

PREPARING STUDENTS, TEACHERS AND SCHOOLS FOR THE NEW MILLENNIUM

**A Report on Information Technology
in New South Wales Schools**



September 1997

PREPARING STUDENTS, TEACHERS AND SCHOOLS FOR THE NEW MILLENNIUM

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INTRODUCTION - NEW WAYS OF TEACHING AND LEARNING

Importance of computers in teaching, learning, life and job opportunities

“Without Computer Literacy, you are not going to make it in the future”, according to Mavin Cetron of US based Forecasting International.

More than ever before, technology is having a profound impact on the world in which we live.

The ability to access, analyse and evaluate information will be an increasingly vital requisite for full participation as an active citizen of the future.

Teachers and students have always used information from a range of sources. Using electronic networks makes the process of locating information more efficient and adds a new dimension to teaching and learning.

It is now possible to make use of and contribute to information from around the world, preparing teachers and students today for the innovations of tomorrow.

Access to and appropriate use of technology in schools provides students with the skills and knowledge that enables them to actively participate in the ever evolving technology centred world of work. Students who have a clear understanding of technology and their roles and responsibilities as users are able to engage in a diverse range of technology related workplace situations as life long learners.

History

Prior to this Government’s taking office, technology was not a key focus within education. There was a ratio of 1 computer for more than 20 students, computers were only used for a small proportion of classroom time, pre-service and inservice training for teachers in technology was limited and expenditure on computers was only one third of one percent of the total education budget.

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Government's commitments

The NSW Government's Computers in Schools Policy is based on the following long term goals:

- every child should be familiar with computers as a normal educational tool;
- the use of computers across all subjects should be optimised;
- computers should help to achieve educational outcomes more efficiently and with greater quality; and
- students should develop analytical, organisational and problem-solving skills to cope with expanding access to computerised information.

The Government's Computers in Schools Policy is not simply the distribution of additional computers to schools. It is a comprehensive strategy which aims to ensure that schools have access to the latest in information technology, that students and teachers become increasingly proficient in the use of technology to assist their learning and teaching and that training and support is provided to allow the best use of the technology available. Curriculum support material incorporating the use of technology is constantly being developed and provided to schools as well as assistance to school communities to help them develop school-based policies on Internet access and use.

Approved funding for the Computers in Schools Policy totals \$186.4m over four years and provides for:

- the connection of all schools to the Internet;
- the appointment of forty technology advisers;
- 124 computer coordinator positions to support secondary schools, leading to the provision of a full time coordinator in each high and central school;
- the training of 15,000 teachers;
- the development of curriculum support materials; and
- the distribution of over 55,000 computers.

The Government's Computers in Schools Policy covers both Government and non-Government schools. While the focus of this document is on technology provisions for Government schools, agreement has been reached with the non-Government sector to include the cost of computers for Government schools in the calculation of per capita grants payable to non-Government schools. In this way, non-Government schools will receive the financial benefit of this commitment on an on-going basis. Because the distribution of funds to non-Government schools is based on a 12 category needs based classification, the most disadvantaged schools will receive a greater share of the funding.

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Overview of program and policy

The Government's Computers in Schools Policy aims to improve learning outcomes for all students in all learning areas, from Kindergarten to Year 12, and recognises that computer-based technologies provide a significant educational resource for achieving this aim.

The policy provides schools with:

- state of the art computers;
- access to the Internet;
- curriculum support material;
- Technology Adviser support in every district;
- training and development to increase teacher confidence and proficiency with technology; and
- satellite delivery of educational materials for country schools.

The Department of School Education launched one of the most innovative and extensive websites in Australia in May 1997 to give teachers and students a window to the world. The new website, Network for Education, will prepare our students for the future, equipping them with the skills they require to secure jobs, take on further study and fulfil their potential.

Awards

As an indication of the Department's role as a leader in technology, a number of schools and the Department itself have won awards for innovation in technology in both administration and teaching and learning.

Departmental Awards

The Department of School Education received a gold award in the Tenth Government Technology Productivity Awards in 1997 for:

- the Internet project which connected all NSW Government schools to the Internet;
- the Help Desk project which provides a technology telephone support service to teachers and school administrative staff; and
- the wide area network project which linked the Department's state office to forty district offices and non metropolitan state offices across the State.

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The Department of School Education was awarded a “high commendation” in the category of Process Improvement at the 1997 Prime Minister’s Awards for Innovation in the Public Sector for its Asset Management Strategy. This innovative use of technology comprises integrated modules providing spatial and aspatial information on land which the Department owns, leases, has control over or is interested in acquiring, as well as on complete records of school buildings and grounds down to floor coverings and types of heaters. These inaugural awards were presented to organisations identified across all levels of Government throughout Australia, as having made outstanding achievements in improving services or implementing innovative practices.

A project devised by the students at Elanora Heights Public School won a top award at the International School Cyberfair 96, a global competition celebrating the power of online communications to unite students worldwide.

In 1997, Dubbo South High School received top awards in the same competition for creating a website of the Western Plains Zoo.

A national competition to set up Internet Web sites conducted in 1997 by the New South Wales Department of School Education in partnership with Access Australia was won by seven NSW State schools. First division prize winners were Wyong Public School and East Hills Boys High School. Second division prize winners were Gulgong Public School, Evans Head Public School, Gymea Technology High School, Taree High School and Toormina High School.

Summary

The Government’s Computers in Schools Policy has placed NSW schools in the forefront of technology innovation and access and has afforded NSW recognition as a national and international leader in equipping students to meet the challenges of a technology driven world.

The Government’s foresight, leadership and commitment in ensuring that students are able to access information through technology and skilled in processing and analysing this information provides a significant and vital investment in the future of our children and our State.

BETTER RESOURCES - EQUIPPING STUDENTS AND SCHOOLS FOR THE NEW MILLENNIUM

Computer distribution

The Computers in Schools Policy will enable the distribution of more than 55,000 computers to schools by June 1998. In 1996 2,307 computers were provided to schools for the Internet

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program. In February 1997 the distribution of 22,138 computers commenced and will be completed by the end of term three 1997.

1st Phase

The first phase of the distribution of computers was aimed at achieving the Government's objective of reducing the computer to student ratio from 1:20 to 1:14 or better in every state school. The distribution was based upon a survey undertaken in August 1995 and took into account the existing number of computers in schools used for teaching and learning, acquired by schools either by purchase or lease in the period 1992-1995.

2nd Phase

The phase two model provides for:

- distribution according to a per capita model based upon student enrolment;
- the provision of schools with a choice of computer equipment, including laptops within the school's base entitlement measured in desktop units. Under the proposed model schools would be free to determine the most appropriate mix of computing equipment to meet their particular needs within their total allocation, including the use by teachers and students of laptop computers at home. The total allocation, determined by enrolment would be the basis for all calculations of computer to student ratios.

For example, a school with an enrolment of 400 students would have a notional entitlement of 27 computers. From within this notional entitlement the school may choose to select 2 network servers (equivalent of 6 desktops), 15 portable devices such as the Apple Emate (equivalent of 5 desktops), 4 laptops (equivalent of 8 desktops) and 8 desktops.

The phase two distribution is due to commence in term 4 1997 and will be concluded in June 1998.

3rd Phase

An additional pool of 2,200 computers will be targeted to the needs of special groups including students with high support needs, distance education and special education students in mainstream classes and new and developing schools.

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The following table indicates the total number of computers that schools will have received under the Computers in Schools Policy. The table is indicative of the likely computer distribution based on 1997 enrolments.

Level	Enrolment Range	Number of Computers
Primary Schools	0 - 25	2 - 3
	26 - 100	3 - 8
	101 - 200	8 - 14
	201 - 300	14 - 21
	301 - 500	21 - 33
	501 +	33 - 65
Central Schools	0 - 200	2 - 15
	201 - 500	15 - 31
	501 +	45 - 83
SSPs	0 - 25	2 - 10
	26 - 150	10 - 51
High Schools	0 - 500	2 - 33
	501 - 700	33 - 46
	701 - 1000	46 - 65
	1000 +	65 - 100

In addition to the above distribution a further 2,200 computers will be distributed to meet special needs.

Internet connections

All schools were connected to the Internet by December 1996. Total funding for this program approximates \$23m, comprising capital expenditure of \$6.6m and \$16.4m in recurrent costs. As part of the \$23m program, a total of \$3.5m has been distributed to schools since December 1996, to subsidise schools in remote locations requiring STD access to the Internet. This interim arrangement provides equity of access to remote schools and will be reviewed in light of the recent telecommunications deregulation.

Satellite

The NSW Department of School Education has over 1400 sites equipped with systems for

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reception of analogue satellite transmissions.

The successful use of satellite technology to provide educational services to schools throughout the State is leading to an increased role for satellite delivery. Over 170 hours of high quality transmission lesson material are planned for satellite delivery in 1997 with transmissions exceeding 200 hours programmed for 1998.

Interactive satellite sessions have been successfully held with students and teachers calling advertised free call 1800 numbers which connect them directly to the production studio and allow them to ask questions and actively participate in the broadcasts.

The increasing role for satellite delivery has included the NSW Department of School Education leasing satellite services to other similarly geographically dispersed Government Departments (eg., NSW Police) to allow their staff throughout the State to receive vital communications in a timely and efficient manner via meetings held at the local school using the school's satellite facilities.

In areas of the State that presently have no viable terrestrial alternatives, satellite delivery becomes the only method for providing reliable quality voice and data. Digital satellite services in such locations will provide send and receive ability which can be used for higher bandwidth applications such as Internet access, pay TV and videoconferencing for remote teachers, students and the development of new Schools of the Air.

As satellite infrastructure is easily deployed and reception is independent of geographical location within the State, such services provide an important educational resource for rural and remote schools.

THE INTERNET - LINKING STUDENTS, CLASSROOMS AND SCHOOLS TO THE WORLD

All schools linked

All schools received at no cost the following:

- an Internet computer of their choice;
- a modem and dedicated telephone line;
- access to OzEmail for connection to the Internet.

The Minister launched the Department's Internet (public access) and Intranet (school and Departmental access) in May 1997. Schools are incorporating Internet technology into their

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curriculum with more than 550,000 requests for web pages per day. This represents some 3.5 million minutes of connection time per month.

The Internet provides students and teachers with access to a world of information at their fingertips. It makes diverse resources instantly accessible and contains both more, and more up to date information than can be found in textbooks.

School communities have been asked to develop a policy relating to student use of the Internet. The Curriculum Directorate publication *Student access: developing a school Internet policy* provides guidelines and practical ideas for developing an Internet usage policy.

Already many schools have contacted their district technology advisers and have commenced the development of their policies.

Network for Education

The NSW Department of School Education website *Network for Education* was launched on May 18, 1997.

Network for Education provides content and activities in four sections: staff, students, community and the Department of School Education.

The staff section provides educational and training material, projects, employee related information and a forum for professional discussions.

The students' section provides a stimulating environment that assists students to explore and apply Internet technology to their learning. Activities and materials provided for students include ideas for student projects, educational reference material such as the Macquarie dictionary and various national and international newspapers, opportunities to publish and view student written and art work, an avenue for the State Student Representative Council to communicate with its student members in all schools, as well as information about tertiary study and career opportunities. The web site provides access to an extensive range of career education and vocational education information. Sites such as 'Careers on Line', 'Aussie Career Guide' and 'HSC On-line', TAFE and Universities, accessed through the DSE web site, inform students and parents of the full range of post school options. The site also aims to showcase student achievements in fields such as sports.

The community section provides information for parents and the wider community about schools and the Department.

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The DSE section provides information about the Department's priorities, policies, organisational structure and services.

HSC On-line

This project is a joint venture between Charles Sturt University (CSU) and the Department of School Education allowing HSC students to access up to date information through the Internet. The project has been developed by teams of teachers working with co-ordinators from Curriculum Directorate and from CSU.

There are currently nine subjects on-line: Agriculture, Computing Studies, Drama, English, Geography, Japanese, Mathematics, Ancient History and Modern History. Nine more subjects are currently under development and most will be on-line by the end of Term 3 1997. These are Aboriginal Studies, Biology, Business Studies, Design and Technology, French, Music, PDHPE, Studies of Religion and Visual Arts.

The site also houses communication facilities such as newsgroups which allow teachers and students to interact on-line. A teaching and learning area allows users to access an on-line journal and to join in debate or exchange ideas.

The site currently contains 5500 pages. There are 4000 users accessing the site each day and this rate is increasing by 100% each month.

CURRICULUM - TEACHING AND LEARNING FOR THE NEW MILLENNIUM

New curriculum materials

New syllabuses and support documents which include advice on the appropriate use of computer-based technologies to achieve syllabus outcomes are being developed by the NSW Board of Studies.

Syllabus support will include information about relevant computing resources. As syllabuses are developed they will incorporate content on the use of computer-based technologies in the subject area. For example, creating digital images will be suggested in visual arts.

The revised English K-6 Syllabus acknowledges the increasing availability of computers in schools. It provides clear direction for teachers, incorporating the necessary content and learning outcomes, to develop and monitor students' knowledge, skills and understanding when using technology.

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The vocational Content Endorsed Course in Information Technology, available to a selected number of schools in 1998, will provide Year 11 and 12 students with the opportunity to develop industry recognised skills that assist them in employment as well as articulating into further industry specific training.

Some current syllabuses include targeted outcomes requiring the use and understanding of computer-based technologies and their impact and applications in society. For example, the *Design and Technology Year 7-10* syllabus requires that at least 50 hours (of the mandatory 200 hours) must be devoted to learning about and using computers.

Use of the Internet for teaching and learning

The Internet is rapidly becoming a part of the everyday classroom routine.

connect.edu: Internet in teaching learning has been developed to support teachers in the use of the Internet in class activities. The document provides examples of activities and step by step advice on how to use aspects of the Department's Website service.

The document will be distributed to schools in Term 4 1997. It will also be available on the Department's Website, *Network for Education*, and regular updates will be provided on-line.

Internet projects for students are located on *Network for Education*, the Department's Website. They address a range of curriculum areas and provide opportunities for students to use the Internet to participate in collaborative activities, communicate with others and publish to a wider audience. Some examples of student use of the Internet follow.

Year 9 Design and Technology students in the Mt Druitt area enjoyed a taste of the Pacific while exploring the topic of leisure and lifestyle. The class used the Internet to find potential sites to visit on their virtual tour. They set up interviews with interesting people to visit, investigated the documentation needed to enter each country, and contacted the tourism bureaus. All of these activities were achieved without leaving the classroom.

Students from NSW and the United Kingdom have access to a robotic telescope via the Internet. This provides students with the ability to study the night skies in both the southern and northern hemispheres. The robotic telescope is located in Bathurst, NSW and links have also been made to the Bradford telescope in the UK.

Two Year 6 classes were engaged in an environmental Internet project where they researched issues in their own community. They contributed their findings to other schools around the world, engaged in similar projects. Activities focused on students researching weather events, cloud

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formations and water pollution in their local area. The students were able to compare their location information with information from around the world.

An international athletics competition was organised via the Internet. The idea, originated from a school in Scotland, was to have identical athletic events run throughout the world. Students ran the races, recorded the results and sent them to Scotland. The students' sense of anticipation was overwhelming as they awaited their e-mail results. They won a gold and two bronze medals!

Year 11 students in the Newcastle district dabbled in the stock market by participating in the ASX share market game that is run on-line. Student stockbrokers traded shares, built up portfolios, some developing expertise in the futures, commodities and money markets. Most found the notional \$50,000 a very fleeting thing and the hole in the pocket syndrome achieved epidemic proportions.

Internet site reviews are located on *Network for Education* and published in a resources journal for teacher librarians. These reviews support teachers in selecting quality, appropriate sites to support teaching and learning in the full range of key learning areas K-12, and in departmental priority areas such as literacy, technology, aboriginal education, and child protection.

Reviews of other resources such as books, videos, CD-Rom and computer software are also located on *Network for Education*.

Support materials

KLA support for secondary schools

Eight secondary documents, one in each key learning area Years 7-10, are being developed to assist teachers to incorporate computer-based technologies in their teaching practice.

Each document provides activities and ideas that specifically address existing syllabus outcomes and demonstrate a range of experiences relevant to the learning area. Models of classroom organisation and school-based management issues are also included.

The draft documents have been distributed to all secondary schools for consultation. The finalised documents will be published in Term 4 1997.

KLA support for primary schools

A primary document *Computer-based Technologies in the Primary Classroom* provides practical ideas and strategies for classroom activities in all key learning areas.

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The activities are organised in categories that describe ways to enhance learning by using computer-based technologies. These include using facts and figures, words, images and finding solutions. Specific advice relating to keyboard strategies is emphasised.

For each section a wide range of additional ideas is provided. Activities incorporating the use of the Internet are featured throughout the document. The organisational structure of the document provides a model for integrating computer-based activities across the key learning areas.

As with the secondary documents, the inclusion of management strategies has been well received. In many cases schools are already incorporating the strategies into their school planning and classroom programs. For example, Copacabana Public School has developed its technology plan to include a focus on developing computer-based capabilities from Kindergarten to Year 6.

HSC On-line

HSC On-line has provided students and teachers with unprecedented access to specially prepared subject and resource material, tutorials, valuable study exam and study advice and access to past HSC exam papers and examiners comments.

“It’s absolutely amazing the information you can access” said Fiona McHatton, a Year 12 student at Bathurst’s Kelso High School, in the central west of NSW. “It’s so easy to use and has tremendous resources. It’s really changed my perspective on some of my subjects and given me confidence.”

An example of the material of the HSC On-line is in the area of Mathematics. Interactive tutorials in Mathematics provide students with specialised content which has been presented in an informative and exciting way using the potential of the Internet. Students can study the effective use of calculus using animated slide shows written by specialised teachers.

Satellite delivery

Access to languages via satellite

The Access to Languages via Satellite (ALS) program in New South Wales is part of an integrated program of support for primary teachers in the introduction and expansion of languages other than English. The NSW Department of School Education produces programs in Chinese and Japanese at beginners, continuers and advanced levels.

The ALS programs include two thirty minute satellite broadcasts per week in each language at each level. The language components of the broadcasts are delivered wholly in the target

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language and focus on students' use of the target language.

In addition a significant amount of print and audio support is provided to teachers to implement the language programs.

There are approximately 50,000 students using the program in Government and non-Government schools across Australia. This represents 300 schools in NSW alone.

Early Literacy Initiative - Learning and Literacy

In 1996 twelve programs were developed and delivered by satellite to rural areas, and by video to schools where satellite reception was unavailable. The programs were designed to support the improvement of literacy outcomes of students in Kindergarten to Year 3, in low socio-economic contexts.

The live-to-air format encourages interaction with studio presenters around the issues being discussed. This allows for immediate response to participants and provides added stimulus for discussion. A major component of the program was the development and maintenance of in-school and between-school teacher networks.

In term of equity, the use of live satellite and the potential for personalising communication has been an important feature.

In 1997, based on evaluation findings, the Early Literacy Initiative (ELI) continued the series with another twelve programs, available either by satellite or on video. The number of schools applying to receive the broadcast has increased in the second year of the series. It is currently being accessed by 700 students as well as by ELI and literacy consultants around the State, and demand is continuing to grow.

Count Me in Too

The *Count Me in Too* project is an early numeracy program which examines the arithmetical strategies of students in Kindergarten to Year 2. Satellite broadcasts have been used to introduce teachers to the Early Learning Framework in Number, to provide teaching activities to support student learning and to focus on assessment strategies and practices.

Teachers have greatly benefited from the opportunities to interact with academics, expert teachers and other participants in the project, as well as being able to share their experiences with teachers across the State, as they work through the program.

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Satellite broadcasts are also used to support other programs.

Software Agreements

The Department of School Education is actively negotiating preferential licence pricing for schools and where possible State wide licensing. This provides schools with a cost effective means to purchase software to install into the computers provided through the Computers in Schools Policy.

Already a NSW site licence has been negotiated for Encyclopaedia Britannica and Claris. A preferential pricing structure has been negotiated with Encyclopaedia Britannica and the agreement with Claris provides schools with access to a whole suite of educational software packages at significantly reduced prices and with special pricing for teachers.

CD-ROM publishing

The Japan Album

In 1996, the Department produced *Japan Album*, a multimedia CD-ROM learning resource to enhance the study of Japanese in partnership with Unisearch Multimedia.

Japan Album teaches Japanese through highly interactive activities which bring Japanese to life through video, sound and animation. It includes a speaking dictionary of Japanese words.

Following the outstanding success of *Japan Album*, the Department is planning to develop further multimedia language resources.

Language for learning Years 5-8

This CD-ROM provides support for teachers to implement literacy strategies in key learning areas for Years 5-8. It includes explicit strategies for improving students' literacy achievements.

The interactive format allows teachers to gain access to demonstrations of classroom teaching practice, using video footage and expert commentary; current research; student work samples; and case studies of effective whole-school literacy programs.

The CD-ROM, to be published at the beginning of Term 4 1997, will be a significant resource for implementing literacy across the school, with an emphasis on transition from primary to secondary.

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SPECIALIST STAFFING AND TRAINING - A NEW GENERATION OF TEACHERS

Technology Advisers

In April 1996 forty technology advisers were appointed to District Offices throughout the State. These advisers, working in conjunction with curriculum and training and development consultants, assist schools with the development of technology plans.

The Technology Adviser's primary role includes:

- assisting schools in developing technology plans to support and school and Department priorities;
- providing technology advice to schools on local area networks, personal computer hardware and software, communications and technology purchases;
- working in collaboration with curriculum consultants in advising teachers on how they can use technology to enhance their teaching programs; and
- working with Training and Development consultants in delivering technology training.

15,000 teachers trained

The Computers in Schools Policy aims to ensure that 15,000 teachers, who have not previously had the opportunity to use computer technologies in the classroom, have access to appropriate training in the use of computers and related technologies

The strategy includes the following training and development components:

- a 30 hour training course Technology In Learning And Teaching (TILT) for K-12 teachers in educational uses of technology in all subjects;
- educational use of the Internet and other on-line services;
- training for TILT facilitators and Technology Advisers.

TILT

The TILT program is designed to develop the technology skills of teachers and to promote the

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application of technology in teaching and learning across the curriculum from Kindergarten to Year 12.

At 30 June 1997 4,955 teachers had been trained. 8,194 teachers will have completed TILT training by the end of 1997, with a further 6,806 teachers undertaking training by mid 1999.

Participants receive three days relief to take part in the program.

The TILT training and development program for teachers has six components which cover the following areas:

- Application software and keyboard skills;
- The Internet and other on-line services;
- Computers and related technologies;
- Using technology in all subject areas;
- Classroom teaching practices and classroom management issues;
- Future directions.

Each of the six components comprises a one hour video, a two hour hands on workshop and in-school follow up activities.

All principals have received a training package to help them support the implementation of TILT in their schools. The satellite broadcast component of the TILT program is available to all teachers on the SBS television program *TVED*. Additional TILT materials are freely available on the TILT homepage on the Department's Website.

Teachers' responses to TILT

A small sample of Semester 1, 1997 participants responded to a survey on:

- the effectiveness of the training provided;
- the extent to which TILT had met their professional needs; and
- the changes they had introduced into their own administration and classroom since their participation in TILT.

123 respondents replied to the survey. 64% of respondents taught primary students and 36% taught secondary students. 49% of respondents taught in metropolitan schools and 51% in non-metropolitan schools. 75% of respondents were assistant teachers and 25% were school executives.

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Participants were asked to identify the most useful activities in the TILT program and to provide their reasons.

The most valued activities were the Internet, word-processing and the introduction to the basics in the first component.

The majority of respondents reported that their confidence in using computers had increased as a result of TILT and that they felt more confident about using computers with their students.

“Prior to the course, I had some very useful skills, mainly in the area of word-processing. So my expertise was very narrow. TILT introduced me to so many other aspects of computer technology which I otherwise .. would have avoided because of lack of confidence. I am now much more confident in exploring programs and solving my own problems by at least, trying a few possibilities..”

Assistant teacher, metropolitan primary school.

The most frequently reported change to practice was in the teachers' use of word processing for administrative purposes, including the use of spreadsheets. In classroom practice, the most frequently reported change was in the planned use of computer technology with students. 45% of respondents reported that they were assisting students with the computer, giving more opportunities for students to use the computer and encouraging students to experiment with other software and resources.

“TILT program has given me the confidence and basic knowledge to go forward and expand the use of technology in our Creative Arts faculty. I will be able to encourage and lead other teachers in the use of our computer music programs and am already helping senior music students with their classroom work...”

Advanced skills teacher, non-metropolitan high school

Internet contact person

Each school has an Internet Contact Person who supports the use of the Internet in the school. The Internet Contact Person has been provided with a one day training program at a local university or TAFE college. Eighteen training institutions conducted programs in thirty sites across the state. A total of 2,632 teachers have received this training.

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TILT Facilitators

Seventy six teachers, with expertise in the educational use of technology and experience in conducting training and development activities with adults, have received training as TILT facilitators. Facilitators conduct TILT workshops and support participating teachers in their schools.

97% of respondents affirmed the high quality of their TILT facilitator in delivering the program and 74% of participants were very pleased with the follow-up support provided by the facilitator. Technology Advisers in all districts have also participated in TILT training.

University teaching training

The report of the Ministerial Advisory Council on the Quality of Teaching *Computer Proficiency for Teachers* was published in June 1997. The recommendations include minimum proficiency for graduates of initial teacher education courses, equity of access to computer technology for all Government and non-Government students; graduate certificate courses for computer competencies; and proficiencies to be included in the document *Desirable Attributes of Beginning Teachers*.

The Minister is writing to the Vice Chancellors of NSW universities to inform them that the Department will require new teachers to have proficiency in the areas of educational use of computers, as set out in the report, by the Year 2000.

TECHNICAL SUPPORT - EXPERT ASSISTANCE FOR EVERY SCHOOL

Technology Support Strategy

Following restructuring in 1995, the Department of School Education was faced with the task of providing the best possible support for use of technology in administration and education in 2222 schools across New South Wales.

All schools, no matter where they were located, needed to be able to get support in resolving technology related problems with school systems such as OASIS and the Internet for the cost of a local call.

A solution for these challenges involving the establishment of a Call Management Centre was developed and has been phased in since July 1996. This innovative approach was recognised by a Federal Government Technology Productivity Gold Award.

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The Call Management Centre uses sophisticated Help-desk and telephony technology. Advisers are based in Newcastle, Bathurst and Wollongong, but by calling the same number from anywhere in the State, schools can gain access to personnel with the appropriate skills in the most efficient manner possible at the cost of a local phone call. The system distributes calls across the three locations on the basis of operator availability in order to minimise response times. In cases where officers logging a call are unable to resolve the problem, the system automatically allocates the problem to the most appropriate support officer based on matching officer support skills with problem criteria. The result is a “virtual single office” where call centre managers can use queue management and ensure that problems are resolved in the minimum time.

The system provides operators with a comprehensive solutions database which gives them immediate access to solutions for the most common problems. This allows for quick diagnosis of the problem and therefore quick resolution.

Over 30,000 problems were logged by teachers and school administrative staff during the first year of operation. Approximately 75% of problems were resolved on the day they are logged and over 98% are resolved within five working days.

The Call Management Centre has also initiated a remote access hardware and software support and diagnostic service which allows for the resolution of problems, thus minimising costly on site visits and schools being without access to their technology for long periods of time.

The monitoring of the Call Management Centre, allows for the identification of training and development needs and provides useful data for evaluating software packages and hardware contracts.

Computer co-ordinators

From the beginning of the 1998 school year, 124 positions will be provided for computer co-ordinator support in schools. This will be increased to provide a full time co-ordinator in each secondary and central school.

The computer co-ordinator position will complement the role of district technology advisers, curriculum and training and development consultants by:

- acting as a point of contact for staff and community for information about computer

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based technologies, professional associations, curriculum matters and provision of classroom support to teachers using computer technology;

- supporting the training and development of staff in the use of technology;
- co-ordinating the acquisition and maintenance of computer hardware and software; and
- advising on future strategic implementation of technology within schools.

TECHNOLOGY IN ADMINISTRATION

As well as focussing on technology for teaching and learning, the Department of School Education has emphasised the need for innovation and continual upgrading of technology in the area of administration.

School Administration

The Department's suite of school administration and library software has been in operation in schools since the 1980s.

Since then, the Department has continued to update the software to reflect the needs of schools in the area of administration.

Future upgrades of the software will utilise the latest technologies to address emerging needs of schools and the Department including electronic data collection from schools, financial management, processing of leave, payroll and payment of accounts.

The Minister is expected to announce shortly further measures to improve the communications network between schools and the Department.

Computerised Personnel Systems

The Department is developing a comprehensive Leave Management System which will allow teachers' leave entitlements, such as long service leave and leave without pay, to be calculated within minutes. This system will be extended to leave for administrative staff in offices and schools.

The computerised staffing system is able to match teacher vacancies with appropriately qualified teachers for all State schools. The AS400 personnel system improves the efficiency

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of staffing procedures statewide and ensures all schools are staffed at the start of each term with qualified teachers.

The School Staffing Unit has developed Employment and Transfer Forms that are computer scanned and loaded into the AS400 personnel system. Over 1,000 forms can be loaded into the AS400 in a 24 hour period. This process will improve the filling of teacher vacancies in schools and provide a better service to teachers.

Asset Management System (AMS)

The overall AMS will be a comprehensive series of integrated modules to facilitate better decision making with regard to the acquisition, development, disposal, maintenance and utilisation of the Department's property assets valued at over \$13.5 billion. The system underpins the process of providing facilities for teaching and learning equitably across the State.

The first stage of the AMS, AMS1, was successfully implemented in all State offices in July 1996. Key features included:

- a *Sites Management module* which provides a comprehensive spatial and aspatial record of all the land that the Department owns, leases, has control over, or is interested in using/acquiring; and
- a *School Facilities module* which provides spatial and aspatial information on the Department's school buildings, rooms, demountables, amenities and the elements associated with each of these (eg., room floor covering, heater type, etc.). This includes plans/diagrams of school grounds and facilities.

ASM2, expected to be fully implemented in all State offices during 1998, will include:

- an *Asset Planning module* to provide a support system for making informed decisions on resource allocation issues such as requests for new works or upgrades, and rationalisation of property assets;
- an *Asset Maintenance module* to provide functions for the effective management of all aspects of maintenance to school facilities;
- a *Demountable Management module* to maintain data, including relevant graphic data, pertaining to demountable buildings.

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As part of the total project, nearly all schools have received a folder containing a full set of scaled drawings of their school, together with an aerial photograph and details relating to buildings and other materials and room usages. All schools will have received their folder by the end of Term 4 1997.

In another innovative use of available technology, the School Condition Assessment System (SACS) is being used by contractors across NSW to capture data on the condition of various elements within school grounds, buildings and rooms. SACS runs on a hand-held computer with a pen-based interface. It is able to graphically display plans of school buildings and rooms from the AMS. Condition assessment data captured in the field is loaded into the AMS database, to ensure a reliable resource.

RURAL AND REGIONAL NSW - AN EQUAL PARTNER IN THE NEW MILLENNIUM

Best facilities regardless of address

In developing and implementing the Computers in Schools Policy the needs of regional and rural schools were a primary consideration. The policy provides all schools regardless of their location with:

- **state of the art computers:** Of particular benefit to regional and rural schools is the return to base warranty that covers the computers for the term of the lease. This means that the cost of repairs under the terms of the warranty, including shipping charges, to these computers will not be charged to schools. This is important for schools that are a considerable distance from population centres where shipping charges can add significantly to the cost of computer repairs;
- **access to the Internet:** The Department provides subsidies to defray the Telstra STD call charges for those schools that do not have local call dial-up access to the DSE Internet service. These subsidies directly benefit the most isolated country schools.

Students and teachers from across the State are making regular use of their Internet connection as can be seen by the 550,000 requests for web pages equating to 3.5 million minutes of connection per month.

Distribution of Departmental policies and documents by the Internet means that rural, regional and remote schools are able to receive the information at the same time as schools in the metropolitan area.

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- **curriculum support material:** The provision of these materials to all schools in printed form and via the Department's Internet service will facilitate better access to current information and support improvements in the use of these technologies in the classroom;
- **technology adviser:** A Technology Adviser is located in each district office providing local support and advice regarding the planning for and use of computer based technologies in schools. With Technology Advisers located close to schools, the unique needs of local communities can be better catered for. This is particularly important for isolated rural communities where the support services usually found in metropolitan areas can be more difficult to access;
- **training of teachers:** At least one trained facilitator in each district will organise and present the Training in Learning and Teacher (TILT) course to participants. The use of a variety of strategies to support the course including release time for participants and the use of the Internet to facilitate mentoring and sharing of experiences is of particular benefit to teachers in isolated and single teacher schools;
- **telephony:** The Department of School Education has introduced several one three telephone numbers to schools to allow them access to support teams located across the State at the cost of a local call. Remote and rural schools can now contact these support groups on matters such as staffing, technology and properties without having to incur excessive STD costs; and
- **satellite:** Satellite receiving equipment has been installed in all country schools. This equipment allows schools to receive a variety of educational material. Programs currently being delivered include those in the Access to Languages via Satellite (ALS) program as well as professional teacher training material such as the Technology in Learning and Teaching initiative.

The existing equipment receives transmissions in analogue form. Work is progressing towards upgrading the existing equipment to use digital technology. It is anticipated that a greater variety of programs will be transmitted which will enhance the delivery of educational curricula as well as improving the training and development of teachers.

Bringing the world to every classroom

Equitable access to information for students and teachers in schools remote from the major population areas is essential if these students are not to be disadvantaged by their location. Access to the Internet for these students brings the information and communications opportunities provided by this medium directly to their classrooms.

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Internet connections

The Department provides subsidies to defray the Telstra STD call charges for those schools that do not have local call dial-up access to the DSE Internet service. These subsidies directly benefit the most isolated country schools. The Department is working with telecommunications providers to ensure that the quality of service to schools in remote locations is continually enhanced.

Students and teachers from across the State are making regular use of their Internet connection as can be seen by the 550,000 requests for web pages equating to 3.5 million minutes of connection time per month.

Rural and remote schools have taken advantage of this access to the Internet to interact with other schools and sites across the State, interstate and overseas. These experiences would be very difficult, if not impossible, without this access.

Training and support

Training and Development Directorate has made a strong commitment to supporting staff in isolated and rural areas by focusing on the delivery and support of training and development using new and emerging technologies. Pilot studies to investigate expanding the use of technology and telecommunications to deliver training and development are in place. These studies include establishing moderated "newsgroups", producing an electronic journal to encourage professional discourse, expanding the development of self-paced modules available on CD-ROM and using satellite and cable delivery, video conferencing and collaborative computing.

Technology has been used to support teachers in the flexible delivery of programs and the maintenance of networks in rural and regional areas in the following ways:

- access to the DSE Web site;
- development of CD-ROMs such as Language and Learning - Making the Links, Literacy for Learning Years 5-8;
- CD-ROMs to support country teachers of the HSC;
- a CD-ROM simulating English marking was sent to all country high and central schools as a pilot in 1995. A CD-ROM to support teachers of Science was sent to all non-metropolitan high schools in August 1997. The CD-ROM is a joint initiative of

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the Board of Studies and the Department and was developed by NSW science teachers with HSC marking experience. It included sample scripts, marking scales, briefings by examiners and simulated marking exercises in Biology, Chemistry, Physics and General Science;

- development of videos such as the School Finance Management Training video. The video has been developed in recognition of the isolation of senior school assistants who need additional support to their network at a particular time of year;
- on line discussions. For example the current literacy on-line discussion which provides every teacher in the State with opportunities to share ideas and participate in professional development;
- development of satellite broadcasts such as the Early Learning Strategy and the Child Protection Training Strategy which is also supported by a video;
- satellite broadcasts have also been transmitted to all non-metropolitan HSC teachers in 1995, 1996 and 1997. In 1995 the broadcast focused on generic issues in last minute preparation for teachers of HSC students. In 1996 the focus was Mathematics and in 1997 the focus was on Human Society and its Environment.

Internet training is being planned for senior school assistants and school assistants working in the library. The Internet will be used to establish a network to address isolation by improving access to current information and training and development programs.

Staffing

The technology needs of rural and remote schools are supported by Technology Advisers who are placed in each district. Technology Advisers provide local support and advice regarding the planning for and use of computer based technology. With Technology Advisers located close to schools, the unique needs of local communities can be better catered for. This is particularly important for isolated rural communities where the support services usually found in metropolitan areas can be more difficult to access.

In addition, rural and remote schools have access at the cost of a local call to a Call Management Centre which provides telephone support for technology related problems experienced by teachers and school administrative staff.

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Satellite

Satellite receiving equipment has been installed in all country schools. This equipment allows schools to receive a variety of educational material.

The existing equipment receives transmissions in analogue form. Work is progressing towards upgrading the existing equipment to use digital technology. It is anticipated that a greater variety of programs will be transmitted which will enhance the delivery of educational curricula as well as improve the training and development of teachers.

Programs currently being delivered include those in the Language Other Than English initiative as well as professional teacher training material such as the Technology in Learning and Teaching initiative.

There are currently 127 P5, 36 P6 schools and 51 Central schools enrolled in the Access to Languages via Satellite (ALS) Programs. This represents approximately 45% of the total enrolments.

An evaluation conducted in 1995 confirmed that students, particularly in rural schools, benefitted significantly from the provision of these programs. It opens up the world and is great for students in rural areas with little experience of the wider world reported a teacher in a one teacher school.

A cluster of primary schools in the Albury District including Burrumbuttock, Springdale Heights and Lavington primary schools is now able to offer the study of Mandarin to their students. Isolated and one teacher schools such as Crossmaglen Public School have been able to provide access to the study of Japanese language and culture. Of great significance for rural schools is the opportunity afforded by the satellite language program for students to be steeped in a multicultural environment.

HSC On-line

Links from HSC On-line to Australian and international sites have enabled all students and teachers access to the global community and a wealth of information. English students can locate valuable drama information on Hamlet through the Hamlet Home Page; Agriculture students can find the latest research on landcare through the Landcare Web Home page, Japanese students can study the detailed history of the Cowra War camp on the Cowra home page; Geography students can research ecosystems at the Bio Diversity content page.

Students and teachers, from rural to metropolitan areas participate in on on-line communication newsgroup for Computing Studies. The newsgroup provides a forum to share

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ideas, seek solutions to problems and exchange information on useful resources.

Students from rural and remote locations also have access to the Broadening Horizons section which provides information and advice on post school options including tertiary education and vocational education courses.

Software Agreements

The Department of School Education is actively negotiating preferential license pricing for schools and where possible State wide licensing. This provides all schools, particularly small rural and regional schools, with a cost effective means to purchase software to install into the computers provided through the Computers in Schools Policy.

Already a NSW site licence has been negotiated for Encyclopaedia Britannica and Claris. A preferential pricing structure has been negotiated with the Encyclopaedia Britannica and the agreement with Claris provides schools with access to a whole suite of educational software packages at significantly reduced prices and with special pricing for teachers.

CONCLUSION

Computer literacy skills will be a crucial factor in ensuring a secure future for our students.

The workforce our students will join is becoming increasingly widely distributed by the development of communication links. 90% of all information that workers access will be available on line and through telecommuting work will be done anywhere, anytime and any place where there is a phone line. Significant efforts are required to prepare our students to meet these challenges.

The Government's Computers in School Policy is a comprehensive strategy which aims to ensure that schools have access to the latest in information technology, that students and teachers become increasingly proficient in the use of technology to assist their learning and teaching and that training and support is provided to allow the best use of the technology available. Curriculum support material incorporating the use of technology is constantly being developed and provided to schools as well as assistance to school communities to help them develop school-based policies on Internet access and use.

Our students and teachers have embraced the strategy wholeheartedly as can be seen by the 550,000 requests for web pages per day equating to 3.5 million minutes of connection time per month, the interaction with sites and schools interstate and internationally and the awards that students and schools have received.

At the same time considerable effort is being expended to ensure that the infrastructure of the Department of School Education is constantly upgraded to enable it to provide effective and efficient support to schools and students. These efforts have been recognised by the awards received for technology and innovation.

The Government's leadership and commitment in ensuring that students are able to access information through technology and skilled in processing and analysing this information provides a significant investment in the future of our children and our State.