s money is paying unemployed people). They are living off the government and therefore don’t see the need to find a job or seek employment as their needs are already met by basically doing nothing. This is a very negative attitude and a bad example for the next generation of Australia.
Assignment Number 1: Social Implication of Computer Technology.

Answer each of the following questions. Total Mark = 35

1. How have computers affected employment? (10 marks)

Computers have affected employment tremendously. The unemployment rate has been rapidly increasing during the last two decades. Without employing all available workers full time, it is clear that Australia’s goods and services can quite easily cope without people’s service and are better off with computers. After all, computers don’t call in sick, take days off and don’t expect an annual wage rise.

Computers have also created jobs. There are now demands for experts in computer related industries. Although, when it comes down to it, the older the person needing employment the less chance there is that they are skilled with computers and unfortunately, it is not always practical or economical for the employers to train these people with the computer skills required.

2. Make a list of jobs that have been created through the use of computers. (5 marks)

- Designers
- Construction
- Architecture
- System analysts
- Programmers
- Engineers
- Technicians
- Web page developers
- Operation and maintenance of computer systems

3. What types of jobs do computers replace? Give an example. (5 marks)

Computers are replacing many different types of jobs. Unskilled jobs such as factory workers are the most affected and are being replaced be things such as computerized production lines. Computers are also replacing clerical jobs, as programs such as word and excel allow typists to work more accurately and also, the bosses are becoming more computer literate. Computers are allowing people with few skills to replace experts in jobs such as watchmaking too.
4. How can education assist in solving the unemployment problem? (5 marks)

Education can help assist in solving the unemployment problem as there are more job opportunities offered to those who are computer literate and educated. Because things like computers are relied on in any kind of employment such as supermarket employment, managing, home business and so on it becomes necessary to learn the basics, which you do through education.

5. What are the effects of unemployment on our society?

Unemployment has had many different effects on society. All of them bad. However, there are a variety of different circumstances. Unemployment can cause much stress on the unemployed and their families. If the person who is unemployed is over fifty and are unskilled, they find it harder to find another job compared to a younger person who would probably be able train themselves or learn faster. Unemployment usually results in people having to sell their belongings such as their house because they can't afford their mortgage or car because they can't afford to register it. It also makes it harder if they have families that they have to provide for. The unemployed then become vulnerable and insecure and have to rely on their friends and relatives to take care of them.

Unemployment also has other bad effects on society. If the person is desperate for money and has nothing to eat or no clothing, they quiet often turn to stealing or doing other dangerous things, such as supplying drugs, etc. This causes a rise in crime around the society.

However, the unemployed are not the only ones who are effected by their job loss. The people who have not got a job often go on the dole, which is payed for by the tax payers, and the more people who are unemployed, the more money on tax, tax payers have to pay. So it is clear to see, unemployment has many bad effects on society.

Excllent answer
Referee
10/4/10
University of Wollongong
New South Wales, Australia

Author’s Information:

Name: Rebecca Hudson, B.S.E., Maths, M.A., Maths (Honours) thesis

Address: 1 Marie Place
Horsley 2530
New South Wales, Australia

Degree: Master of Education (Honours) thesis
Graduate School of Education

Supervisor: Dr. Barry Harper
Dean of the Faculty of Education
University of Wollongong

Title of Thesis: Implementation of Government’s Computers in Schools Policy: a Case Study

Date of Completion: 30 September 2002

Note: All information or data obtained by the researcher will be kept confidential. All data will be secured in a safe place in electronic and hardcopy form for a period of 5 years after the completion date of this thesis (ethics requirement).