

# Embracing e-Learning in Australian Schools



Prepared by  
Dr Dale Spender and  
Dr Fiona Stewart

May 2002

Proudly sponsored by  
**Commonwealth** Bank



# Embracing e-Learning in Australian Schools

Prepared by Dr Dale Spender and Dr Fiona Stewart

May 2002

The Commonwealth Bank's sponsorship of the report, *Embracing e-Learning in Australian Schools*, is part of its contribution to advancing Australia's future through support for education.

e-Learning will play a significant role in educating Australians of all ages in the future. The Bank is committed to helping the education community provide young Australians with the skills and resources they need to be effective e-learners.

The report does not seek to prescribe a right or wrong approach to e-learning in Australia, rather to prompt discussion, identify the changing nature and needs of learning in the twenty-first century and suggest ways students, teachers, parents and schools might best prepare for the digital age. The national and international case studies provide some real life examples of how schools are shifting to e-learning.

Ideally the report will become a frequently used reference as schools develop and implement their individual online learning strategies.

As part of its ongoing contribution to education, the Commonwealth Bank announced a number of initiatives in 2002 to help young Australians acquire financial life skills and to assist in the development of online learning. *Embracing e-Learning in Australian Schools* is one of these initiatives.

\* The opinions and conclusions expressed in the report are not necessarily those of the Commonwealth Bank.

Proudly sponsored by

**Commonwealth** Bank



## About the authors

### **Dr Dale Spender, AM**

BA DipEd MA Litt B PhD

Dale Spender is a teacher, lecturer, writer and performer who has a passion for the joys of learning in the digital age. She sees curiosity, critical thinking, problem solving and the creation of new ideas – and the learning associated with all of these activities – as a vital part of the human condition. But she also sees a need to create a sociable and stimulating environment in which the full potential of learning can be realised by all members of the community, throughout life.

She has taught in schools, colleges and universities around the world, has provided entertaining learning information (more than 30 books) in different languages, and she has advised governments, corporations, policy makers and educational professionals on the exciting opportunities for the new learning that the online medium provides.

She lives in Brisbane – in the smart state.

### **Dr Fiona Stewart**

BA GradDip PubPol PhD MPol and Law

Fiona Stewart is a leading industry analyst and adviser in the area of information technology and education futures. She has worked with some of Australia's largest companies and the Australian government in e-learning strategy, implementation and evaluation processes.

With postgraduate qualifications from Monash, Melbourne and La Trobe universities, she is co-author of one of the world's first books about online research (Internet Communication and Qualitative Research. Sage, London 2000). Fiona has consulted to both dot com businesses and the World Health Organisation in e-research.

She is 35 and lives in Melbourne.

# Contents

Executive Summary	8
Introduction	12
<b>Chapter One: Education for the 21st Century</b>	<b>14</b>
■ Background	15
■ Oral	15
■ Cave paintings and drawings	15
■ Writing	15
■ Print	16
■ Online	16
■ Print and online: Significant differences	16
■ Overview	17
■ Transformation	17
■ Demand	17
■ Teacher needs	18
■ Digital divide	18
■ Unlearning	19
■ Australia's position	19
■ Online status	21
■ Distance education	21
<b>Chapter Two: The Knowledge Economy</b>	<b>22</b>
<b>Chapter Three: The New Technologies</b>	<b>25</b>
■ Introduction	26
■ What are the new technologies?	26
■ Types of technology	26
<b>Chapter Four: The New Learning</b>	<b>27</b>
■ Learning as knowledge making	28
■ Standardisation	30
■ Comparison between the old and the new learning	30

<b>Chapter Five: The New Learner</b>	<b>31</b>
■ Learning + Technology = New Knowledge Economy	32
■ Learning in context	33
■ From independence to interdependence	33
■ Students as knowledge producers	34
■ Project based learning	34
■ Early years e-learning	34
<b>Chapter Six: The International Scene – e-Learning in the US</b>	<b>35</b>
■ Computers and the Internet in US schools	36
■ Digital divide	36
■ e-Learning content	36
■ Professional Development	36
■ Policy frameworks	36
■ eRate	36
■ National Educational Technology Plan	37
■ Schools of the present: Schools of the future	37
- Virtual high school	37
- Minnesota New Country School	37
- Teachers as consultants and professionals	38
- Edison schools	38
■ Conclusion	39
<b>Chapter Seven: The International Scene – e-Learning in the UK</b>	<b>40</b>
■ National Grid for Learning (NGfL)	41
■ NGfL Schools	41
■ NGfL Teacher Professional Development	42
■ NGfL Community	42
■ Community Grids for Learning: Dudley	42
■ NGfL Infrastructure	43
■ NGfL Quality and Content	43
■ NGfL Public and Private Partnerships	43
■ Other Programs	44
■ Beacon Schools	44
■ Conclusion	44

<b>Chapter Eight: e-learning in Australia</b>	<b>45</b>
■ Introduction	46
■ Commonwealth	46
■ States	46
■ Victoria	47
■ Western Australia	49
■ New South Wales	50
■ South Australia	52
■ Tasmania	54
■ Queensland	56
■ Australian Capital Territory	58
■ Northern Territory	60
<b>Chapter Nine: Australian case studies</b>	<b>62</b>
■ <b>Case Study 1: Methodist Ladies' College, Melbourne, VIC</b>	<b>64</b>
■ Getting a notebook	64
■ e-learning in the junior school	64
■ e-learning in the junior secondary school	64
■ e-learning in the senior school	64
■ myMLC.net Staff version	64
■ myMLC.net Student version	65
■ Digital Learning Objects	65
■ Subject homepages	66
■ Using the Internet to gather information in class time	66
■ Online discussion lists in class time	66
■ Information Technology Infrastructure	67
■ Smart cards	67
■ The Compass Centre	67
■ Professional Development	68
■ Pedagogical Issues	68

<b>Case Study 2: Woodcrest College, Springfield, QLD</b>	<b>69</b>
■ Curriculum	69
■ Organisational structures	71
■ Professional Development	73
■ Student life: 'We're in charge here!'	73
<b>Chapter Ten: e-Teachers Know How</b>	<b>75</b>
■ Introduction	76
■ The digital classroom	76
■ Digital content	77
■ The digital learner	78
■ Talk as the means of digital production	78
■ Learning and earning	78
■ Parents of the digital generation	79
■ Assessment	79
■ Futures	80
■ Behaviour	80
■ Skills	81
■ Unlearning	81
■ Learning and technology	81
■ Technology training and professional development	82
■ Effective professional development: Information technology approaches	82
■ The importance of time out	82
■ Theory and practice	83
■ Raising the profile of teaching	83
■ Convergence	83
<b>Overview: Trends for the next five years</b>	<b>85</b>
■ Introduction	86
■ Learning	86
■ Schools administration and governance	87
■ Teachers	87
■ Curriculum	87
■ School buildings	88
■ Public and private partnerships and community links	88
■ Schools' collaboration	88
■ Image of schools	89
■ Assessment methods	89
■ Conclusion	89

<b>References</b>	<b>90</b>
<b>Appendix I: Glossary of Technical Terms</b>	<b>97</b>
<b>Appendix II: International – National Grid for Learning</b>	<b>102</b>
<b>Appendix III: Case Studies of the use of new technologies in schools</b>	<b>107</b>
■ Case Study 1: World Wide Web	108
■ Case Study 2: School Websites	109
■ Case Study 3: Electronic Whiteboards	109
■ Case Study 4: Wireless	110
■ Case Study 5: Short Messaging Service (SMS)	110
■ Case Study 6: PC Tablets	111
■ Case Study 7: Electronic Roll Calls	111
■ Case Study 8: Portals	111
■ Case Study 9: Digital Libraries	112
■ Case Study 10: Webcasts	112
<b>Appendix IV: Online Learning Communities</b>	<b>113</b>
■ UK Communities	114
■ US Communities	114
■ Australian Communities	116

## Executive Summary

This report aims to provide teachers and schools with an overview of the shift to e-learning and the implications this has for the theory and practice of education. It should provide teachers with a useful resource for developing their own professional strategies in the digital environment.

**Chapter One** addresses the issue of the nature of online learning and the context in which it has arisen. It outlines the historical relationship between the information medium and the way that human beings 'take in' information and process it. In oral societies, where talk is the information medium, the community 'learns' via stories and memorisation. There are many voices and multiple versions. But this model changes with the advent of print where a record is provided. Record keeping in turn changes the way a community learns. For example because there is a record (a reference) there is less emphasis on memory and it is likely that one version – the authoritative one – emerges.

Now that new technologies have transformed the information medium, major changes are again underway. With the explosion in content the possibility of comprehensive memorisation becomes impossible. Digital literacy is about storing, finding, selecting, evaluating and using information to make something new. Because of its interactive capacity and because it provides a resource which can be changed and turned into new information, online learning is qualitatively different from the traditional model in education.

There has been an extraordinary increase in the demand for learning in the twenty-first century that extends far beyond the conventional student body to embrace life long learning for the community. Because learners are now more in control of their learning in the digital environment, they are making more demands for more content placing pressure on teachers and schools.

To cope with these revolutionary changes, teachers cannot just 'add on' increased responsibilities. Hard choices need to be made as to what responsibilities to keep and what to put aside. The capacity to unlearn the old is considered by online learning commentators to be as important as learning the new.

The emergence of online learning in schools across Australia is uneven with each state adopting different priorities. Some have been more enthusiastic than others, but there is now widespread agreement that online learning is the next generation of 'education product'. This means that students are increasingly online whether they are in a classroom, at home, or overseas. In this context it is clear that online learning is not to be confused with distance education for those who can't get access to 'the real thing'.

**Chapter Two** relates the emergence of online learning to the knowledge economy – and the huge demand of the population, throughout life, to keep up with the latest information and skills.

Developed societies now have to produce intellectual property in much the same way as they once produced soap, sofas and soybeans. This calls for a very different form of educational organisation and delivery. Not only is learning the raw material of the knowledge economy, but learners need to be encouraged to begin making knowledge products and making or 'doing' (the new term which is emerging) information, is a long way from memorising or knowing it.

**Chapter Three** covers the various types of new technologies and outlines their significance in educational terms. Appendix I provides a glossary of technical terms listing everything from the world wide web to digital repositories.

**Chapter Four** gets down to the nitty-gritty and sets out the need for knowledge making in a knowledge society. It analyses the traditional education system, particularly in relation to standardisation, and exposes some of the limitations in this model in the digital environment. An education system which has its origins in the 19th century and which, with modifications, has served society well throughout the industrial era, is not an appropriate model for the twenty-first century.

Where standardisation and conformity have been valued in the past (in keeping with the assembly line ethos) they do not form the best basis for fostering the creativity, intellectuality and sheer thinking outside the box which are considered to be the foundation for the new digital literacies. A checklist shows the features of the old and new learning.

The New Learner is the subject of **Chapter Five**. This is where some of the major shifts can be identified. Because e-learners are increasingly in charge of their own learning – making their selections and generating their own information – teachers have been cast in the role of adviser, facilitator or supporter. With the capacity to allow students to learn any time, any place and at any pace, (good) online learning is transforming the process of learning and the dynamics of the classroom.

This new independence of learners is balanced by the new desire and need for collaboration: peer to peer exchange of information and the making of new collaborative solutions (as distinct from doing your own work) is the hallmark of e-learning activity.

To accommodate these changes, and students becoming knowledge producers, the shift has been to project based learning. There are educational professionals who suggest (that as it was with books) the earlier children start with computers and online learning, the better.

The international scene is the focus of **Chapters Six and Seven**. Chapter Six begins with a brief overview of US initiatives. The US examples help to illustrate the changes that are now underway in relation to school organisation, professional development of teachers and the provision of resources. The 'virtual high school' can serve as a possible model, along with the Minnesota New County School. The Edison school model is also discussed. (Edison being a private company which is taking over the running of public schools). The reality of online classrooms is outlined, along with the emergence of teachers as learning professionals who list schools among their clients.

Chapter Seven discusses the UK example, the best illustration of a national e-learning strategy and an integrated online learning resource. The National Grid for Learning (NGfL) links industry, schools and community (along with BBC Knowledge, libraries, museums, universities etc). Attention is also focussed on quality and content. As with the US, the UK's pilot programs link public and private agencies in the governance of schools.

**Chapter Eight** covers some of the developments of e-learning in Australia and provides an indication of the different strategies that are being pursued by the different states. Policy, infrastructure, professional development for teachers and resources are the headings under which various state initiatives are addressed. While this coverage is by no means comprehensive, the very diversity of state policies provides a valuable resource and suggests possibilities for all.

**Chapter Nine** looks at two case studies of how e-learning is emerging in Australian schools. The Methodist Ladies College in Melbourne, Victoria – a private single-sex school – and Woodcrest College in Springfield, Queensland – a state co-ed school – provide the settings for a closer examination of the way schools are making the transition to online learning. While they have much in common, the two schools also provide very different models of e-learning for very different clients (their students). Together they help to illustrate the potential for e-learning that is available to teachers and schools.

**Chapter Ten** spells out the changes, challenges and professional rewards for teachers in the digital environment. From the characteristics of the digital classroom, to the crucial need for quality digital content to support teachers, this chapter centres on teacher know-how and how to get it. The nature of digital learning, the role of talk in the digital economy, along with the newly emerging relationship between learning and earning are examined and critiqued. The chapter sets out the extent to which teachers are now required to educate the community (including parents) on the role of new technologies, the changing nature of the school and its organisation, as well as the development of new forms of assessment.

The talents that teachers will need to develop, the skill base they will need to acquire and the question of how these will be provided raise interesting issues. The capacity to unlearn, to change, to become technological enthusiasts and the crucial importance of time out for teachers to allow the dust to settle, and the changes to be incorporated in their theory and practice are all addressed.

Then too there is the issue of convergence. With schools teaching VET subjects and school students enrolling in university courses, the boundaries between educational institutions are already blurring. Online the convergence may be even greater. Will it matter where the digital material originates? Will it be learning style rather than content which distinguishes the different institutions? What will this mean for the school and the public profile of the teacher in the twenty-first century?

Finally, there is a synthesis when all these changes are drawn together so that some sense of the pattern may be identified and the trends presented. Under such headings as learning, administration and governance, teachers, curriculum and school buildings, a summation is given on what is happening now and what might reasonably be anticipated in schools and education in the next few years.

The possibilities of public and private partnerships are entertained along with the image of schools and the potential for competition. The final focus is on assessment – how to assess change and achievement in an online environment.

Clearly this adds up to an educational revolution in which teachers are primary participants.

Along with the Glossary of Technical Terms (Appendix I), there are appendices on the international scene, on case studies of how the new technologies are being used in schools and online learning communities.

# Introduction

The new digital technologies have transformed the way we live and the way we work. They are now transforming the way we learn, along with our needs for learning. This is the reality of the information revolution.

There have been earlier communication revolutions – print being a primary example. But whereas it took centuries for the printing press to impact on living, working and learning, the current changes are taking place within a generation – even within a decade.

When change takes place so quickly, it happens very unevenly. While many communities have had old habits questioned and established traditions dislodged, they have responded in a variety of ways. Different initiatives have been embarked upon in different countries, and in Australia in different states, as government, business and educational agencies, respond to the demands of the new technologies.

Teachers and students are caught up in this turbulence.

Everywhere there is the demand for change, but with no precedents or models to serve as guidelines. How is this change to be accomplished? Every developed country – and every Australian state – is formulating their own e-learning strategies and solutions, but how do you know who is doing what and which initiatives show signs of being successful?

Where do teachers and schools fit into this? What does the educational revolution mean for the theory and practice of teaching and learning? What does it mean for the creation and delivery of curriculum and content? What does it mean for the organisation of the classroom and the governance of the school?

Then too there are the new skills.

It is readily acknowledged that today's school students need very different skill sets for the world of work, leisure and relationships in the twenty-first century. They need new attitudes to learning and new ways of learning. In recognition of this, some educational agencies are developing the 'new basics' and this in turn calls on teachers to acquire entirely new skill sets themselves.

But how and where?

In the digital world the luxury of time to reflect, research and review possibilities is not available. The demand for change is now. This doesn't mean that change should not be monitored, assessed, redesigned, etc, but it does mean that teachers are under enormous pressure to deliver immediately when their training has not always equipped them to make the transition to e-teacher.

Teachers need to know what's going on everywhere else. It is in this context that the e-learning report for teachers and schools has been prepared. It is a resource for educational professionals and brings together education and learning information in relation to the information revolution and the emergence of the knowledge society.

As a resource for teachers and schools, the report reveals the extent and impact of change and documents the ways in which different countries and states are dealing with it. It provides examples, possibilities and options for those who are making decisions about the transformation of schools to e-learning. With the benefit of these case studies, teachers and schools can evaluate, critique and make informed choices in relation to the models they might want to adopt for their school's unique environment.

The radical solutions that are being employed in school organisation and governance in the UK and the US (where private companies are running public schools) can form a database for reference and comparison for Australian schools, as they seek to restructure for the digital age.

Because the report synthesises the relevant material on the new learning, the new learner, and the e-teacher, educational professionals will be able to familiarise themselves with the range of new skills required for teachers, learners and teacher learners. They will also be able to evaluate the various professional development models that are emerging and use them as a basis for creating local and national educational possibilities.

Nowhere else has the 'data' on e-learning in schools been brought together, assessed, ordered and presented for educational professionals. While it provides an overview – and while the scene is constantly changing – it is intended to serve as a professional resource from which teachers and schools can draw in this fast moving digital age.

The report aims to meet the pressing needs of teachers to be 'in the know' and to develop the professional 'know-how' for the knowledge society.

chapter one  
education for the 21st century

The medium for teaching and learning is always associated with the prevailing information medium. So, when the information medium changes from oral to written, from print to screen or from text to visuals this will be reflected within the education system.

Currently we are in the process of change and this educational revolution will impact on every facet of teaching and learning. This transformation is not optional. Online or digital delivery is the next generation of educational products and services. It's because education in the twenty-first century will be so dramatically different that there is a pressing need to understand these changes and to develop teaching and learning practices and theories which will help teachers at all levels manage the transformation.

## **Background**

Teaching and learning – and what is appropriate educational content – have historically changed as communities have changed. The following is a brief overview of the tradition and the repertoire that today's educational practice has been built upon.

### **Oral**

- Before the advent of written records, the meanings and messages of the culture were transmitted from one generation to the next through the medium of stories.
- There would have been different versions of stories and they would have been 'modified' as they were handed down through the years. (The corroboree provides a valuable example.)
- The young learnt from listening and memorising the stories told by elders which they in turn passed on.

### **Cave paintings and drawings**

- Cave paintings would have been among the first notations that could serve as reminders.
- These illustrations were 'prompts' which could have provided reference points for the stories so that while there might still have been many versions, they may have had a specific focus.
- Learning would have been about listening and memorising, but with something to look at which served as an aid to memory.

### **Writing**

- With the invention of writing records could be kept and so learning was conducted partly by oral instruction – and partly by reference to the written record.
- Scholars of the Middle Ages studied the sacred manuscripts. They chanted out the words as they read communally. They even learnt much of 'the word' off-by-heart and those who made mistakes could be corrected, for there was a record that could be referred to.
- Because the written record was stable it stayed the same and endured. It was accorded higher status than the spoken word where 'any one could say anything' and where there were multiple and pluralist versions of events.
- These conventions shaped what people learned and the way they learned.

## Print

- Once the printing press was invented, it was suddenly possible to produce an infinite number of completely accurate charts and graphs etc.
- Then because accurate copies of graphs and tables could be printed, mathematics took off. Exploration became easier and safer too because accurate maps and charts could be printed in significant numbers. Print also helped to foster the emergence of the scientific revolution and international trade. Conditions were created for the industrial revolution, which changed the way people worked and lived.
- As books became more freely available and public libraries and schools were established, most members of industrial societies learnt to read. They were empowered by their increased and independent access to information, which is associated with the rise of democracies.
- Print is also a broadcast medium where one authority 'broadcasts' to the mass audience. (Conventional film and television also fit into this category.)
- Books or texts became the primary medium for information. Learning has been closely associated with studying the text, with taking in information from the source and reproducing it – generally in written form.
- Print helped to change the basis of society, the nature of work and how individuals thought about themselves and the world. It transformed the way human beings learned and 'processed information'.

## Online

- Now the information medium of developed societies is increasingly online and builds on all the preceding communication repertoires.
- Online has the element of talk (chat is extremely popular, as is SMS through mobile phones); more and more video-conferencing is also being used. Online there is everything from informal text (which can be emails) to formal text (research reports and databases).
- But online has the extra dimension of images, sound, movement etc. This makes it a very rich information medium, not simply because of the multimedia capacity, but because it is interactive.

## Print and online: Significant differences

Interactivity is the most significant difference between print and online delivery of information.

Whereas print was stable and stayed the same no matter how many people read the text from one generation to the next, the digital medium is one which can be constantly changed. In this sense it can be customised or individualised. It isn't a broadcast medium where one size fits all, but a resource that can accommodate the needs of individuals in respect to any place, any pace, any time.

- Print is **read**. Online information is **used**.
- Online delivery allows users to do things with the information – to cut, paste, change, add, edit, re-combine – and make something new.

- Online facilitates 'know-how'.
- Whereas **print is one way, online is two way**. Users can take information out, but they can also put it in. This makes online much more like conversation where many can contribute.
- That is why we have the saying 'anyone can say anything on the Internet' and as in any conversation, the information on the Internet always needs 'checking out'.

## Overview

The concept of authority – the one expert voice associated with print – has not transferred to the online medium. Online learning is not so much about taking in existing information, but connecting and creating new resources, actively assembling information and engaging in problem solving. This information in turn can be 'checked out' by others.

This is why e-learning or online delivery (or digital object repositories which contain all the learning materials) constitute the appropriate medium for the knowledge age.

e-learning is a product of the new technologies (just as books were the product of an older technology). It doesn't require our approval as an educational medium any more than books did in the past.

## Transformation

No doubt the next generation will take e-learning for granted, just as older generations have taken books for granted. Already the net generation (under fifteens) are so computer competent (digitally savvy) that in general, they are more proficient with the medium than most of their teachers. This poses something of a problem for professional educators who must manage the extraordinary transformation from print to digital.

## Demand

The new communication technologies (including computers, mobile phones, etc) and all the messages they generate have meant a massive increase in the amount of information produced. Unlike print where the message was always the same, digital information is always changing.

### *Changes in Demand*

- Constant change: web pages you looked up last week aren't there any more and you may never find them again or else there's an upgraded version of the online material that doesn't contain the information you are seeking. Even the software you use to organise your own information keeps changing. There is a much greater amount of information and it is in a state of perpetual turnover.
- Keeping up: there's no other way for learning and education to 'keep up' with this turnover in information, except via the new technologies and online delivery. Where else can learning materials be changed, upgraded every day or as often as upgrades are needed? Where else can this be done as cheaply? (Digital copying is not only close to perfect, it is cheap and easy.)

- More people want more learning: the demand for new information and for learning hasn't just been increased because more information is being produced more often. It is also that more people want it.
- Life long learning: whereas there was once a particular 'student body' which generally covered the ages from about five to twenty five, we now have most of the population requiring some form of life long learning. Everything from cultural change information to skills upgrades.
- Student use: in classrooms where online students can use the information and where they can be in charge and go at their own pace, their use of content is so much greater than the old system where teachers dispensed the 'one size fits all' flow of information (and where there was no advantage for those who could learn quickly). This means that one of the greatest difficulties for teachers is that the content demand can be so voracious. What might once have been covered in a semester is now used in a matter of hours. So how do today's teachers meet this demand for educational content?

### **Teacher needs**

No one teacher or school can solve some of the problems that arise from this educational upheaval.

Teachers are not rich digital content specialists and should not be expected to be so. Within the print system, teachers did not have to write their own textbooks. A wide variety of professional materials have been available for them to use as resources for their individual lessons – and now the same quality of resources should be available digitally. This will require more collaborative and even national strategies.

### **Digital divide**

We cannot have an educational system that is available only to the few.

Just as in the nineteenth century, it was agreed that everyone should have access to books but not everyone could afford them, so the imaginative solution of the public library was formulated. So now we need imaginative solutions to ensure that everyone has access to online delivery of learning – anywhere, anytime and any pace.

- Information technology (IT) infrastructure is basic for a knowledge economy and e-learning, though IT in itself is only the starting point.
- IT is only the enabler, just as the printing press was for books, and it is no more sufficient to eliminate the digital divide than was the presence of books to eliminate illiteracy.
- Learning and cultural change are necessary for literacy and computer competency.
- Just as access to books was no guarantee that people would learn to read and write, so access to the Internet is no guarantee that people will become computer competent. There are many mature members of the population who have access, but who are 'scared' or antagonistic to becoming computer competent. In these circumstances the need is to change mindsets rather than to simply promote keyboard skills.

- There is mounting evidence that learning to use a computer is much easier than learning to read or write. This is partly because it is interactive and provides its own feedback. Very young children can 'teach themselves' to use a computer, whereas someone had to teach the alphabet to those who were learning to read and write.
- Because of the interactivity, learning computer competency is not about keyboard skills and has little in common with simply 'typing'.
- This makes the teaching of computer competency very different from teaching the old basics.
- A new basics of information management is emerging as the framework for education in the twenty-first century and all students should have access.

In a print-based society those who couldn't read or write were denied full participation as citizens. They were outside the community loop unable to hold a driver's license, to read official forms or contribute in many forums. The same will soon be said of those who are not computer competent. They will not be part of the information society.

## Unlearning

Some of the e-learning professionals suggest that the biggest obstacle to taking on the new learning is that of unlearning the old. This applies to educational professionals as well.

## Australia's position

There is widespread consensus in educational circles that Australia is not keeping pace with its OECD peers or keeping up with its competitors, and that much more needs to be done to ensure that Australia meets the challenge of the educational revolution. More money and new models are called for so that education can restructure and become the powerhouse of the knowledge economy.

It is recognised that more people need more learning and that the school leaving age trends for example, are worrying:

*'Year 12 retention rates have declined from 77.1 per cent in 1992 to just 72.3 per cent in 2000. The rate is lower for males, fewer than 7 in 10 of whom now complete Year 12. These are disturbing trends, and if not reversed, raise real questions about Australia's capacity to develop a strong, knowledge based economy' (Schubert, 2001).*

That a 'good' education system is fundamental to a knowledge economy, is a case made by academics, business leaders and media barons, with Rupert Murdoch being among the most recent to urge Australia to improve its economic position by improving its education provision. The key to the future of any country in the twenty-first century he says is,

*'...not it's physical resources or industrial capital; rather it is human capital that will fund the health and growth of nations in the next thousand years...' (Murdoch, 2001).*

He goes on to say that the brains, skills and entrepreneurial spirit of its citizens are a country's most precious and powerful asset. He continues that we have to start rethinking the way we value our assets and grow and maintain them. In the past we have been fooled into thinking that the industries and technologies have been more valuable than the people who run them, yet all our real estate, bonds, natural resources, pension fund reserves, cash deposits, etc. comprise less than 30 per cent of the national balance sheet.

*'70 per cent of the real value of any society lies in its human capital.'* (Murdoch, 2001).

Human capital is only as effective as the learning that activates and supports it. Which is why Rupert Murdoch urges Australia to invest more in its education system. An education system that is in keeping with the demands of the digital age may even be of more interest to today's digital generation. (People may stay on longer at school and become more learning oriented if the educational content is more digital and meaningful.)

#### *Summary*

- Currently, Australia does not have a national strategy for the implementation of the transformation to e-learning in schools. From the national statement of aims, each state has formulated its own implementation policy and each has different priorities. There are differences between states, between the public and private sectors and within the public and private sectors within each state.
- There has been no national advisory board on e-learning for schools – hence no national initiatives such as the National Grid for Learning (NGfL) in the UK. Nor are there any national goals and objectives for the adoption of e-learning throughout the school sector.
- It is internationally agreed that one of the greatest challenges which faces the introduction of e-learning delivery throughout schools is the provision of professional development for teachers. Although each state in Australia has addressed the issue of professional development, the position in Australia is one where delivery is uneven and there has been no systematic attempt to establish professional development delivery across states. Though it is clear that the professional development packages for the new learning would readily lend themselves to national online delivery, there are problems associated with trying to find educational professionals with the desired skills to contribute towards professional development and teacher training.
- The absence of a national strategy means that currently each state 'starts from scratch' and there is much 'reinvention of the wheel'. On an international scale, Australia has a very small population and local or state systems cannot compete with information multinationals in the creation of online content. With no national policy to bring all the education systems together (school, college and university as well as the various states), it is easy for each 'player' to regard all others as competitors when the real competition is Disney, News Limited or AOL.

What might also be taken into account is the possibility that a national online agency – which could deliver the best online learning that Australia could create – would have a significant global market, delivering online materials to schools all over the world.

## **Online status**

New technologies generally start off by making use of some of the old practices – for example, the first movies were stage plays that were filmed. Likewise, the first online education materials were generally some of the old print forms which were simply migrated to the web.

It is not unusual, for example, for some academics to claim that because they have put their lecture notes on a web page, they have delivered education online. But there are quite a few problems with this claim.

Firstly, the screen is not intended for the stable and linear medium of print and most users, for different reasons and dependent on age, don't read text on screen. If they do want to 'read' the text they print it out which is back to the old technology. The only difference being that the user is paying for the printed version of the lecture notes.

Much of the current e-learning material is still the old-technology-transfer, rather than transformation to the new technology.

At the beginning of the twenty-first century only the very first steps have been taken in the development of online learning. The medium is still at the 'silent movie' stage so it is not often that fantastically good online materials, which make full use of the medium, can be cited.

But the absence of plentiful, fantastically good material is not an argument against online delivery. It is an argument for putting more resources into online delivery so we can do it better.

There is no reason that Australia should not have a world class reputation in this area, after all the nation did enjoy world class status with 'School of the Air'. School of the Air had widespread international interest and approval as an excellent means for delivering distance education.

## **Distance education**

Some educational professionals have persisted with the notion that online delivery is distance education. Yet this is clearly not the case. Online means that the learning is associated with a person – not a place. This is why it is often referred to as 'customised' because the learning can be tailored for the person and accessed at any time and any place in a form that is desired, for as long as it is required. The learners may be in a classroom, at home, in an internet café or a library in Australia or overseas! As long as they have an internet connection, geography is not a variable.

Distance education can also be used to suggest that online is somehow second best – for those who can't get to or can't afford the real thing. Yet in the twenty-first century e-learning is the real thing!

chapter two  
the knowledge economy

**Question:**

How many workers do you know who make something you can drop on your foot?

**Answer:**

Very few!

This means that Australia is producing, selling and trading in skills and services and that the success of the Australian economy depends upon the human capital of the population. The ability of the nation to use this creativity and intellectuality as a resource, for making knowledge products.

Charles Leadbeater, an adviser on the new economy to the UK Prime Minister Tony Blair, describes this transformation from the old manufacturing to the new knowledge economy in the following terms:

*'Most of us make our money from thin air; we produce nothing that can be weighed, touched or easily measured. Our output is not stockpiled at harbours, stored in warehouses, or shipped in railway cars. Most of us earn our livings providing services, judgement, information, and analysis whether in a telephone call centre, a lawyer's office, a government department or a scientific laboratory...'*

*(Leadbeater, 1999)*

In the industrial era, economic success (balance of payments etc) was often measured by weight. But weight is not a good measuring stick for information and intellectual property. For example, until the late 1980s the number of computers being imported into the UK was based on weight, a most inaccurate measurement as Charles Leadbeater indicates:

*'The laptop I am using to write this book weighs less than the laptop I bought five years ago. Both machines have broadly the same ingredients – plastic, copper, gold, silicon and a variety of other metals. Yet the new machine is ten times more powerful, far faster and more adaptable than the old machine. None of this extra power is due to new materials, but to human intelligence that has allowed its makers to reorganise the available materials in minutely different ways.'*

*(Leadbeater, 1999)*

This is what a knowledge economy is all about. It's where knowledge products are made and sold. Schools need a very different knowledge base if they are to prepare young people to make knowledge products, rather than goods.

Making knowledge products is about know-how: Charles Leadbeater provides another analogy, that of recipes.

**Recipes and know-how**

It's all about recipes. How to use some of the same old ingredients in new ways to get an improved product. The value is not in the ingredients, but in the recipe – the know-how which is the intellectual property.

Take a cake for example. Those who bake the cake can sell it only once and when it is eaten it is gone!

But those who make the recipes (the know how) can sell the cake again and again. Some recipes can even become more valuable when handed down from one generation to the next.

The recipe for the cake isn't altered by age or use. Unlike the cake, the recipe doesn't go 'off' after a short period – though it can become passé and need to be upgraded and added to. As the sales of the recipe aren't limited to one individual it doesn't cease to earn money for the maker after one sale.

So it's the knowledge makers who do well. The intellectual property of the cookbook writers can be used and sold repeatedly for as long as there are other cooks who want to follow the recipe. This is why cook book authors, or recipe makers, are on the best seller list (*Leadbeater, 1999*).

So, countries where the population can make knowledge (recipes) rather than goods (cakes) can become traders in the knowledge economy. Because they are creating know-how, their knowledge products often need only to be made once and then they can be used almost infinitely – like Microsoft Windows.

It's precisely because we are making knowledge products that we need to rely so heavily on learning – on accessing, using, changing and rethinking information – so that we can come up with a good idea and turn it into an entity – even a commercial knowledge product. This is why learning and earning now go together.

chapter three  
the new technologies

## **Introduction**

In order to assist today's teachers to make sense of the new technologies, this section outlines how technology is being used by teachers in schools around the world.

Appendix I provides a glossary of technical terms and uses for new technologies along with a range of case studies which cover real life examples and show the infinite possibilities.

## **What are the new technologies?**

Traditionally 'educational technologies' have referred to 'resources, such as methods, tools, or processes that are used for handling any activities involved in education' (Pea and Cuban, 1998). This definition implies that teachers, books, physical materials like alphabet blocks, blackboards, overhead projectors and even science laboratories can all be classified as types of technologies.

Since personal computing came on the scene in the early 1980s, technology usually refers to the Internet, including the world wide web (www), email, discussion lists, real time chat and even ICQ messaging. Of course, other technologies such as CD Roms are also included in discussions about new technology.

## **Types of technology**

According to the US web-based Education Commission (2000), while technologies may differ in format, their aims are common. They include:

- more interaction among students or with the instructor;
- the encouragement of more out-of-class student reflection; and
- the ability to provide synchronous and asynchronous delivery to deliver learning directly or to 'store' it so that learners can access it when required.

The same Commission notes that today's students increasingly expect that their school courses will be integrated with online materials or discussions. Indeed, according to one recent Harvard University study, undergraduate students now spend more time on the Internet each day than they spend sleeping or attending class (Robinson, 2001). For further detail refer Appendix I: Glossary of Technical Terms.

chapter four  
the new learning

From the new technologies and the knowledge economy there emerges a new way of learning. It's not a discrete or isolated activity any more, not necessarily something you go off to a specific place to do for a certain time. It's not always delivered in real time by one expert in a one-size-fits-all form either. Rather, it can always be with you, wherever you are connected.

So learners are a bit like learning shoppers, browsing through the digital repositories or content supermarkets, looking for the products they want which meet their knowledge making purposes.

The new learning is:

- self directed;
- not scheduled, but is throughout life;
- not regimented, or based on the assembly line model;
- online; and
- just like work it is always with you, you can take it wherever you go.

### **Learning as knowledge making**

The education system of the past century has been based more on knowledge receiving. This is associated with the nature of the information medium.

- Print is a one-way medium, from author to readers.
- Only a very few can be knowledge makers or authors in a print culture, which is why it is referred to as a broadcast medium, where one 'voice' speaks to many.

These features have shaped the education system. It has been logical to have a classroom, with ordered desks and a platform, with one teacher out the front providing the information for the many who are the knowledge receivers.

The learning that has taken place within this system has been primarily that of **knowledge transfer**.

The education system has focussed on resourcing teachers. Making teachers the content experts who know their subjects. The premise has been that teachers can then 'transfer' this content to the students who, along with the assistance of other broadcast media (textbooks, notes, lectures, videos, tv, etc), can study and memorise the content and be required to recall or reproduce it, in tests, assignments or examination circumstances.

This can be referred to as a closed circuit system. It is one in which many of the answers are already known and where the students are required to take in the information, study the content and then reproduce the right answers to pass the test.

Having a system based on 'correct' answers, on being right or wrong, or even of passing and failing, can be the result of a one-to-many information medium. If there's only one authority, one voice (as there may be in the one way information flow of the broadcast medium) then those who don't take it in, who don't learn or know it, can be regarded as having got it wrong.

Clearly, this has the potential to be a very conformist system of education and conformism is one of the least desirable attributes in a knowledge economy, where a premium is paid for what is NOT known, rather than for what is already known.

So if the knowledge transfer model is a pattern which has been associated with print, it is one which is radically transformed once the digital medium becomes the educational norm. For the new technologies are not a one way medium and this has significant repercussions.

- Digital is a two way medium: an individual can both take in information with the new technologies and create information; new technologies are not read or received, they are used and 'repurposed'.
- As all digitally connected individuals can make information, there are multiple voices, rather than one voice, so there is no one right answer but many possibilities.

The interactivity and the reality that 'anyone can say anything on the Internet', just as anyone can say anything in conversation, means that the medium generates a very different form of learning in the knowledge society.

The new technologies shape the new learning and in turn will shape the new education system.

- The focus shifts from content to competency.
- From what is known (or memorised) to what use you can make of the information.
- The emphasis moves from what teachers can teach to what learners can learn.
- Learners become doers that can evaluate, check, select and connect digital information to make something new of it (and preferably something that can become a commercial knowledge product).

The assembly line model of the past characterised by its ordered progress through years and grades, a regimented timetable, a highly structured curriculum and learning a scheduled activity for certain periods at specific times of the year, gives way to a learner based model characterised by just in time, just for the individual and just for as long as is needed.

The one-size-fits-all medium – whereby students were all subjected to the same educational event for the same amount of time, at the same pace, without reference to need, interest, ability, intent or learning style – can be replaced by a customised model. A model that allows individuals to select and make knowledge which is of interest and value to them – and others.

Too often, those who learned quickly were penalised by the old system. They were either given 'more work' or had nothing to do and those who learned slowly could fall even further behind. Because we now want to develop the intellectual and creative resources of everyone to their full potential, throughout life, we need the customising capacity of the online medium.

## Standardisation

Rather than customised, the education system has been highly standardised in relation to:

- the standardised curriculum;
- for a standardised time;
- in standardised schools;
- in standardised form (Grade I, II, III etc);
- with standardised delivery; and
- subjected to standardised tests.

Yet it is not standardisation the knowledge economy needs – it is precisely the opposite. The building blocks of the knowledge economy are creativity, intellectuality and the ability to think outside the box!

Sometimes standardisation is confused and conflated with the concept of quality. This is another feature that must be questioned. For we desperately need quality, but in the digital environment.

## Comparison between the old and new learning

*From knowledge transfer to knowledge making...*

Education as a qualification	Learning as a lifestyle
Knowledge as the basis for organisation	Student need and interest
Knowing content (doesn't last)	Doing knowledge making
Testing (memory)	Simulation (online). Can you do it?
Teacher as expert and in charge	Student as selector, user and in charge
What is known	What is unknown
Regimentation, conformity, Orthodoxy, standardised	Menu of resources: digital learning, objects which are the raw materials of knowledge making
One to many: broadcast medium (vertical)	One to one: peer-to-peer (horizontal)
Follow someone else's argument	Create your own
Competitive	Collaborative
Deconstruct, analyse, take apart	Constructive, synthesise, connect. Make new models
Scheduled event	Integrated
Just in case	Just in time: need to know basis, pay for it as long as you use it
Chore/study	Fun – edutainment

*With the new technologies... you don't have to study in order to learn*

chapter five  
the new learner

It is often said that the Internet changes everything. While for some industries, this assertion may be a gross exaggeration, in educational terms, it has a good deal of credence. This is because the new technologies are no mere add-on to traditional ways of teaching and learning.

This section examines the fundamental shift that is currently occurring in K-12 education around the world and the relevance of such a shift to the new knowledge economy.

### **Learning + Technology = New Knowledge Economy**

- The new learner is self-directed. Learners are users and they need to be responsible for their own learning and to select what they use.
- The teachers are there to resource and facilitate, but more as a guide on the side rather than the sage on the stage.
- There are no 'right' answers like there used to be, rather students (learners) have to experiment, explore and think differently to come up with a solution to a problem – to create new knowledge.
- There is more pressure to think, learn, find what works, be critical, evaluative and a decision maker.
- This doesn't have to be an individual activity. Two or more heads are usually better than one when it comes to problem solving and working out solutions.
- It's not about memorising or storing information, but about finding it, trying it out and making something new with it.
- It won't necessarily be presented in print format. There is a new multimedia focus online so that you should be able to convey your information more and more in visuals, graphics, audio, video, etc. This means students need to know more about various authoring tools. Just being able to retrieve information will not be enough. Making something with it is what it is all about.
- It also means users and makers start to think differently about information and presentation. It's not a linear process any more.
- This doesn't mean it's just about competence with word processing or spread sheets. It means students have to develop critical and conceptual agility.

The new technologies are providing new ways for organising and creating information. This should be reflected in the work patterns of learners who need to develop flexibility, adaptive interdependence and to restructure their organisational design of learning in the following areas:

- managing homework: particularly since online gives a whole new meaning to working at home or outside the classroom;
- designing homework: which takes on new forms when the challenge is to come up with a new knowledge product rather than to reproduce what is already known;

- co-creating assessments: because so much knowledge work is done in collaboration and with the stimulation and contribution of others; and
- continuously extending collaborative work around the globe.

For teachers, these new developments represent huge challenges and the related requirements for professional development are almost incomprehensible.

For further discussion of the new forms that technology takes in the classroom, see Appendix III: Case studies of the use of new technologies in schools.

### **Learning in context**

A further development that has been brought about by e-learning is the notion of 'any place'. e-learners are freed from undertaking learning in the structured and formal environment of the classroom. Already visitors to Australian schools can find students accessing the Internet or conducting online discussion or chat from outside of school buildings or in school tuckshops.

The learning is where the student is, not where the bricks and mortar are (although e-learning can be undertaken there too, as in any other location). This form of mobility has important implications for out-of-school learning, even in relation to the learning undertaken on fieldtrips. In turn, this freedom of movement may also serve to blur the boundaries between learning, work and recreation. In today's connected world, learning is always with us.

For young people, this lack of distinction can be an advantage because it creates and reinforces the expectation that learning is everywhere all the time, instead of something that is only undertaken in serried rows, at a desk in a school classroom.

### **From independence to interdependence**

While peer collaboration has always been a prominent feature of school-based learning, until now it has been dependent upon geographic location and classroom membership.

With e-learning however, students are able to form entirely new networks for working together and it does not matter that these students may not share the same classroom, the same school or even the same country.

The skills that the e-learner stands to acquire through such collaboration are many and varied. Flexibility, innovation, brokering and responsiveness are precisely the competencies demanded for inclusive membership in a knowledge society.

Even within the same classroom, e-learning creates new opportunities and expectations of the learner.

For quiet or less confident students the less formal online environment can be more inviting than the formality of the classroom. There is also the fact that in e-learning, everyone has an opportunity to participate. There is no need for hands to be raised for questions to be asked or contributions to be made. Teachers can monitor fair and equal tuition, rather than being required to respond to behavioural demands in the classroom, where in the interest of 'discipline' the most disruptive can gain the most attention.

The ability to learn at one's own pace can be very beneficial for students, although for teachers it creates a demand for extraordinarily diverse and extensive content which cannot be met within existing frameworks.

### **Students as knowledge producers**

One of the most important of all changes that has been brought about by e-learning, must be the fundamental shift from a focus upon what is known to what is not known. In becoming knowledge producers students have entered new territory – territory that is integral, if not a prerequisite, for a life of knowledge-based work.

According to Dr Thomas Brock, Principal of Los Angeles' Whitney High School (2001), technology and the Internet have become 'essential tools in K-12 education' to the point where his students serve as 'curriculum manufacturers' using streaming video technology to provide resources to the district's elementary schools, middle schools and other high schools.

Brock explains the shift to knowledge production in the following way; 'These kids are incredibly bright and if you give them the tools, they just take off with them. They teach us things. Technology is helping us move from being fountains of information and knowledge to being collaborative workers with students. We are becoming learners around learners.'

### **Project based learning**

Recent surveys have found project-based learning to be one of the most enjoyable means of learning. Indeed, project-based learning is an approach which parents have been found to agree is an extremely effective way for their child to learn (Moyer, 2001).

One of the most important features of project-based learning is the change from knowing to doing. No longer do teachers and students just learn or use digital content. More and more often they make it as well.

'New digital, computational-based tools' not only enable students and teachers to grapple with content in a way they simply could not do before, but they shift 'content from a series of static words and video that were given to them by someone else to something that is altogether new' (Trotter, 1999).

### **Early years e-learning**

In most people's mindsets, e-learning is something that has little relevance to very young students. On the contrary however, in the experience of schools such as MLC in Melbourne, there is a variety of ways in which K-3 learners can be introduced to e-learning and the full range of new technologies. (Just as young people were once introduced to books, the earlier the better!)

In Britain, there is currently a similar trend towards introducing technologies to students of all ages. The Borough of Lewisham in London has developed a range of possible activities for the very young and it is certainly the case now that many preschoolers are already relatively competent with the new technologies – even before they enter a school.

chapter six

the international scene  
e-learning in the US

'First, stop thinking of the classroom as the only learning space. Second, remember that we are building a community, where the classroom is just one node of a complex learning environment. Finally, accept young people as a vibrant, fully participating part of the intellectual capital of a community. Then, and only then, will we realise the full potential of what technology will enable.'

*(Carroll, 2001)*

This section examines what is happening in the United States in school-based e-learning from a Federal policy to community program level.

## **Computers and the Internet in US schools**

As the home of the Internet, the US has made Internet access in schools a priority with 98 per cent of the country's 100,000 schools connected to the Internet. This compares to only 35 per cent in 1994.

### **Digital divide**

There is a significant digital divide in the US between the digital 'haves' and the 'have nots'. Not only do only 10 per cent of teachers have five or more computers in their classrooms, but 'disadvantaged' schools are more likely to emphasise word processing and other simple tasks. Schools in affluent areas are more likely to use technology conceptually and to focus upon problem-solving and deeper understandings which are more marketable and better paid skills in the outside world *(Carroll, 2001)*.

### **e-Learning content**

Already in the US, 13 per cent of K to 12 public schools subscribe to some form of online curriculum (Market Data Retrieval, 1999). It is estimated that over 30,000 of the country's 16 million high school students have already taken an online course *(Ball, 2001)*.

### **Professional development**

In the US, as in Australia, the advent of e-learning has been a major challenge. The same Market Data Retrieval (1999) research reveals that while almost half of all teachers have spent more than eight hours in technology professional development, only one third of public school teachers say that they feel 'very well' or 'well prepared' to use computers and the Internet in the classroom.

### **Policy frameworks**

To date, the US has focused largely upon putting infrastructure in schools and upon stronger school and community links. These policies have contributed towards these goals.

### **eRate**

Established in 1996 under the Clinton Administration, the eRate program provides discounts to schools, libraries and community groups on telecommunications services, Internet access and internal networking. In the first two years the program connected 3,000 school districts, 70,000 public schools, 5,000 private schools and 4,500 library systems (Puma et al., 2000).

The eRate program has increased demand for the Internet – particularly in disadvantaged areas – and promoted community partnerships between businesses, community colleges, local museums and senior citizen centres.

### **National Educational Technology Plan**

The Clinton NET Plan spanned the years 1993 to 2000 and was a driving force in the integration of technology into learning in schools. This national policy focused on providing students and teachers with IT access at school and home, assisting teachers in use of technology, raising IT literacy skills, developing digital content and looking forward to improve the next generation of technology for teaching and learning. All these are equally relevant to Australian education.

### **Schools of the present: Schools of the future**

#### **Virtual High School ([www.flvs.net/](http://www.flvs.net/))**

The Virtual High School was the first 'school' to specialise in the development and delivery of e-learning thereby increasing the number of faculty and students who have a high degree of technological skills.

As a non-profit network of 200 high schools in 13 countries, each school offers a different NetCourse each semester. There are currently 126 courses on offer for which participating schools pay an annual membership fee with teachers paying fees for the two e-learning PD courses available.

#### **Minnesota New Country School ([www.mncs.k12.mn.us](http://www.mncs.k12.mn.us))**

The Minnesota New Country School (MNCS) is a non-profit public charter school (refer Appendix I: Glossary of Technical Terms). Established in 1994, MNCS enrolls approximately 130 students in Years 7 – 12, many of whom are disadvantaged and some who have learning disabilities.

As one of a new breed of charter schools, MNCS has strong links to community businesses, parents and the broader local community 'where learning is linked to the real world through work experience, apprenticeships and entrepreneurial activity'.

As a school and learning community, MNCS incorporates the following principles: extensive involvement from parents, strong teacher – student accountability, technology as a tool for learning and community as a place to learn.

Departing from the traditional school at every turn, at this school there are no classes, bells or teachers employed.

- No Classes: There are no classes because the school operates using five – seven week project-based learning blocks, followed by one week off for teacher planning. Students must complete 10 projects per year to fulfil state standards.
- No Bells: There are no bells because learning is continuous and managed by the students themselves. The curriculum and the learning of different subject areas are implicit to the projects

undertaken by the students with multi-aged, non-graded and self-paced learning and each student following a customised program that is devised in consultation with teachers and parents.

'MNCS is a truly computer infused secondary school,' Head teacher Doug Thomas said.

'When the rote learning, factory model is abandoned in favour of a student-centred, problem-solving approach, the computer becomes the perfect tool. Technology at the school is therefore invisible. It permeates each student's day just like pencils used to a hundred years ago. Students don't think twice about using it,' Mr Thomas said.

Students don't simply use technology for word processing or spreadsheets either. At MNCS, students use the technology for email, the web for research, but also CAD for drawing and Powerpoint for presentations.

One student describes his work in this way, 'Right now I'm working on a 3D animation project – it's an airplane movie. I have to use geometry and art and I'm learning about shapes and colours.'

### **Teachers as consultants and professionals**

Teachers are not employed in schools on a permanent basis, rather MNCS contracts with a professional educational collective known as EdVisions ([www.edvisions.com](http://www.edvisions.com)) that describe themselves as 'a professional partnership of educational entrepreneurs' (Corson, 1998).

This model is important because it signifies a dramatically new way for teachers to teach. Not as employees of a school. But with the school as their client. So that teachers are becoming portfolio workers in keeping with the evolving practices of the knowledge economy.

A further unique aspect about MNCS is its commitment to its local community and the world outside. In this respect, the school places a high priority upon community service, school-business partnerships, apprenticeships and student businesses and entrepreneurship.

From a professional development perspective, one of the guiding principles of the school is that 'administrative and budget targets should include substantial time for collective planning by advisers'. Not to mention the payment of competitive salaries for staff.

### **Edison schools ([www.edisonschools.com](http://www.edisonschools.com))**

At the other end of the charter school spectrum from the Minnesota School is the NASDAQ-listed, for-profit education company, Edison Schools. In all its schools, Edison gives every student a computer in third grade. Take the Roosevelt-Edison Charter School in Colorado Springs for example.

In 1997, the school put computers in the homes of nearly all its 650 students (except a few who declined) and wired them to an Intranet run by Edison Schools. This move allowed teachers to post homework and messages and allowed parents to debate issues such as school uniforms. While this type of networked housing estate is largely unfamiliar in the Australian context, the experience of schools such as Woodcrest College in Brisbane is changing this.

## Conclusion

As the home of the Internet, it is not surprising that in the US education system the Internet has become a popular and indispensable part of learning in schools – and in the community more broadly. For Australia, the lessons that can be gleaned from the US experience cover several different areas.

- The deregulated US environment and the advent of charter schools has led to a good deal of flexibility in how schools can operate. This has implications for how Australian schools can fulfil curriculum requirements while, at the same time engage in the transformation of learning so that students are prepared for the demands of the knowledge economy.
- The lack of regulation of teaching in the US has been cited as one of the reasons there is so much innovation. The example of Minnesota New Country School shows that teachers can benefit from a less bureaucratic and less regulated industrial relations environment and can take up more flexible portfolio and knowledge worker careers. There is also the suggestion that a centrally administered education system is not always the most effective structure, although there is clearly a need for national policy and projects.
- As the US has found, it is not enough to connect schools to the Internet. The provision of effective and innovative professional development for teachers – often with time release from teaching – is the most effective way of ensuring that technology-infused learning (e-learning) benefits all involved.

chapter seven

# the international scene e-learning in the UK

*By 2002, all schools will be connected to the superhighway, free of charge. Half a million teachers will be trained. And our children will be leaving school IT-literate, having been able to exploit the best that technology can offer.'*

*Tony Blair, UK Prime Minister (Foreword in Connecting the Learning Society, 1997)*

When Tony Blair's government was elected in 1996, education in Britain began to experience a renaissance and is now abuzz with excitement. Already \$A3.6 billion has been spent on schools and learning-related Information and Communication Technologies (ICT).

### **National Grid for Learning (NGfL)**

The National Grid for Learning (NGfL) is the most important education policy of the Blair Labour government. Aimed at integrating learning into the 'fabric of British society', the Grid connects schools, colleges, universities, public libraries and community centres. In the near future, it will also link to the UK's Public Library Network and the community learning initiative Learn Direct ([www.learndirect.co.uk](http://www.learndirect.co.uk)). There is no comparable national government commitment to the use of technology in Australian schools.

The NGfL currently operates as a regional program with individual or clusters of local government and Local Education Areas (LEAs) (refer Appendix I: Glossary of Technical Terms) working together. One evaluation of the Grid has found that primary school children are just as likely to know how to use software applications as they are to know how to use information 'intelligently'. In education terms, this means that ICT is not only about knowing how to use the technology, but how to use it to do new things and in the process create new knowledge for students to become knowledge producers.

The NGfL is part of a broad ideological shift on the part of the Blair Labour government. While maintaining its traditional commitment to equity and excellence for all, this government is seeking to transform education, while influencing the nature of school, community and business relationships.

### **NGfL Schools**

As the main beneficiaries of the NGfL policy, K-12 schools in Britain have become places of change and excitement and this change goes far beyond good computer:student ratios, with the real focus on the development and use of software and services by and for teachers and students alike.

In contrast to Australia where there is no equivalent national leadership policy in the schools area of e-learning, and where so many education programs can be piecemeal and differing from state to state, the Grid spells out clearly what is desirable.

- The establishment and distribution of a national learning resource to help raise educational standards, especially in regard to literacy and numeracy targets.
- New information and learning resources for teachers to improve and maintain their ICT skills.

- Programs to ensure that serving teachers feel confident and are competent to teach using ICT within the curriculum.
- Programs that ensure that school leavers have a good understanding of ICT, complete with measures for assessing competence.

For further information on these initiatives see Appendix II: International – National Grid for Learning.

### **NGfL Teacher Professional Development**

The NGfL has recently assigned \$A460 million to train teachers serving in the curriculum use of ICT, with a further \$A40 million to be used to train public librarians.

With professional development a clear priority in the UK, and with ICT skills now mandatory in teacher education, it is not surprising that 73.4 per cent of UK teachers (more than ever before) have recently reported feeling confident using ICT in their teaching (Department for Education and Skills, 2001).

This will make the UK a world leader in professional development and no doubt this 'knowledge product' will soon be available globally (refer Appendix II: International – National Grid for Learning).

### **NGfL Community**

One of the most important aspects of the Grid is its focus upon the needs of the broader community. Through encouraging public libraries, schools and the Learndirect initiative to work together, the Grid is promoting and providing community access to lifelong learning opportunities. It is an acknowledgment that all types of educational institutions – formal and informal, primary, secondary and tertiary sectors – can be linked to meet the learning needs of a knowledge community.

The community based aims of the Grid include:

- The removal of barriers to learning, to ensure quality of access for everyone.
- To ensure that librarians are competent ICT users and enablers.
- To ensure that administration between education bodies, the government and its agencies cease to be largely paper-based.
- To improve the quality of life in Britain (refer Appendix II: International – National Grid for Learning).

### **Community Grids for Learning: Dudley**

The Community Grids for Learning initiative ([www.ngfl.gov.uk/comgrids](http://www.ngfl.gov.uk/comgrids)) operates as a series of open networks that enable Internet access from any part of the UK. The Community Grids aim to encourage more adults to become life long learners and are currently being developed for local and regional communities. The Dudley Grid for Learning is a good example.

The Dudley Grid for Learning was the first Community Grid to link the payment of a contractor to educational standards. It does this with a payment mechanism that has been developed to:

- provide local accountability at school level;
- reflect the development of the service over the contact period;
- reflect the different types of outputs required from the services;
- provide an increasing impact on payment if performance drops below targets; and
- enable performance to be effectively measured and monitored.

Two years on, the Dudley Grid has installed networks, PC's, peripherals and curriculum and management software in 110 schools. More importantly, almost all staff have participated in targeted professional development. Raising standards in teaching and learning, DGfL states that ICT change 'begins in our schools but aims to reach out to influence the learning, working and leisure opportunities of the whole Dudley Borough community and beyond'.

### **NGfL Infrastructure**

A further key focus of the activities of the Grid is the connection of the UK's 4,300 public libraries to the Grid, known as the People's Network ([www.peoplesnetwork.gov.uk](http://www.peoplesnetwork.gov.uk)).

This \$A340 million initiative aims to link the public library to the Internet and the National Grid for Learning by 2002. Libraries will have their range of services broadened, become more integrated and once again be 'our street-corner universities' (Secretary of State, Chris Smith, 2000). At the current time, the NGfL project has three components.

1. The development of learning centre infrastructure in public libraries (\$A200 million).
2. The development of digital community learning materials (\$A100 million).
3. The training of all public library staff to use and help members of the public to make the most of these technologies (\$A40 million).

### **NGfL Quality and Content**

The NGfL is as much about the development of learning software and the digitisation of content, and the development of digital repositories, as it is about infrastructure. This is why the NGfL is focusing upon developing indicators of quality for online content. It is leading the way with initiatives like Spark Island, BBC Schools Online and the New Opportunities Fund for-digitise.org.

### **NGfL Public and Private Partnerships**

Public Private Partnerships are at the centre of the aims of the NGfL. With the UK government committed to promoting the activities of private companies, support for these partnerships represents an important shift in Labour government policy. One good example of a private company's development of quality learning content is the 'Face-2-Face with Finance program'.

'Face-2-Face with Finance program' is an initiative by Britain's NatWest Bank. Designed to teach 11-19 year olds about personal money management and enterprise skills, the topics include Basic Banking,

Cards & Card Services, Tender and the EMU. The Face-2-Face website provides teachers with free access to education resources and an interactive curriculum guide that shows how the materials link to subjects, age groups, key skills and keywords.

Other features include online quizzes where students and teachers can test their knowledge and a computer simulation program called 'Budget or Bust' which focuses upon the money management for first year university students. At the end of July 2001, more than 252,000 students and 2,500 schools had taken part in the program (refer Appendix II: International – National Grid for Learning).

### **Other Programs**

Alongside the NGfL is a range of overlapping and related policies. One of the most important of these is Beacon Schools which aims to close the gap between the best and worst performing schools in the UK.

### **Beacon Schools**

Beacon Schools was launched in September 1998 with the aim of identifying schools that could provide benchmarks of excellence. The benchmarks were developed in areas including specific curriculum subjects, teachers' professional development, student monitoring, school management, learning for gifted and talented children, parent involvement and special educational needs.

Encouraged to partner with lower performing schools in areas of 'recognised deprivation', Beacon Schools are more than just showcases. It is expected that there will be more than 1,000 Beacon Schools by the end of 2001. Each Beacon School receives additional funding of \$A70,000 per year.

### **Conclusion**

e-learning in the UK is alive and well. At both the national and local levels, the NGfL has provided a unified framework for resources and action. The Grid has also signalled a new direction in the delivery of education with government and the private sectors often working together to improve students access to and use of ICT. That learning in the UK is not just about what happens in schools, but in the broader community, indicates its priority in government policy and points to the convergence of the many educational sectors in the future. As such, the UK has much to offer countries like Australia.

chapter eight  
e-learning in australia

## Introduction

There is no national policy for the implementation of the transformation of education and the adoption of e-learning in Australia. There is the education and training action plan for the information economy 2000, 'Learning for the Knowledge Society', that covers the issues that the Commonwealth and states need to address ([www.dest.gov.au/edu/edactplan.htm](http://www.dest.gov.au/edu/edactplan.htm)), but there is nothing comparable, for example, to the National Grid for Learning in the UK. Rather, the Commonwealth develops policy and provides funding across education, while every state has its own policy framework for public schools based on different understandings of online needs and delivery.

There is also the system of independent and private schools which have access to Commonwealth funding and which generally have distinct policies and practices (refer Chapter Nine, Case Study 1: Methodist Ladies' College, Melbourne, VIC).

## Commonwealth

At the national education level, policy and programs come from one of two bodies, the Curriculum Corporation ([www.curriculum.edu.au](http://www.curriculum.edu.au)) and education.au limited ([www.educationau.edu.au](http://www.educationau.edu.au)).

Owned by Australian Ministers for Education and Training and charged with providing curriculum support to schools, the Curriculum Corporation operates a number of services, including the schools' Library program that is the main provider of bibliographic resources to Australian schools.

The second key player in Australian education at the national level is education.au limited. Also owned by Australian Education and Training Ministers, this not-for-profit company is the means by which the agreements of the Ministerial Council for Education, Employment and Youth Affairs are implemented. education.au limited aims to address the challenges presented by the Internet for the education sector.

The new Learning Federation is a joint initiative of these ministerially owned companies. Its aim is to create a pool of online learning objects such as the Digital Repository for Schools (refer Appendix IV: Online Learning Communities – Australia).

EdNA Online is the Education Network Australia, and is the leading learning community for Australian teachers. It provides an integrated platform and information on all facets of teaching and learning.

## States

The following is a brief overview of various e-learning strategies across the Australian states. It is not a comprehensive study but a guide to policy, priorities, initiatives and achievements which can provide a perspective for teachers.

To provide more specific coverage of developments within individual schools, two case studies are included in this report.

While there are significant differences across the Australian states there are also some common concerns and objectives that are now increasingly referred to as 'the new basics'.

One area is a profile of the skills that school leaving students need for the twenty-first century. In keeping with some of the concepts of the knowledge economy – where students are required to do something with their knowledge – the state profiles are generally set out in relation to competencies. The following is a useful example taken from the Adelaide, SA Declaration, 1999.

On leaving school, students should have achieved the following competencies.

- the capacity for, and skills in, analysis and problem solving, along with the ability to communicate ideas and information; students should also be able to plan and organise activities and to collaborate with others.
- the attainment of employment related skills and an understanding of the work environment, career options and pathways as a foundation for, and positive attitudes towards, vocational education and training, further education, employment and life-long learning.
- the ability to be confident, creative and productive users of new technologies, particularly information and communication technologies, and to understand the impact of those technologies on society.

What follows is an overview of each state in reference to policy, infrastructure, professional development and resources and content.

## **Victoria**

### **Policy**

There has been a major commitment in Victoria to the provision of infrastructure. 'Learning Technologies' is a clearly established policy and program priority for the Victorian Department of Education. With the goals of improving student learning outcomes, improving school business operations and equipping students with information age skills, Victorian education operates within a strong framework of equity in terms of both infrastructure and education services.

### **Infrastructure**

Currently in Victoria, there are close to 123,000 computers in schools with 33,455 teachers enjoying the use of a personal laptop. In 2002, the Department estimates that the computer to student ratio will be brought to 1:4 which is claimed to be among 'the best in the world'. While statistics vary, Victoria shows computer to student ratios ranging from 1:10 for the Northern Territory, 1:8 for NSW and 1:6.5 for Tasmania.

VicOne ([www.vicone.net.au/](http://www.vicone.net.au/)): is a AAPT-sponsored, high speed telecommunications network that links over 3,000 government offices, schools, courts and police stations and hospitals in Victoria.

At the current time, VicOne provides the following range of services: EduNet, Edumail (email to all schools, including Catholic and Independent), EduLibrary (online documents), EduConf (video conferencing), EduCast (web casting), EduLink (data transfer) and SOFWeb (departmental school website).

NetDays: is an innovative internal program that uses volunteer labour to network classrooms to schools free of charge. To date, more than 5,000 classrooms have been networked in almost 800 Victorian schools.

access@schools: is a \$1 million initiative by Multimedia Victoria that enables regional and rural schools to open their ICT facilities to community use.

### **Professional development**

One of Victoria's most recent initiatives in professional development is the establishment of the Victorian Institute for Teachers. The Institute is being set up to provide ongoing professional development to teachers and promote the status of teaching throughout the state.

Another professional development initiative taking place in Victoria is 'Notebooks for Teachers'. This program provides Victorian primary and secondary school teachers with a personal laptop and mandates participating teachers to commit 40 hours of professional development time and \$150 per annum. The Department reports that since the program was implemented, routine computer use by teachers has increased significantly.

### **Resources and content**

Navigator Schools ([www.sofweb.vic.edu.au/navschls/](http://www.sofweb.vic.edu.au/navschls/)): is an initiative to provide a select group of schools with high-quality technology, support and technical staff.

SOFWeb ([www.sofweb.vic.edu.au/](http://www.sofweb.vic.edu.au/)): is reported to be the most heavily used educational website in Australia. A source of documents, support information, teaching materials, links and interactive forums. The following is a selection of initiatives hosted at the SOFWeb portal site.

- IdeaBank ([www.sofweb.vic.edu.au/ideabank/index.htm](http://www.sofweb.vic.edu.au/ideabank/index.htm)): is an initiative designed to create a database of teaching and learning strategies that link the curriculum with key priorities.
- Global Classrooms Project ([www.sofweb.vic.edu.au/gc](http://www.sofweb.vic.edu.au/gc)): is a database of online collaborative projects developed by classroom teachers and their students. For students, the Global Classroom project offers the opportunity to collect and analyse data, problem-solve, hypothesise, predict, investigate and communicate with other students, individuals and organisations anywhere in the world. This is a significant departure from the inward-looking classroom of old. The project also promotes the exchange of ideas, opinions and experiences as well as the opportunity to create and publish new work on the Internet.

## Western Australia

### Policy

The new vision of the Education Department of Western Australia is called Education to Community (e2c). This policy sets out the strategic direction for Information and Communication Technologies (ICT) in K-12 schools for the next five years.

While provision of infrastructure is recognised as basic in this new policy, the need to refocus upon the application of learning technologies to school curriculum rather than simply achieving a target computer to student ratio has also been recognised.

e2c has seven primary benefits across the areas of e-learning and e-business, enabling infrastructure and access to information. The e2c benefits are that it:

1. enables teachers to achieve improved learning opportunities for students;
2. engages the community in the knowledge economy;
3. allows schools and teachers to focus on core business;
4. capitalises on the organisation's knowledge assets;
5. provides equity of access to learning resources;
6. implementation of a modern, scalable and open technology infrastructure; and
7. re-alignment of its services to support core organisational requirements.

This policy builds upon current initiatives in infrastructure, professional development and resources and content.

### Infrastructure

'Enabling Infrastructure' will see an enterprise wide, scalable IT system that will be centrally managed and based upon a services model. This means that schools will be connected on a single broadband network with desktop computers provided to all schools.

Satellite Receivers in Schools: is a project aimed at providing satellite receivers and decoders to all rural and remote schools. Given the dispersed nature of schools in Western Australia, the use of satellites is one way by which all schools can have access to technology.

Learning Technologies (formerly Computers for Schools): is the name of a major policy initiative that aims to provide hardware, networks, technical supports and software to government schools and professional development to teachers.

Evaluations to date suggest that increased number of computers has not always translated to increased student access, use or integration into teaching and learning programs in schools. On the downside, breakdowns in information technology have been found to be frequent with lengthy time delays in repairing faults that, in turn, have been disruptive to classes and a discouragement for teachers.

Technology Focus for Schools ([www.eddept.wa.edu.au/centoff/tisp/tech.htm](http://www.eddept.wa.edu.au/centoff/tisp/tech.htm)): is a grouping of 23 schools that have received additional funding to showcase information technology in the school learning environment. The program is also said to provide an 'added repertoire' of teaching methods for teachers.

### **Professional development**

Internet in the Curriculum ([www.eddept.wa.edu.au/centoff/tisp/internet.htm](http://www.eddept.wa.edu.au/centoff/tisp/internet.htm)): is a state-wide initiative that seeks to ensure that every West Australian government school has the opportunity to connect to the Internet.

### **Resources and content**

Innovation in the Classroom ([www.eddept.wa.edu.au/centoff/tisp/innovate.htm](http://www.eddept.wa.edu.au/centoff/tisp/innovate.htm)): is a project that aims to increase teachers' expertise in using information technology in teaching and learning, as well as for professional development and collaboration.

Technology Focus ([www.eddept.wa.edu.au/centoff/cmisis/eval/technology/index.htm](http://www.eddept.wa.edu.au/centoff/cmisis/eval/technology/index.htm)): is an information site that provides teachers with a range of information and resources in areas such as technology and pedagogy, software, web publishing and software reviews. That the site has sections for 'newbies' and 'advanced users' is a useful approach.

## **New South Wales**

### **Policy**

A major policy driver for the state is a document called NSW Public Schools Strategic Directions 2000 – 2002. The policy lists a number of aims to promote the state as a 'world leader' in the production of 'literate, numerate, well-educated citizens with the capability and confidence to make a positive contribution to our society'.

### **Infrastructure**

'You've got mail' is the most recent new initiative of the NSW government where connectivity is concerned. With an outlay of \$33 million, 'You've got mail' aims to provide more than 1.33 million NSW public school and TAFE students and teachers with email accounts by June 2003.

To be known as 'e-learning' accounts, students will be able to design personal websites and have filtered Internet access.

Technology Initiatives and Projects: is the flagship policy program of the Educational Technologies Unit within the Department of Education and Training. The Unit provides support and strategic advice to schools to support the use of technology in teaching, learning and administration.

The activities of the Unit currently take three main forms. These are profiled below.

Computers in Schools Program Hardware Rollout ([www.schools.nsw.edu.au/staff/F6.0/hardware.htm](http://www.schools.nsw.edu.au/staff/F6.0/hardware.htm)): now in its fifth phase, this \$186 million program has provided NSW public schools with access to a range of technology, including more than 90,000 computers by 1999. Hardware is supplied on a three year lease agreement via the Commonwealth Bank of Australia with equipment remaining the property of the bank during the lease period.

Extension of Network Cabling ([www.schools.nsw.edu.au/staff/F6.0/cabling.htm](http://www.schools.nsw.edu.au/staff/F6.0/cabling.htm)): is a program whereby schools receive a one-off grant of \$750 to connect ISDN lines to their existing networks.

Cool School 2001 ([www.schools.nsw.edu.au/webawards2001](http://www.schools.nsw.edu.au/webawards2001)): is the annual schools' web design awards. These awards are aimed at encouraging teachers and students to actively engage with the Internet, to become familiar with web design tools and to immerse themselves in the new order of communications.

### **Professional development**

The hardware rollout has been accompanied by 15,000 teachers undertaking ICT related professional development which has included the use of innovative technology such as satellite delivery and CD Roms. This has been used to both broaden teacher training and supplement PD courses such as TILT.

### **Resources and content**

In addition to technology initiatives and projects, there are other innovative e-learning and technology developments that exist in NSW schools. Three of these are profiled below.

HSC On-line ([www.newhsc.schools.nsw.edu.au](http://www.newhsc.schools.nsw.edu.au)): is a joint venture between the NSW Department of Education and Training and Charles Sturt University.

Director General School Achievement Award and Apple Distinguished School Award: this NSW award program was most recently awarded to Arthur Philip High School in Sydney's Parramatta ([www.aphs.nsw.edu.au](http://www.aphs.nsw.edu.au)). The school seeks to prepare its 'students for the cyber age'. Arthur Philip is a technology oriented school that has been successful in integrating technology into school culture and the success of the school is attributed to the following factors.

- Arthur Philip teachers are keen to maintain their skills in technology, web design and online course development.
- There are 300 fully-networked computers (PC + Mac) channelled into labs and most classrooms. There is also a library IT Centre and school Internet café.
- There is extensive additional equipment: digital cameras, digital /DV video equipment, scanners and all the latest software (Apple, Adobe, Microsoft, subject-specific software).
- There is Intranet and Internet access for students at over 200 sites across the school: students can email work home and send it back the next day.

- There is a full range of computing courses for years 7 – 12 including Software & Design, Information Processes and senior Information Technology (IT) and Visual Design.
- Every effort is made to encourage the innovative use of technology in all courses across the curriculum with some courses being delivered online.
- It is also interesting to note that in this school, 80 per cent of senior students (approximately 2,000 students), complete at least one VET course as part of their HSC/UAI. This is well above the state average of one in three or 30 per cent of all students taking a VET subject.
- Most students at Arthur Philip undertake work placement in the Parramatta CBD. This means that the school is networked to a community of supportive businesses such as Kinkos (IT), Courtney's Brasserie (Hospitality), Parramatta Park Royal (Hospitality, Business Services). In addition, IT placement students have designed several entire websites for local primary schools (Bert Oldfield and Rydalmere East) as well as small business.

Country On-line: is a new program which enables rural communities to use school computer facilities to gain access to the Internet.

## **South Australia**

### **Policy**

In relation to e-learning and the use of technology in learning, South Australia has several innovative and exciting new media policy programs. These are grouped by the name 'Learning Technologies SA'.

ICT Competencies Project ([www.tsof.edu.au/LT.SA](http://www.tsof.edu.au/LT.SA)): this program is part of Learning Technologies SA and aims to ensure that all students aged 6–16 years receive an education in the use of information technology and telecommunications and that they leave school with an industry-recognised information technology qualification (Certificate 1 in Information Technology).

### **Professional development**

Online ICT Module: Teaching and Learning with New Technologies ([www.tsof.edu.au/LT.SA](http://www.tsof.edu.au/LT.SA)): is an online module that has been designed by the Technology School of the Future in conjunction with The School of Education at Flinders University.

This module directly addresses the professional development needs of teachers regarding the use of new technologies to support teaching and learning. Through this 12 week course, teachers are encouraged to think about the role of ICT in their teaching in ways that are supported by 'sound learning theories' and how ICT can be integrated into learning. In particular, teachers are exposed to:

- articulations of knowledge about learning processes and strategies;
- information and communications technology in learning and teaching;
- examples and evaluation of information and communications technology use;

- preparing an information page;
- planning a unit of work;
- trial and evaluation of units of work;
- reporting outcomes; participating in online discussions; sharing ideas; and
- recommendations on the use of information and communications technology to enhance learning.

### **Resources and content**

The three main initiatives of the Learning Technologies project are profiled below.

Discovery Schools ([www.tsof.edu.au/LT.SA/ltproject/framesettlproject.htm](http://www.tsof.edu.au/LT.SA/ltproject/framesettlproject.htm)): the Discovery Schools program is a grouping of six schools who are expected 'to positively influence other schools on how to use learning technologies'. They are doing this by reflecting on researching and developing 'the exemplary ways' in which learning technologies can be embedded in school curriculum.

Technology School of the Future ([www.tsof.edu.au/LT.SA/tsofuture/framesettsofuture.htm](http://www.tsof.edu.au/LT.SA/tsofuture/framesettsofuture.htm)): is a five year, statewide initiative to develop IT in schools. The program would oversee the establishment of a major centre for teacher development in learning technologies.

The Technology School of the Future states that it already has partnerships with a range of industry leaders in the use of technology in schools. These partnerships are said to 'provide for cooperative development and promotion of the latest developments in the field'.

DECStech 2001 ([www.tsof.edu.au/LT.SA/decstech/learn\\_future.htm](http://www.tsof.edu.au/LT.SA/decstech/learn_future.htm)): established in 1996, DECStech 2001 is the \$85.6 million flagship policy of the SA Department of Education, Training and Employment that aims to ensure that information technologies become an integrated part of learning activities at all levels in the curriculum.

Through the Learning Technologies Project, DECStech has the following objectives:

- Research models of best practice ([www.tsof.edu.au/LT.SA/ltproject/discoveryschools/index.htm](http://www.tsof.edu.au/LT.SA/ltproject/discoveryschools/index.htm));
- Provide PD for teachers ([www.tsof.edu.au/LT.SA/decstech/tdframeset.htm](http://www.tsof.edu.au/LT.SA/decstech/tdframeset.htm));
- Equip principals to be leaders and decision makers about technology ([www.tsof.edu.au/LT.SA/bin/leader/index.htm](http://www.tsof.edu.au/LT.SA/bin/leader/index.htm));
- Develop resource materials ([www.tsof.edu.au/LT.SA/ltproject/globaldiscoveryschools/index.htm](http://www.tsof.edu.au/LT.SA/ltproject/globaldiscoveryschools/index.htm)); and
- Measure changes in student learning outcomes attributable to the use of learning technologies.

## Tasmania

Education in Tasmania is currently driven by the 'Learning Together' policy framework – a key component of 'Tasmania Together', Tasmania's 20 year social, environmental and economic plan. Learning Together incorporates many of the learning trends noted in our analyses of the of the UK, Canadian, US and some other Australian education environments.

Tasmania has a clear focus upon professional development for teachers – especially new teachers. It is committed to forming strong links between schools, the community and business.

### Policy and infrastructure

Tasmanian policy appears to be directed more towards the concept of a knowledge society than specific ICT projects and aims.

Learning Together ([www.education.tas.gov.au/learningtogether](http://www.education.tas.gov.au/learningtogether)): is the Tasmanian Government's long-term strategic plan for education, training and information services.

The result of substantial consultation and feedback, a draft vision statement was released in February 2000. Incorporating many of the views expressed by Tasmanians about the future for government schools, Learning Together is said to confirm present initiatives while putting forward additional new strategies.

With a Learning Together Council soon to be established to monitor the implementation of the plan, Learning Together is expected to:

- Create more flexible and innovative school management;
- Integrate community strengths into school programs and increase the shared use of facilities;
- Develop a new school curriculum for the twenty-first century;
- Promote lifelong learning goals and opportunities;
- Create a single Tasmanian TAFE Institute;
- Create a Centre of Excellence for the production of online learning content, programs and services and to develop links with industry and business;
- Create opportunities for the promotion of Tasmanian culture and heritage (including web-based sister school links for all schools); and
- Create partnerships between libraries and adult education.

### Professional development

For teachers, Learning Together is anticipated to:

- Enhance the professional status of teachers through awards, during a new Education Week celebration;
- Open up teacher communication with the Department of Education;

- Improve web-based information and Internet access;
- Increase professional knowledge and skill development of education staff (including time release initiatives for new teachers, refresher courses for returning teachers and new skills opportunities for non-teaching staff); and
- Provide teacher relief for teacher release for short courses and other professional development.

Professional development modules that are currently available include:

- Introduction to Online Learning;
- Design an Online Module; and
- Teacher Developed Modules.

Discover Web Forums – Leadership and New Technologies ([www.forum.discover.tased.edu.au/webforum/education/cgi-bin/forumdisplay.cgi?action=topics&number=22](http://www.forum.discover.tased.edu.au/webforum/education/cgi-bin/forumdisplay.cgi?action=topics&number=22)): provides a discussion space for Tasmanian teachers to explore a range of issues in unmediated formats.

### **Resources and content**

As a key component of the broader Tasmania Together initiative ([www.tasttogether.asn.au](http://www.tasttogether.asn.au)), the Learning Together project, once implemented, stands to inject twenty-first century vision into education in Tasmania.

While the Learning Together policy is still in its consultation stage, there are other initiatives – all within the ‘Discover’ umbrella – which embrace e-learning and ICT technologies in an educational context ([www.discover.tased.edu.au](http://www.discover.tased.edu.au)).

Discover Online School ([www.discover.tased.edu.au/netlearn/school/school.htm](http://www.discover.tased.edu.au/netlearn/school/school.htm)): is the program whereby Tasmanian schools can take part in the cross delivery of online programs and where multi-school online classrooms are created.

Coordinated by the e-magine Centre of Excellence in Online Learning, these online programs include forums, discussion boards, WebCT and videoconferencing. Among the main objectives of this Online School are:

- curriculum diversity and richness for rural and small schools;
- extension, challenge and enrichment programs;
- reshaping of the curriculum delivery and structure; and
- programs for specific groups (eg students at risk).

Under the cross school delivery element, schools are linked by online classrooms which enable classes in one or a number of schools to receive programs from teachers in other schools.

Digital Repository: In order to engage school age 'net generation' learners, it is recognised that online content must be engaging and motivating. A range of online objects and learning modules is therefore available on Discover for teachers to use within their classrooms.

Online Modules ([www.discover.tased.edu.au/netlearn/currex/default.htm](http://www.discover.tased.edu.au/netlearn/currex/default.htm)): is the program that provides Tasmanian teachers with access to a range of online professional development short courses and resources.

e-Learning Exchange ([www.discover.tased.edu.au/netlearn/currex/default.htm](http://www.discover.tased.edu.au/netlearn/currex/default.htm)): is the initiative that invites schools to advertise their own online programs, to involve students in these programs or collaborate with other schools in similar projects.

## Queensland

The first to introduce the term 'the new basics', Education Queensland has developed policy and practice in relation to the transformation of education and the introduction of the new technologies. In March 2002, the government announced a major long-term investment in school Information and Communication Technologies. As part of the 'Smart State' initiative, it will invest \$23 million followed by \$35 million annually to provide 3,000 new computers in state schools, speedier replacement of old computers and better training and technical support for teachers. The following overview refers primarily to state initiatives, however it should be noted that schools such as John Paul College for example, are world leaders in the education revolution, and have developed exemplary theory and practice for the integration of the digital medium into education.

### Policy

Schooling 2001 ([education.qld.gov.au/tal/2001/abo\\_int.htm](http://education.qld.gov.au/tal/2001/abo_int.htm)): is the umbrella name for a wide range of projects, including learning technology grants and system-wide initiatives. With the aim of providing resources and support for schools where learning technologies are concerned a number of targets were identified for the year 2001. Aimed at setting a clear direction for learning technology programs in schools these targets included:

- improved student learning achievements through the use of learning technology;
- computers in every classroom for use across all eight key learning areas and all year levels (P to 12) and by students with special needs;
- a ratio of at least one computer per 7.5 students with an aim to move to 1:5;
- school networks that give every classroom access to the Internet;
- all teachers with a minimum level of skill in the use of computers for learning; and
- quality curriculum software and courseware systems available to all students and teachers.

## **Infrastructure**

Framework for Management and Learning Technology Plan: One of the 1999–2000 targets for Schooling 2001 is for schools to have a 3–5 year Management and Learning Technology (MALT) Plan.

School LAN Project: this initiative aimed to provide all schools with Local Area Networks by the end of 2001.

## **Professional development**

Minimum Standards for Teachers – Learning Technology: one of the key areas of the Schooling 2001 Project is professional development. Within this framework there are four key minimum standards for teachers that have been identified. These are:

- Information Technology skills;
- Curriculum Application including classroom planning and management;
- School Planning; and
- Student Centred Learning.

As part of this initiative, professional development grants are directly distributed to schools. All schools receive funds to develop, maintain and increase teachers' skills in the learning technology standards and the application of these to learning and teaching, in all key learning areas, P-12.

Based on teacher numbers, the amount ranges from \$500 to \$550 for each teacher with a floor of \$600 per school.

These professional development funds may be spent on any service or resource which helps to achieve the Schooling 2001 target. This can include: teacher release, laptops for teachers, registration fees for courses, payment of professional development providers, and professional development and training materials. The program notes that the most successful PD programs address the identified needs of staff. Decisions about the most effective use of the funds is made in consultation with teachers and Local Consultative Committees.

## **Resources and content**

Virtual Schooling Service Pilot 2002 ([education.qld.gov.au/virtualschool/htm](http://education.qld.gov.au/virtualschool/htm)): this online learning initiative will provide courses in six different subject areas for students in Years 9 to 12. With 18 teaching staff, subjects for 2002 will include: Economics, Maths, Japanese, Computer Studies, Modern History and Information Processing and Technology.

While it is advised that students need to be self-directed and competent users of technology, it remains for participating schools to provide:

- IT support;
- a supervisor (a responsible adult to supervise synchronous – that is, 'real time' – lesson activity);

- a study coach (teacher/administrator to supervise and guide student management of their workloads and to authenticate assessment items);
- a timetable that will allow for students to be involved in both synchronous and asynchronous activities;
- student access to appropriate 'hardcopy' learning materials;
- support services such as photocopying and faxing;
- access to hardware;
- access to a suitable learning space;
- SINA account allocation for email and download requirements in excess of that allocated to students not participating in VSS; and
- access to resources which support the subjects being studied.

## **Australian Capital Territory**

In August 2000, the Australian Capital Territory became the first Education Department to appoint its own Chief Information Officer (CIO). This is indicative of the Territory's commitment to the new technologies.

### **Policy**

The ACT is active in addressing ICT needs and promoting e-learning in four main areas, including electronic students, e-services, switched on staff and infrastructure.

School IT Plans: most schools in the ACT have an IT Strategic Plan, an IT committee and an IT coordinator. Schools participate in, and receive support from, two IT networks and the IT coach.

### **Infrastructure**

Schools in the ACT are relatively well served by infrastructure – even for very young students. For example, most ACT government pre-schools are now connected to the Internet and email facilities through the program Pre-schools Plugged-in.

### **Professional development**

In March 2002, ACTivatED, an online education resource for teachers in the ACT was launched. The new website includes information, resources, professional development, collaborative projects, examples of best practice and useful ideas for teachers. Online features include a library catalogue, journals, a forum facility and the digital resource databank.

In 2002, the ACT launched a second new program called 'Laptops for Teachers'. This is a three year, \$1.25 million program that will see all teachers in the ACT provided with personal laptop computers.

In 1999, over 3,000 hours of professional development were provided to 1,000 teachers in 151 IT courses run by the O'Connell Centre. In addition, approximately 3,900 hours of IT training were undertaken by

950 teachers. This training was provided directly by schools during their stand-down professional development days. In 2000, two extra teachers were employed centrally to provide courses and coaching for school-based staff in standard Microsoft packages.

High Schools Benchmarked: In 1999, the ICT competencies of teachers in 16 high schools were surveyed. The results of this research have been used to drive professional development strategies. With the next survey due in 2002, to date the Quality Teaching Program has found that high school teachers are growing in confidence in their personal ability to use basic applications with most teachers listing multimedia and classroom use of technologies as the most pressing training needs.

### **Resources and content**

The IT Coach program makes an IT coach available, free of charge, to government schools. The role of the coach is to provide support and advice on any IT related matters.

Year 10 IT Competencies: the Year 10 Information and Communication Technology (ICT) competencies project is a year long trial that is currently taking place in all ACT government high schools. Students who can demonstrate the competencies during the trial period will receive an ICT Competencies certificate. The five IT competencies are:

- accessing information processes and tools;
- communication and collaboration processes and tools;
- organisational processes and tools;
- authoring processes and tools; and
- presentation and visual display processes and tools.

SportNet: is an initiative of the Bureau of Sport and Recreation. Currently in pilot format, SportNet is an online tool for sport which includes both an Intranet site, web wizard to create an organisation's own site, membership database, events and function database and email access.

VET In Schools: as with other states, ICT-related VET subjects are popular among Year 11 and 12 students. In the ACT, two secondary colleges have adapted this Information Technology Course to meet the requirements for Microsoft Certification, thereby providing students with an extra qualification.

Multi-Media Centres have been established at Lake Ginninderra College, Copland College, Lake Tuggeranong College, Narrabundah College and St Clare's College. These specialised multimedia centres provide high-speed access to online information and services for schools and an ever increasing proportion of the student population.

CISCO Systems Networking Academy Programs: is an online program that is intended to educate senior high school, TAFE and university students in the design, building and maintenance of computer networks. Government schools can choose to offer the Cisco Certified Network Associate from 2001 as part of a Certificate III Network Administration course.

Innovative IT Projects: promotes IT innovation in teaching and learning as well as rewarding and recognising excellence.

## **Northern Territory**

The Northern Territory has an ambitious ICT learning initiative underway. Labelled 'Learning and Technology in Schools' (LATIS), it aims to improve student access to information technology and as a result, improve learning outcomes. Other key initiatives include the NT (DEET) portal ([www.latis.net.au/ols/portal.htm](http://www.latis.net.au/ols/portal.htm)), the Student Administration Management System ([www.latis.net.au/sams/index.htm](http://www.latis.net.au/sams/index.htm)) and the new Resource Collection ([www.latis.net.au/resources/index.htm](http://www.latis.net.au/resources/index.htm)).

### **Policy**

Currently in pilot stage, the LATIS program is expected to allocate project-based resources across schools.

### **Infrastructure**

Within the broader context, the LATIS program includes the following objectives:

- Increased access to online information and services;
- Increased teacher capabilities and improvement in the appropriateness of curriculum;
- Increased access to standardised technologies;
- Increased use of IT in the classroom – providing the IT infrastructure (workstations, Internet, LAN and WAN connection), appropriate curriculum and staff professional development is expected to increase the use of IT in the classroom, thereby increasing staff and student exposure to enabling technologies;
- Creating a learning environment more aligned to student needs, which is expected to increase motivation to learn and ability to achieve; and
- Increased exposure to and application of IT – increased school staff and student exposure to IT and increasing awareness of the potential applications of IT is expected to help ensure that students are prepared for life long learning and living in the Information Age.

Computers in Schools: The program enabled 'Compaq Computer Australia' to donate 294 'pre loved' Pentium computers to Territory schools in 2000. These computers have since been distributed via the Open Learning Support Unit to 40 Territory schools.

While 12 per cent of computers received have been assessed as unsuitable for distribution and most others have required some form of upgrade at the schools' own expense, demand has consistently exceeded supply.

Satellite Services: One of the key platforms of the LATIS program is telecommunications. Aimed at supplying Internet services to all schools in the Northern Territory, the service will allow Internet teachers

and administration staff to access the Northern Territory Government Network and to allow access to the Northern Territory Government Intranet and other services supported by this network. Later on, access to online curriculum and knowledge banks will also be possible.

### **Professional development**

LATIS Technology Enhanced Curriculum Classrooms: over the term of the LATIS Project, each Government school in the NT will be able to nominate one or two teachers, who will have access to up to forty days relief per school. These teachers will receive support for up to one year.

Learning Communities – NT-C, NT-Teach, NT-III: are three online communities for computer coordinators, IT support staff, teachers and teachers who have been involved in LATIS sponsored tertiary short courses respectively.

### **Resources and content**

LATIS Lighthouse Schools are four schools that have been identified to have a technology focus developed over the coming three-year period.

A LATIS Software Bank: a soon-to-be-established software bank will enable schools to access a range of educationally appropriate software at reduced prices. Reviews of the software will be available to help schools in their choices. Schools will also be free to purchase software from outside of the software bank.

Internet Insights for Teachers: is a website that is created and maintained by the Open Learning Support Unit of the Northern Territory Department of Education.

The Potter Project: this online learning program was devised in response to the overwhelming interest shown by both students and teachers in J. K. Rowlings' series of books featuring Harry Potter.

chapter nine  
australian case studies

The following two case studies provide some insight into how e-learning is being undertaken in schools around Australia.

The Methodist Ladies' College in Melbourne, Victoria is a single-sex private school and the Woodcrest College in Springfield, Queensland is a state co-ed school. There are many other schools that could have been show-cased as leading edge and exemplary.

Like many other schools, these two schools have taken up the challenge to transform their educational provision.

Books could be written, or digital repositories created, in relation to the work done by staff, students, parents, etc in these schools. The coverage in this report can do no more than allow a glimpse of the potential of twenty-first century learning.

# Case Study 1:

## Methodist Ladies' College, Melbourne VIC

Methodist Ladies' College (MLC), an independent school for K-12 girls, was the first school to instigate a school-wide notebook computer program in 1989. MLC caters for approximately 2,200 students who have more than 1,150 personal notebook computers. All students at MLC are said to be online students.

### **Getting a notebook**

At MLC, notebooks are introduced to students at the beginning of Year 5, when students begin digitising (keyboarding, presenting) lessons and are introduced to the hardware, software and the care and maintenance of their computers.

### **e-learning in the junior school**

While notebooks are introduced to students in Year 5, most students are familiar with the technology much earlier. The students often already know how to use word processing programs, browse the web and send emails. This trend is unlikely to change with an increasing number of students set to enter the Junior School from the school's early learning centre known as MLC Kindle.

At MLC Kindle, 'students' from 18 months onwards have access to computers for educational computer games such as WiggleWorks. By prep school, activities broaden to include drawing pictures, reading stories and spelling games using the digital equivalent of magnetic boards. In the upper years of junior school, students use Microworlds software to undertake multimedia presentations for a range of subject classwork.

### **e-learning in the junior secondary school**

From the time of their introduction, the notebooks become a key resource for all MLC students. At the current time the incorporation of the notebooks into core curriculum is at the discretion of individual teachers.

This means that because some teachers are keener than others there remains variable use of the notebooks in classroom situations or homework requirements.

### **e-learning in the senior school**

It is in the senior school of MLC that notebooks are perhaps the most widely used. Not surprisingly perhaps, it is in Years 11 and 12 where some of the most innovative e-learning occurs at MLC.

### **myMLC.net Staff version**

While the website [www.mlc.vic.edu.au](http://www.mlc.vic.edu.au) is the official external site of the college, the Intranet operates as a separate system. It is on this Intranet – or internal MLC portal – that most of the day to day activity of the school takes place.

Created in June 2001, myMLC.net (as the portal is known) acts as a one-stop-shop for all. With staff and

students provided with separate access privileges, myMLC.net for staff broadly incorporates calendars, newsletters, HR information, policies and procedures, forms and bookings, style guides, computer support, faculty homepages, subject resources and external links.

At the heart of the myMLC.net portal lies a sophisticated knowledge management system. The facilities of this system have served to convince staff of the benefits of an electronically-organised school information and knowledge management system.

#### *Tracking a Student*

The myMLC.net portal has revolutionised difficult and time-consuming tasks such as finding a student during class time. Previously the location of a student during school hours would have been tracked using paper files, a timely and inefficient undertaking, however now MLC staff can pinpoint a student from the staffroom or within classrooms.

Additionally, photographs of students are available to staff on the portal. This means that the identity of the College's 2,200 students can be verified even by staff who are not known to them personally.

#### *Form emails*

A further feature of the myMLC.net portal is the ability of staff to generate automatic emails to classes of students, individual students or parents of students. Such emails may concern absences from class or specific class requirements.

#### **myMLC.net Student version**

myMLC.net for students incorporates a subsection of the above capabilities and includes calendars, newsletters, student information, class information, faculty homepages and subject resources.

Students are also able to use their myMLC.net portal to contribute to message board discussions, asynchronous Question and Answer sessions for subjects where both can be posted for discussion and problem solving with other students and of course for email.

#### **Digital Learning Objects: To Kill a Mockingbird (Year 10 English)**

Created by MLC English teachers Sylvia Guidara and Felicity Carroll, 'To Kill a Mockingbird' is a nine week, Year 10, English unit that is based upon American writer Harper Lee's 1960 book of the same name. A paperless unit, the subject is delivered through a customised website that is accessed via the myMLC.net portal.

On the website, students work through a series of 13 activities that are based upon the main themes of the book. Depending upon the task at hand, they can do this on an individual basis as well as in small teams. In doing so, students are expected to use a variety of software to produce sophisticated and free-standing presentations on various topics.

In pedagogical terms, the students become active producers of new knowledge products that are based

upon the 'To Kill a Mockingbird' story. While the teacher and creators devised the unit to incorporate the standard elements of the Year 10 English curriculum, they have succeeded also in providing a new framework for learning that is learner-centred in focus. For these students, achieving a good grade is much more dependent upon showing mastery of a range of skills, such as the synthesis of disparate information from a range of sources, the articulation and critical analysis of main points and themes and the presentation of both in a creative multimedia format.

For both staff and students, this new approach to learning signals a powerful shift away from teacher-led instruction, to one that is collaborative, creative and largely dependent upon the learner's own interests.

### **Subject homepages (VCE Chemistry)**

In MLC senior school, chemistry remains a popular choice for students in Years 11 and 12 and while Chemistry Faculty Head John Snell freely admits that he is no 'Wiz on the Web', his functional chemistry website serves an excellent purpose.

The site was composed using Dreamweaver, a web design tool that John learnt about during professional development. It provides students with a range of useful course materials including open-template response sheets that allow students to test themselves on key learning points of the course and provides access to the Excel software that teachers use for real time online experiments in the classroom.

### **Using the Internet to gather information in class time (Year 10 Commerce)**

Year 10 Commerce at MLC provides a typical example of the ways in which technology can be incorporated into standard curriculum. On the day the authors visited, the class was being held in the Global Learning Centre classroom located within the College library – a purpose built and fully wired classroom – where students were actively searching a number of websites with the aim of gathering information on police powers with young people. The information would later be analysed and contrasted.

As the lead-up to a real life visit to the local police station in the next class, these students were learning in the new hybrid mode.

### **Online discussion lists in class time (Year 11 English Literature)**

English teacher Liz Rhodes is an ardent fan of the Internet; especially when it is used to enhance and excite her senior school English classes. As one of a breed of younger teachers who have a high personal level of IT literacy, Rhodes brings an innovative new approach to traditional classroom activities.

Observed teaching a Year 11 English class, Rhodes was facilitating an analysis of the Robert Browning poem 'Porphyria's Lover'. With a printed copy of the poem in front of them, the 15 members of the class were using a discussion list facility to analyse four key aspects of the poem. The discussion list software that was used in this class, formed part of the standard Outlook email client.

Seated around circular tables and working both individually and in pairs at their notebooks, the students posted responses and answered the postings of others. In addition to providing the agenda for this online class discussion, the four questions served to keep the conversation on track.

This collaborative online discussion list resulted in all students engaging in conversation with each other – something which may not happen in the traditional classroom setting. The fact that the discussion generated an automatic transcript meant that Rhodes could assess the students' contributions from both within class and afterwards.

### **Information Technology Infrastructure**

MLC students in Years 5 to 12 use their notebook computers at school by connecting on the school website both through cables and, more recently, through wireless technologies which are currently being trialed. Teaching staff speak of their expectation that the freedom of wireless will lead to students being able to work in different configurations, within the classroom setting.

(MLC selected a Lucent Technologies Wireless networking solution. The roll-out is expected to be completed by 2003.)

### **Smart Cards**

A further innovative use of technology at MLC concerns their new cash-less campus. The Smart Card initiative now provides students and staff with an easy access point to vending machines, the Star Café (school cafeteria) as well as for photocopying, library borrowing, and of course, for identification purposes. The card is currently issued to all staff and to students in the senior school. A cap of \$50 currently applies to the card.

### **The Compass Centre**

The MLC Compass Centre provides classroom space and online learning content and support to gifted and advanced students as well as to others for whom, for example, the traditional curriculum has been completed ahead of time.

At the current time, Compass Centre content is divided into various subject strands. Students participate in the Compass program by logging on to the Compass Centre website on the myMLC.net Intranet. Here they find a range of digital learning objects and can interact with Centre staff. With email as the preferred means of communication between Compass staff and students, learners are guided in their activities and supported in requests for attention and assistance.

Some of the content provided through the Compass Centre has been licensed from some of the world's leading names in online education and new material is constantly being developed by the College staff working with students. Compass students have access to resources of considerable depth and expertise.

## **Professional Development**

One of the most important characteristics about MLC is the strong professional development culture. As a learning community, MLC is as much about staff learning as it is about the learning by students.

In this respect, teachers speak glowingly of their own opportunities for learning and it should not be surprising that there is a high level of staff commitment to Professional Development programs, especially where the new technologies and e-learning practices are concerned. Staff know that school management is committed to their PD.

As new teacher, Cameron Bell, states 'I've been at MLC only six months and already I have undertaken more PD than in the entire three years in my previous position'.

The other thing about MLC, says Bell, is the open culture. 'Here if you have an innovative idea for e-learning you are allowed to go with it'. According to Bell, this is one of the key factors that sets MLC apart.

## **Pedagogical Issues**

Based on the constructionist approach of Seymour Paper (2001), learning at MLC has utilised computers to encourage students 'to create their own learning'. Within this context, e-learning has been a natural next step. This is because e-learning has as much to do with 'teachers teaching and teaching styles' as with 'students learning and learning styles'.

The College also acknowledges that an information society 'demands new information literacies and problem-solving skills' and that 'information is no longer constrained by text – and that images increasingly dominate our media.

'Just as all languages have a grammar and syntax which have traditionally been taught in schools, the new 'grammar' of visual design is an area MLC is striving to address. [Indeed] students at MLC expect to create meaningful multimedia presentations across the curriculum'.

All of this, says the school, prepares students 'for the challenges of their future work environments'.

## Case Study 2: Woodcrest College, Springfield QLD

Woodcrest College is a coeducational state school at Springfield – a housing development estate on the outskirts of Ipswich, Queensland. It receives a standard allocation of resources (including staffing) yet it is a school involved in the process of educational transformation and is startlingly different. This in itself calls for some form of explanation.

Two factors which may be of significance are that the school is new and that it is part of one of the first computerised communities.

While it will be a P to Year 12 school, Woodcrest only opened in 1998 and in 2002 only goes to Year 10 (there are 1,400 students). Some members of staff suggest that it is because the school has no traditional 'baggage' that it has been able to achieve so much. However all staff feel that the expansion of the school so quickly, also has its difficulties.

The other distinctive feature of the school is that it is part of one of the first computerised communities. The housing developer providing a multi-media computer to every house purchaser that connected to Community Net which has a big input from the school. This access can have the effect of making Internet connections as much a reality taken for granted as running water and electricity.

The school's reputation for e-learning innovation is widely known and there is a constant stream of visitors including international visitors. There is even a pre-packaged presentation for guests that outlines the school's philosophy and practice.

### Curriculum

'The School Curriculum Program Overview 2001-2002' provides much of the relevant background information about the school and sets out its aims and objectives.

The curriculum is based on:

- Core Learning Outcomes, as set out by the Queensland School Curriculum;
- Key Learning Areas, which form the basis of the Syllabus; and
- Woodcrest College's Generic Learning Outcomes (referred to as GLOs).

The Key Learning Areas (KLA), which are articulated for each student cover:

- English
- Maths
- Science
- Studies of Society and Environment

- Health and Physical Education
- along with the Arts, Technology, Languages Other Than English (LOTE).

The school has taken the prescribed syllabus and adapted it for e-learning purposes.

The KLAs are arranged in units of study including topics such as 'Past, Present and Future Earth and Beyond, etc' and reflect an integrated approach. A 'constructivist' or knowledge making methodology has also been adopted with the staff doing their own share of knowledge making to provide the resources for achieving the GLOs.

The goals that have been set for students as citizens of the twenty-first century are that they should be able to:

- develop a positive sense of self;
- work independently – and with others – in a variety of situations, roles and environments;
- develop skills of a responsible citizenship;
- gain and organise information from a variety of sources;
- make meaning of information;
- communicate understandings in a range of forms; and
- apply understandings to solve problems and perform practical tasks.

For the staff, the philosophical underpinnings of their teaching are:

- the adoption of a constructivist approach to learning, whereby the students create the meanings and the knowledge, rather than have it transmitted to them;
- that all people have the right to develop their creative and intellectual potential;
- that all members of the school community work collaboratively in teams (this includes staff and students);
- that each student can become a contributing and valued community member; and
- that students and staff should be encouraged and empowered to make appropriate decisions and accept personal responsibility.

An integrated curriculum means that there are no specific periods for specific subjects. For example, there are no English or Social Science segments. Rather the KLAs and outcomes are organised into broad themes of study such as Well Being and Constructing Our World, where emphasis is on the connections and relationships among people, ideas, objects.

On the premise that all students can take responsibility for their own work, and that all students can learn and achieve (in contrast to 'failing'), the units of work are outcomes based. Each student, and groups of students, can demonstrate their 'know how' and show what they can do. 'Quality knowledge products' are the terms used to describe the way in which outcomes and assignments are classified.

Teachers monitor, check and evaluate learning outcomes, many of which are achieved independently by learners. Teachers are readily available to make recommendations, suggest additional materials, create digital resources and provide ongoing support to groups and individuals, so that the learning goals may be met.

At Woodcrest, it is accepted that living in the twenty-first century will be about living with change and that in order to function well in such an environment learners need the ability to apply knowledge to new situations. An integrated curriculum enables students to transfer knowledge, attitudes, values and skills from one context to another and to relate their learning to real life situations.

### **Organisational structures**

In order to achieve these goals, the school has also developed innovative organisational structures.

For example, there is no timetable. Teachers openly state that a rigid timetable is one of the biggest artificial obstacles to ongoing learning. This is because learning can be delivered online to each student as required, rather than the old one-size-fits-all model (associated with the timetable) that cannot meet individual needs. Teachers also claim that it was no big deal to abolish the timetable and that no one wants to return to such a form of regimentation.

Every class from P to Year 9 has its own home room and specialist teachers come to the home room, rather than students migrating from one room to another all day. There are no interruptions. Students can work all day on their quality knowledge products if this has been agreed and they don't have to respond to bells or switch subjects.

Each class is also a combined one (covering two grades) and has two teachers who work as a team. Teachers work together to construct the curriculum, prepare resources, and to teach. This means that one teacher can be available for individual assessment and support, while the other serves as a resource for all.

Teachers are innovative, creative and professionally responsible. They develop and 'own' their own teaching methods.

There is no 'centre' to a classroom, that is no blackboard and no rows of desks. Without reorganisation it would be difficult for example to show a video to the whole class. Visitors to the classroom are not even an interruption, unless directly introduced. Many students remain oblivious to their presence.

Students work in clusters or groups and some work individually. Every classroom has multiple computers (Macs), printers, scanners etc. and all are generally in use. There have been no computers stolen and the school reports absolutely minimal damage to the computers and network. (One mouse has been broken, but that is the limit.) The school suggests that the students are so committed to their computers that they 'police' them and no one would be game to damage or destroy anything.

The school strives to be paperless. The absence of photocopiers is noticeable. As is the absence of set text books.

There is no sense of technology as an add on, as something extra or separate. It is how the classroom works. The students are more than competent and at ease with the technology around them. There is no student who cannot make knowledge products on the computer and no student for whom there are not positive outcomes.

The students are clearly self directed. Many work 'unsupervised' – even from an early age. Teachers have very high expectations of them. All students have a digital portfolio – a digital showcase of their work that can accompany them through their school career. It would be relatively easy to make these resources the basis of a digital repository.

There is a behaviour management unit and a specific behaviour management code. The unit is always staffed and it provides students with responsible thinking time and behavioural problems are minimal.

While English, for example, doesn't exist as a subject (although some students 'specialise' in English studies) the staff insists that literacy skills are more important than ever. Considerable effort has gone into adapting literacy skills for the online environment. It is described as 'developing a common language for the new technology culture'.

Because the school has transformed learning, there are some difficulties with meeting traditional requirements. For example, students complain that they have to do 'pen practice' to be able to undertake certain tests (this is also the case at MLC). Teachers are critical of some of the contact hour requirements in the curriculum, as online students can 'get through' so much more material, so much more quickly. There is also considerable dissatisfaction with some of the national testing methodologies and rationales. It is also the case that standardised and national tests do not reveal or measure the strengths of the school, the extent of the new learning, the achievements of the staff or the successes of the students.

A major difficulty faced by the staff is the pressure to provide sufficient digital resources. As the entire school works through an integrated curriculum it is possible for staff teams to share the task of resource making and to make digital objects available to all learners. But greater resources are needed to achieve such ends. Teachers are not professional digital content creators and should not be expected to become so. Rather there is a pressing need for a digital repository of reusable learning objects, which could be accessible to all educational professionals, nationally and internationally.

More expertise and time are required to handle intellectual property (IP) requirements. Managing the digital resources and requirements for well over 1,000 active knowledge makers would be a full time job and it could be that a digital rights and business manager is a logical addition to the staff.

While staff obviously work extremely hard, they are not engaged in some of the horrendously time consuming and mind deadening chores of old. Teachers are not taken out of class for weeks on end to 'do the timetable', nor are they required every forty minutes to marshal hundreds of students between classrooms. They don't even have countless monotonously repetitive essays and exam papers to take home and mark (though their record keeping of student achievement in knowledge making was inspiring and comprehensive) (refer 'Chapter Ten: e-Teachers Know How' for discussion on assessment).

## **Professional Development**

One of the most impressive features of Woodcrest College is its commitment to professional development. Professional development has been actively sought by all members of staff so that every second staff meeting is given over entirely to professional development. Woodcrest staff are also constantly trying to find e-learning specialists who might be able to serve as guides and mentors.

At all the conferences and workshops which staff attend, they are in demand to give presentations and they are very keen to have presentations made to them.

Every year, all the staff have a professional development conference at a major resort. Not only does the entire staff attend the retreat – including secretaries, grounds people, etc – but the costs are raised throughout the year by all staff members. In 2001, it was held at Twin Waters and the topic for the conference was ‘Values, hopes and fears for Woodcrest College’. The conference aimed to outline the role of schools in the future – from both a global and local perspective. The conference was focussed around the question, ‘How can Woodcrest College meet the demands for staff and students in the twenty-first century?’.

The wired community, and Woodcrest’s contribution to Community Net, provides the school with an excellent communication resource. Parents have access to school information and activities – and student progress. School links with the overall community are well served. There are excellent links with the business community and with all manner of ongoing community activities. While there are positive reports as to the value of a wired community with the school at the centre, a systematic evaluation of the impact would be very useful.

## **Student Life: ‘We’re in charge here!’**

Asked what they liked most about the way their school was organised, two eight-year-olds commented, ‘We’re in charge here!’

There is every chance that a disproportionate number of Woodcrest College students will be recognised knowledge makers in the future. For even the eight-year-olds are engaged in the conscious process of thinking up knowledge products and making them while in school.

This is a context in which there is no timetable, no set text books (and a conscious effort to move towards a paperless school), where all classes have their own room and two class teachers (with some specialists coming in when required) and where there are no subject divisions but an integrated curriculum.

Students and teachers work as individuals and teams as they make their ‘quality knowledge products’. There is no centre of the classroom, no rows of desks, or blackboard, but groups of students sitting at computers, talking, consulting and clearly very engrossed.

Asked by a visitor to the school whether the model of a house she had made was her knowledge product, an eight-year-old responded, ‘Of course not! It’s a house! This is my knowledge product’, and she turned to her computer to show how the house has been turned into a revolving 3D animation of the sort of house you would need in an earthquake area.

This isn't someone who is simply learning about earthquakes. This is a knowledge maker who is putting together a number of resources (or learning objects) to solve the problem of housing in an earthquake zone. She is coming up with something new – something that wasn't known when the lesson began. Something that is innovative and has to be evaluated in its own terms and not against the 'correct answer'.

The same activities are being undertaken throughout the school. There are eleven-year-olds who are editing a video and using the most sophisticated tools to synchronise the text and the music. Still others are creating menus for a restaurant, while some are writing 'movie scripts'.

Students work at their own pace and without a set timetable. They work on their projects until they are satisfied with them. Many even have their lunch at their computers (as past generations have eaten while they read their books!)

Clearly this is e-learning for the twenty-first century.

chapter ten  
e-teachers know how

## Introduction

Teachers are in the middle of an educational revolution. The challenges which are emerging are almost incomprehensible. Some of the major issues to emerge are associated with:

- How to restructure the education system;
- How to rethink the profession of teaching and the nature of learning;
- How to resource educational professionals to meet these varied and unprecedented demands; and
- How to ensure that teachers are able to keep up with these far reaching and ongoing changes.

The time has passed when technology could be regarded as an 'add-on', a computer lab, where students went for weekly lessons or for school information presented online. The new technologies are about much more than using the Internet as a teaching tool, they are now integral to teaching and learning as examples such as Woodcrest College make clear.

The digital medium is transforming every facet of the process, from classroom organisation, to the way students think and produce knowledge work, to the new skills base that every educational professional must acquire.

So every responsible teacher is now asking...

- What does the digital medium now allow me to do that teachers and education have never been able to do before?
- How should this new learning enterprise be shaped to best meet the interests of teachers, students, parents, policy makers, the community and the nation?

This means that the profession must take a critical look at the education system, assess the changes that are underway and initiate strategies to ensure that a viable and resourcing educational enterprise is developed for the future.

Where to start? The following factors need to be kept in mind.

## The digital classroom

The digital classroom is a global concept where technology is infused into the learning process and where learning is customised, ongoing and not confined to the four walls of the classroom.

In a digital classroom learning is an interactive process where there is ongoing feedback and reconfiguration as learners engage in knowledge making.

Where regimentation (like that in the classrooms that we have known) is a thing of the past – where it is no longer an assembly line process, a 'one-size-fits-all' model, but where individuals work at their own pace – in collaboration with others (teachers among them).

Where it could be common to find multi-aged groupings – where there is a shift away from structured year groups, so students of different of ages can find effective ways of working on the same project. Peer –to-peer learning occurs horizontally – when students are at the same learning stage and can learn from each other. Peer-to-peer learning occurs vertically – with less advanced students able to learn from older and sometimes younger counterparts. (And these groupings may not correspond to the old ones based on age; indeed it is possible that the school could cater for all age groups – parents and community numbering among their learners.)

Where ‘authority’ – such as one voice, or one version, or one solution – is questioned, and this includes teachers as well – so that they cease to be the sage on the stage and become more of the guide on the side. Teachers will also be learners.

Where the educational content is project based, rather than subject oriented; focussed on learning objectives for individual students, rather than the coverage of a body of information.

Where the emphasis has moved from what students have memorised to what they can do with information – which is why digital classrooms are active and noisy.

Teachers who communicate with students online can respond more to individuals, as they don’t have to take into account the demands of the physical classroom; all students can enjoy equal teacher attention, rather than the teacher having to respond to the most disruptive or demanding.

## **Digital content**

Teachers don’t have to be the authorities – they don’t have to know everything any more. Which is just as well – for there is too much content, and it changes too quickly for teachers to keep up. An effective teacher will now be much more likely to provide pointers to information, rather than the information itself. (This does not mean that content is irrelevant or that content experts are being displaced; but it does mean that teachers don’t have to know it, they don’t have to keep the content in their heads. They have to know where to find it, and how to recommend it, so that others can use it.)

Teachers are not professional digital content producers – although they can improvise – so they need access to a rich digital library – to a digital repository full of world class learning objects – which they can point to, package, present to their students, who will use the content to make their own knowledge products.

The shelf life of content is so short and the demand by students for content is so great, that finding and licensing, and buying and selling digital content (as schools once bought and distributed text books) is a specialised activity that calls for a new form of learning business manager.

## **The digital learner**

Digital learners are 'in charge' of their own learning – which is self directed and self paced; but such self management does not just emerge – it has to be facilitated; learners need to be skilled in learning responsibility and in making their own knowledge; this is what many professional educators are referring to as the new basics, the new skills which are displacing the old standardised skills and roles.

Because they are in charge, digital learners move through content immeasurably more quickly than those who were dependent on the stable, and one-way information, which came from the teacher or the text book.

Digital learners also have the advantage of being part of an inclusive activity – because they can learn at their own pace, no one gets left behind; no one has to wait until others are finished. Those who learn quickly can choose to make more complex products and to come up with more solutions (as do the students at MLC for example).

Online learners can be upfront and visible – or else they can be more reticent and reflective; for students there are advantages when it comes to being in charge of participation – particularly for those who may be shy in face to face classroom discussion.

## **Talk as the means of digital production**

In a knowledge economy, talk is the means of production – it's the way that ideas are formed, shaped, refined, elaborated and turned into potential knowledge products – so talk has to be the basis of learning and knowledge making; learners have to be able to talk to each other all the time. (This has implications for classroom organisation – and for acoustics!)

This calls for a very different classroom dynamic from the text based classroom where reading and writing have demanded silence and isolation – and where it was customary to hear the injunction 'Be quiet and get on with your work'.

Such talk can be conducted face-to-face – or online – with video-conferencing/streaming, as well as 'chat', becoming much more common; and if there are positives in relation to face-to-face communication, this is not a reason for ignoring the online medium – it is a challenge to determine what they are and to incorporate them in the online format.

Much of the school work of the traditional system was undertaken in isolation and was not to be shared with others; Do your own work; no copying or cheating! While this may have been adequate in a 'one way' process, the transfer of information from teacher to student, it is not helpful in a knowledge making context – where two heads are so often better than one, and where collaboration, team work, talking and sharing – are to be encouraged.

## **Learning and earning**

Because learning and earning are once more being integrated, less status will be given to academic bodies of knowledge, to 'educational content', and more to application and know-how.

As ideas are not age bound, and as many of today's net generation are already selling their knowledge skills, and turning their ideas into knowledge products (and according to Don Tapscott, author of 'Growing Up Digital', are more likely to be setting up commercial web pages than mowing lawns or baby-sitting), the learning/earning culture of educational institutions is changing. (More and more VET courses are being introduced.) So students may want more entrepreneurial skills rather than conformist, or 'fit in' ones which have been favoured in the past.

One way of linking the learning and earning is by developing Community Service and Community Projects – which encourages today's learners to use technology to communicate with out-of-school community groups and interest groups; and business groups — thereby providing real world experience.

Given that most of the work young people will do hasn't been invented yet – and will change when it is – teaching students to learn how to earn as an individual, is a priority which should be high on the list.

### **Parents of the digital generation**

Parents want the best possible education and life chances for their children.

Many of today's parents are confused and anxious about the future – and can fall back on what they know and what it was like when they were in school – and it is understandable if they want more regimentation rather than this new flexibility (which can look like anarchy to many).

They are often uneasy about the decline in the value placed on memorisation — and feel more comfortable with the more tangible test results that purported to measure content retention and recall.

Parents are therefore new learners in the same way that teachers and students also have to make the transition to the digital age – and it is clear that the e-teacher needs to educate parents in relation to the digital classroom; once they appreciate that a digital learning environment is necessary preparation for life in the digital age, parents can become the schools' greatest ally and can support claims for reform, funding and training etc.

### **Assessment**

Performance Outcomes – In the old system a successful outcome was defined as a high test score; a situation where – generally — no new knowledge was created. (This is in contrast to a PhD for example, the highest academic award, where there has been the requirement for 'original' or new knowledge.) In the new system, new knowledge, or a knowledge product is created – as the outcome of learning and it should be part of the experience of all students.

The outcome is also more likely to be based upon collaboration, be multimedia in format and be creative in subject area and scope. Which demands different forms of assessment.

Much of the value of assessment in the past has been its potential for standardisation – so that there has been a 'standard' against which learners have been ranked. Students have been 'quality controlled on the assembly line' across grades, classes, schools and by means of standardised tests and examinations etc.

Trying to provide a standardised delivery – the same content in the same way for the same amount of time to students of the same age — has its limitations in an education system which seeks to develop the human capital/potential and creativity of every individual learner.

Assessment has also been focussed on content and memorisation – a feat which has become increasingly difficult as more and more content is created and as it lasts for a shorter and shorter period of time, so the test is not what a learner can recall but what a learner can find – and how that information can be used.

‘Know How’ or competency – or what learners can DO (as distinct for what they know) is the hallmark of the new learning. And much of this assessment can be done online.

Take air pilots for example, much of their training is undertaken in a flight simulator – the most sophisticated form of online assessment – where they are required to complete so many ‘safe’ landings. Having done so – they are not asked to memorise the information and to do a written test – though they may well be required to do a refresher course in the not so distant future, as the technology again changes!

The ability to think critically, to evaluate, to make decisions, to be creative and lateral and to come up with new (and workable) solutions is more important now in a knowledge economy, than it has ever been. The challenge is to devise new and better ways of assessing these skills (which may continue to change) and for this we need educational professionals to think critically, to evaluate, to make decisions – to be creative and lateral and come up with new and workable solutions.

Simulations and Virtual performances might be the basis of the solution; for example, they can complement and even replace expensive and time-costly class-based field trips.

## **Futures**

Preparing students for an unpredictable world will take, above all things, vision. Inherent in this vision are several key realisations: that we are working to prepare a new kind of student; that we are using brand new tools, for a life that we cannot clearly see, anticipate or describe today; that embedded in this challenge are fantastic opportunities; and that teaching should and could be the most exciting profession on the planet (Warlick, 2001).

## **Behaviour**

Most educational authorities express concern about the increased disruption in the classroom. One explanation for these behavioural problems is that the traditional, ordered and regimented framework of the school is ‘out of sync’ with the culture of the net generation – which is more about movement, connectivity and change. And that far from being aggressive and lacking concentration – the interpretation that can be placed on the behaviour of the net generation, who are not inclined to sit still and be quiet, but who talk, stretch, lunge and get excited — today’s students may simply be the product of a different information medium, a different way of making sense of the world, a different value system.

It is interesting (and ironic) to note that one experimental school designed to deal with students who disrupt classrooms, has only the minimal number of rules; that the students contract to do specific knowledge tasks. They can do them in their own time, at their own pace and in their own space; there are no timetables, classes, set exercises etc. The evidence suggests that the experiment is working well. (I wonder why there isn't competition for the places.)

Much of the perceived disruptive behaviour of boys can also be linked to their computer culture and skills. Frequently, the very skills that could lead to good jobs outside the educational institution – which are associated with the quick response, competitive ethos and determination of the computer games culture – are seen as inappropriate and even a 'deficiency' in a traditional classroom. If e-teachers could harness computer games for educational purposes (and the technology is much the same, but just a bit different purpose and content), then instead of poor performances in school, we could find that the know-how and competency profiles of boys improved to register as very impressive.

Increased Motivation – When students 'own' their learning, motivation and a sense of personal investment are also increased.

## **Skills**

The skills that the e-teacher needs are mind boggling – and the question is where to begin? Teachers are among those who have to quickly become the new learners, in order to be the leaders in this vital enterprise.

Yet one of the major obstacles to taking on the new is that of getting rid of the old. Which is why so many e-learning commentators emphasis the importance of unlearning.

## **Unlearning**

The challenge for teachers says Ohler (2001) is to shed 'old information unsentimentally [while] grasping and absorbing new information, and being able to apply it quickly to new situations'. You can be a 'find-it-all' or a 'facilitate-your-students-to-find-it-all,' but you can't be the know-it-all.

An education revolution means just that; it means that most of what was relevant, most of what worked, most of what was valued before the revolution isn't applicable afterwards. And there is a need for a well informed debate on what might be kept and what needs to go.

## **Learning and technology**

Teachers have been reared with print; many of today's teachers are not just literate – they have enjoyed a passion and enthusiasm for books and content. But as we move into the screen/digital age it is not just a matter of being computer competent – but of being good with the new technologies, of being imaginative in the way we use them. Even of being passionate and enthusiastic about the new opportunities they afford.

(Too many of the current problems in school can be traced to the inability of text-teachers to become good e-teachers.)

## Technology training and professional development

It is now widely acknowledged that teachers need much more than a laptop of their own if they are to successfully engage in e-learning. Teachers must also benefit from expert advice about software, as well as specific training about how best to use it. Most of all, teachers need to be alerted to the outcomes that can be achieved, when technology 'infuses' learning and teaching practice. But why are these important needs?

Available research suggests that technology-focused professional development (PD) initiatives have a direct impact upon the confidence and competence of teachers. Indeed, this type of PD is particularly effective when:

- technology is integrated into initiatives;
- there is a positive attitude to technology from within a school;
- management is enthusiastic with short feedback loops;
- technology training is supported within strategic planning;
- identified needs are matched against expected outcomes; and
- when training is tailored to be relevant to a phase, subject or context (*New Opportunities Fund Report ICT Training for Teachers and School Librarians, 2001*).

## Effective professional development: Information technology approaches

One innovative approach that deserves mention is that of Melbourne school Methodist Ladies College (MLC). For MLC teachers, peer-to-peer learning has proven to be highly effective.

A tradition of several years standing, teachers at MLC regularly participate in informal Pizza and PD nights. On Wednesday evenings, and with refreshments at hand, groups of staff come together to learn new software skills and new ways of 'infusing' learning with technology.

Spurred on by fellow teachers, these nights have high attendance rates and have been invaluable in sharing knowledge and skills at all levels at the school. Hands-on, collaborative PD of this nature, can be both popular and effective.

## The importance of time out

A second key factor in effective PD is teacher time-out. In this respect, schools that allow teachers time-out to experiment with new equipment not only find their staff 'better prepared' to integrate technology into classroom lessons, but they are also more likely to use and rely on digital content for instruction (Ohler, 2001).

Time-out is crucial at this stage of the education revolution when teachers have to manage so much change with so few established resources.

There are few PD courses, few gurus or mentors or precedents to guide them. There are few learning models, few guidelines on how students learn in the digital environment and the consequence is that – e-teachers must make their own knowledge in all these areas as they go. (And it takes more time to make these new products.)

The digital content just isn't there at their fingertips; too often they have to make it themselves; there isn't a ready made digital library which has all they need. Time out allows teachers to try out software and search for websites and other resources to use in class. The time is also valuable for teachers who are committed to devising new project-based learning initiatives for their students.

And it is common for teachers to have to teach the old as they 'add on' the new; which is a bit like having to do two jobs – and one of the reasons the entire profession feels so overburdened.

Technology and training will allow educationalists to deliver learning riches that would not have been possible in earlier ages. But at the moment the pressures are enormous. The solution will be the emergence of well resourced and savvy teachers, whose understanding and creative use of technology helps them achieve undreamed of levels of excellence for themselves and for their students.

### **Theory and practice**

Teachers are the ones who need to define the skills base of the profession in the digital age. e-Teachers will want to discuss, debate and articulate the skills for their profession in the same way that they will want to develop a framework for their students.

How to move from being the expert, the authority, the transmitter and tester of information – to the resourcer and facilitator – is a shift which demands a great deal of professional development and understanding. It will take much to dislodge the traditional mindset about the role of students and instead to view them as customers/clients. (And it must be acknowledged that there will be those who don't want to make the transition.)

What can be claimed with certainty is that the profession must come up with the strategies for implementing the change – and seek the resources to put such change into practice. Grievances are not enough; new solutions have to be found.

### **Raising the profile of teaching**

In the new knowledge society, it is often said that there can be no more exciting or significant profession than that of teaching. Education is now central to the prosperity of society and teachers can be among the most important of the professionals.

### **Convergence**

e-Teachers will not just have to get used to the idea of supporting students, of meeting their demands, (a reversal of roles in some circumstances); it won't just be a matter of trying to adjust to the idea that new learners can enrol any time of the day – for the rest of the teacher's working life! Teachers will also have to rethink the relationship between the various graded education institutions.

Even in the bricks and mortar educational institutions the lines are already becoming blurred.

There are Vocational Education Training (VET) courses in schools, and school students doing university courses. TAFE and universities are contesting the post school qualifications. And no one institution is taking responsibility for teaching and learning in the biggest group of all – the over 25s.

Online the boundaries are even more blurred. To the students who are trying to work out what to do about homelessness and how to solve the problems of salinity, it will not matter whether their digital learning objects (which can include interviews with the world's experts etc) originate in a school, a college, a university or a private company – or whether they are Australian or from overseas.

And if people are classified according to the learning needs, (rather than their ages), there won't be the ordered move up through the institutions from school, to college, university etc.

Perhaps educational institutions will differentiate themselves on the basis of the services they offer clients rather than on the content they have organised hierarchically for schools, colleges, universities etc. So a school might be a learning place which caters for every member of society (if they so choose) but which specialises in support, planning, monitoring etc – along with team building skills (such as those developed in drama, debating, music, sport, etc.)

TAFE colleges might specialise in 'hands-on' for every member of the community who wants to enrol.

The services provided by the university would be just as sophisticated but would be catering for the most independent and resource hungry students – and which might be the home for many of the computer-expert boys who can find the school classroom restrictive.

Private providers might provide the fast track customer services; there is no end to the possibilities. And these are not science fiction scenarios – but realistic possibilities and they need to be addressed by e-teachers if we are to develop a policy for the role of the school, the students and the e-teacher, in the new digital environment and knowledge economy.

overview  
trends for the next five years

## Introduction

As Australia becomes a knowledge society, our education system is experiencing significant change. In the industrial age, mass produced education may have been sufficient, but the knowledge age demands that each member of society develop their own unique creative potential throughout their lives and this means we have to come up with a very different education system.

When the most valuable product is knowledge – and when people's ability to participate in society is dependent upon the quality of their ideas, rather than physical labour – it is easy to see learning's new importance.

The pressure of change is great. Everyone from Chief Executive Officers, to computer programmers, to policy makers are trying to anticipate the next generation of technology products and how to accommodate all the changes. The future, and predictions about it, is now assuming much more importance than it did in the past. What's going to happen? Will it stop? When will we have arrived as a digital society?

In this context, it is important that we try to anticipate the future trends. It is the only way we can plan an education system.

## Learning

Future expectations for learning are directly related to the shift to online. Every day there are new statistics about the take up and the implications.

For example, a recent study of students at Harvard University found that most undergraduates are already spending more time on the Internet than they spend socialising on campus or even sleeping. (This was made much of on ABC News Radio in Net News).

The ability to learn anywhere and at anytime will also have implications for how students learn. In this respect, learning will become increasingly 'student-centred'. Project-based learning will be absolutely central to this shift, as it is precisely this type of learning that allows students to 'be in charge'.

At the same time as the student takes centre stage, so the need for interaction with tutors and peers will increase. Far from replacing the teacher, online learning is more likely to mean a changed, but not necessarily reduced role. It is certainly possible that more teachers will be needed for more of the time when more people want to learn. They will just be delivering different services from those that have characterised classroom and print based teaching in the past.

The third major trend will see learning linked increasingly with earning. For students, there will be greater interest in Vocational Educational Training subjects, particularly at the higher levels in secondary schools.

This may mean a dramatic transformation of educational organisation. It may not just be that schools, colleges and universities converge, but that the boundaries between learning (in education institutions) and earning (in the workplace) might also blur so that learning is truly outside the classroom.

As the US futurist Stan Davis has said, it is the workplace, rather than institutions, that has becoming the new centre for learning (Davis and Meyer, 2000).

### **Schools administration and governance**

A second area that is set to undergo marked change relates to the governance of schools. In this respect, schools in Australia are likely to become increasingly autonomous from education departments. This is especially the case as school communities take responsibility for school services.

Indeed, in the UK, the self-governance of schools is a policy priority. This focus includes schools having a greater say in the way the curriculum is administered, how standards are defined and achieved.

The growing charter schools movement in the US shows a similar trend where entire communities are active in establishing the way their local schools are operated.

Associated with the growing independence of schools – public and private – is innovation. Encouraging autonomy at school level is a way of creating opportunities for schools to excel and innovate. In the words of the UK's Schools Achieving Success report, independence opens 'secondary education to a new era of engagement with the worlds of enterprise, higher education and civic responsibility'.

### **Teachers**

One of the most significant changes is that of the transformation of the teacher or the education professional. No longer the 'talking head at the front of the classroom', Arthur Levine of Columbia Teachers College explains that the teacher will become a resource, guide and mentor, instead of the content expert.

Teachers will also be as adept technologically as they were with books. They will use the new technologies to the full to engage and empower students who might be of any age, or come from any background, or any geographical location.

Along with the changes in the ways schools are governed could well come changed conditions of employment. Teachers may be more likely to contract themselves to a school – or several schools – than be employed in a traditional teaching job. This development will mean that teachers set their own rates with their client schools. Some suggest that this will raise the status of the profession, as schools undertake bidding wars on teaching talent.

### **Curriculum**

Along with the shift to student-centred learning is the replacement of the one-size-fits-all attitude to education. There is growing recognition that students interests and aptitudes vary, that their learning styles and needs are different and that this creates a demand for a new approach to curriculum and testing. According to Ohler, the new curriculum must be 'relevant and built on intelligence, insight and conviction' (Ohler, 2001).

To date, project-based learning offers the clearest indication of the future direction of curriculum. This is because in project learning, the curriculum tends to be implicit in students' learning.

For students, this type of approach often means a greater level of engagement as student interests direct the learning and student motivation can play a positive part.

### **School buildings**

With the trend towards anytime, anywhere learning, school buildings are also likely to undergo change. While the 'shell' of a building is predicted to remain – at least in the foreseeable future – what is expected to change is the internal arrangements of rooms, space, resources, finish and furniture. (See examples of Woodcrest College Chapter Nine: Case Study 2).

According to Tony Richardson of the National College for School Leadership in London, the outside shell of a school building currently has a life of 50–60 years. A school's interior however, has a life of only five – eight years. Richardson says that just as the layout and operations of factories and offices have changed in order that the work environment matches the functionality needed, so too will schools experience similar change (Richardson, 2001).

### **Public and private partnerships and community links**

One of the most important changes to affect schools will be the advent of public and private partnerships and stronger community links. Already major priorities in the UK and the US, these partnerships in Australia may range from the development of digital content, to working together to ensure that school communities are networked.

At Minnesota New Country School (MNCS) in the US for example, the idea of community is absolutely central. In this respect, MNCS contracts its building from a local landlord. A local restaurant provides lunch, the school district provides transport and extra curricular activities and the Cooperative provides the professional staff.

Partnerships of this nature, where the private sector is invited to contribute to the social good of schooling are likely to be a prominent feature of the future of Australian schooling.

### **Schools' collaboration**

The need for students to have access to the best information and the latest technology are two factors that are expected to drive collaboration among schools and even among states. It is obviously much more economical in terms of both technology and teacher skills for schools and systems to combine resources. Perhaps we will see the beginning of global school systems with shared resources.

Such collaboration, however, will be juxtaposed against schools operating within a competitive environment. According to Arthur Levine of Columbia Teachers College, competition between schools could generate quality in education.

## Image of schools

Increasingly, the public's perception of our schools will be defined by websites. This will venture on to classrooms, special programs, samples of student work and other aspects of teaching and learning. According to David Warlick, this image will eventually become the model for schooling (Warlick, 2001).

## Assessment methods

*'It's difficult to determine what accountability should look like. However, I believe that if I were still teaching social studies, the best service that I could provide my students would be to take them to the media centre for tests. I would encourage them to use any books, magazines, computer software, or the Internet to answer the questions on the test. If students demonstrate the ability to teach themselves, then we have prepared them for an unpredictable future.'*

*(Warlick, 2001)*

The shift away from the rote learning approach of old and towards customisation in learning – and e-learning – means that assessment methods are in need of significant change. While few educationalists are sure of the best methods for a knowledge society, what they are sure of is that old ways hold little relevance.

In attempting to provide an alternative way of thinking, Ohler concludes 'My advice to those seeking assessment solutions: spend your money figuring out your goals; then spend what is left over on assessment' (Ohler, 2001).

For Australian education, this innovative standpoint deserves serious consideration.

## Conclusion

The future of education is nothing less than exciting. When the new possibilities presented by e-learning are considered alongside the trend towards greater school-community links, school learning in the coming years stands to be fruitful, innovative and above all rewarding for teachers and learners.

Yet the future will not occur on its own. Indeed it will not even occur if things are left as they currently are. Rather, the future needs to be created with a good dose of vision and conviction that these new goals are worth achieving. While this commitment will need to be driven by those at the top, most of all it demands support from all.

references

Adelaide Declaration on National Goals for Schooling in the Twenty-First Century (1999) at:  
[www.curriculum.edu.au/mceetya/nationalgoals/natgoals.htm](http://www.curriculum.edu.au/mceetya/nationalgoals/natgoals.htm)

Australian Department of Education Training and Employment (1998) Strategic Plan 1999 – 2002 World Class Education, Training, Childcare, Employment and Youth Services at:  
[www.tsof.edu.au/LT.SA/decstech/strategic\\_plan.htm](http://www.tsof.edu.au/LT.SA/decstech/strategic_plan.htm).

Ball, M. (2001) For an Online High School the Future Draws near state e-learning Project could ease Teacher Shortage, Expand Curriculum, Washington Post, August 22 at:  
[www.washingtonpost.com/wp-dyn/articles/A47115-2001\\_Aug22.html](http://www.washingtonpost.com/wp-dyn/articles/A47115-2001_Aug22.html)

BECTA (2001) Information Sheet on Hand Held Computers, July at:  
[www.becta.org.uk/technology/infosheets/pdf/handheld.pdf](http://www.becta.org.uk/technology/infosheets/pdf/handheld.pdf)

Borough of Lewisham Education (2001) T@lent ICT Training for Teachers at:  
[www.ecs.lewisham.gov.uk/talent/pricor/early\\_years.html#ICTenhancing](http://www.ecs.lewisham.gov.uk/talent/pricor/early_years.html#ICTenhancing)

Brock, Thomas (2001) The Challenge moving into the 21st Century with Technology at:  
[www.intel.com/education/teachtech/classroom/casestudies/abc\\_case\\_study.htm](http://www.intel.com/education/teachtech/classroom/casestudies/abc_case_study.htm)

Cant, S. (2001) Cash-strapped Navigators lose their momentum, The Age IT, June 12 at: [www.it.mycareer.com.au/news/2001/06/12/FFXJMWUONC.html](http://www.it.mycareer.com.au/news/2001/06/12/FFXJMWUONC.html)

Carroll, Tom (2001) Converge magazine, July

Centre for Education Reform (2001) Charter Schools: Changing the Face of American Education at:  
[edreform.com/charter\\_schools/today/index.html](http://edreform.com/charter_schools/today/index.html)

Chandrasekaran, A. (2001) Edison Schools executives, Reuters Business Report, July 6.

Connecting the Learning Society: The Government's consultation paper on the National Grid for Learning (1997) Department of Education and Skills at: [www.dfes.gov.uk/grid/consult/index.htm](http://www.dfes.gov.uk/grid/consult/index.htm)

Corson, R. (1998) Le Sueur-Henderson Minnesota New Country School The American Prospect Online at: [www.prospect.org/print/V9/39/corson-r.html](http://www.prospect.org/print/V9/39/corson-r.html)

Credit Suisse First Boston (2001) Education and e-learning Weekly, January 29.

Davis, Stan and Meyer, Christopher (2000), Future Wealth, Harvard Business School, Boston, Massachusetts.

Department for Education and Skills (2001) Digital TV and the Internet to Help Pupils Tackle Pythagoras and Boost GCSE Standards – Blunkett, April at:  
[www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0190](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0190)

Department for Education and Skills (2001) Ministers Encourage More Girls to Get Techie with Computer Clubs, April 18 at: [www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0200](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0200)

Department for Education and Skills (2001) £25m to Develop and Retain Next Generation of Teachers – Timms, September 3 at: [www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0333](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0333)

Department for Education and Skills (2001) Virtually All Schools are Now Connected to the Internet – Ashton, September 4 at: [www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0334](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0334)

Department for Employment and Skills (2001) On the path to E-Government – Council pathfinders picked, March 22 at: [www.press.detr.gov.uk/0103/0164.htm](http://www.press.detr.gov.uk/0103/0164.htm)

Department for Employment and Skills (2001) Jacqui Smith Announces £10 Million Lift Off for Classroom of the Future, February 5 at: [www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0062](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0062)

Department for Employment and Skills (2001) £11 Million for e-Registration will Help Tackle Truancy: Jackie Smith, March 26 at: [www.dfes.gov.uk/pns/DisplayPN.cgi?pn\\_id=2001\\_0167](http://www.dfes.gov.uk/pns/DisplayPN.cgi?pn_id=2001_0167)

Department of Education and Training (2001) Building the Future Consultation Report at: [www.det.nsw.edu.au/papers/future/buildingthefuture.htm](http://www.det.nsw.edu.au/papers/future/buildingthefuture.htm)

'Distinguished Educators, Policymakers Explore Teacher Quality Excellence at Milken National Education Conference' June, 2001 at: [www.mff.org/newsroom/news.taf?page=198](http://www.mff.org/newsroom/news.taf?page=198)

Education Week (1999) Technology Counts, September 23.

Falling Through the Net A Report on America's Access to Technology Tools (2000) US Department of Commerce, October at: [search.ntia.doc.gov/pdf/fttn00.pdf](http://search.ntia.doc.gov/pdf/fttn00.pdf)

Fatemi, E. (1999) Building the Digital Curriculum: Summary. Technology Counts 99 Building the Digital Curriculum, September 23 at: [www.edweek.org/sreports/tc99/articles/summary.htm](http://www.edweek.org/sreports/tc99/articles/summary.htm)

Fisher, C. (June 1 2001) 'Full Toolbox', tech Learning at: [www.techlearning.com/db\\_area/archives/WCE/archives/cfisher.html](http://www.techlearning.com/db_area/archives/WCE/archives/cfisher.html)

'For-Profits and the Charter School Movement: Trends and Prospects' (2000) Panel discussion with: Howard Block, Richard Elmore, Kate Merseth and Steve Wilson, Harvard University Center for Business and Government at: [www.ksg.harvard.edu/cbg/profitcharters.html](http://www.ksg.harvard.edu/cbg/profitcharters.html)

For Profit Schools (2000) Business Week, February 2, pp 64.

Fromm, J. and Kern T. (2000) Making a Profit while Making a Difference, Journal of Private Equity, Fall.

Fromm, J. and Kern, T. (2001) 'Education Industry Offers World of Investment Opportunity'. Venture Capital Journal, March.

Fujimoto, E. T. (2001) Putting a Price on our Children. Converge Magazine, July at:  
[www.convergemag.com/magazine/story.phtml?id=253000000002745](http://www.convergemag.com/magazine/story.phtml?id=253000000002745)

Garrison, J. (2001) Computers Are Elementary for Laptop Kids of Ladera Ranch, LA Times, September 7 at: [www.latimes.com/editions/orange/la-000072361sep07.story?coll=la%2Deditions%2Dorange](http://www.latimes.com/editions/orange/la-000072361sep07.story?coll=la%2Deditions%2Dorange)

Graham, J. and Martin R. (1998) Teachers Schools and the New Technologies. Australian Education Union, Southbank.

Hellaby, D. (2001) Royalty Sharing on Table AustralianIT, October 2, page 3.

Hoff, D. (1999) Digital Content And the Curriculum, Technology Counts 99 Building the Digital Curriculum, September 23 at: [www.edweek.org/sreports/tc99/articles/curr.htm](http://www.edweek.org/sreports/tc99/articles/curr.htm)

ICT in UK Schools: 2000 Edition (2001) British Educational Suppliers Association at:  
[www.besonet.org.uk/news/downloads/ict2000.pdf](http://www.besonet.org.uk/news/downloads/ict2000.pdf)

Interview with David Warlick (June 15 2001) at:  
[www.techlearning.com/db\\_area/archives/TL/200106/conversation2.html](http://www.techlearning.com/db_area/archives/TL/200106/conversation2.html)

Interview with Jason Ohler (June 15, 2001) at:  
[www.techlearning.com/db\\_area/archives/TL/200106/conversation3.html](http://www.techlearning.com/db_area/archives/TL/200106/conversation3.html)

Isaac, C. & Brown, A. (2001) Global SchoolNet 2001, Continues to Grow, July 7 at:  
[tesco.schoolnet2000.com/news\\_p.html/archive/715](http://tesco.schoolnet2000.com/news_p.html/archive/715)

KPMG Consulting LP (2000) Evaluation of the SchoolNet1 Initiative Final Report at:  
[schoolnet.ca/home/e/documents/SN\\_evaluationE.pdf](http://schoolnet.ca/home/e/documents/SN_evaluationE.pdf)

Lawrence-Lightfoot, S. (2000) 'Interview Unit of One' Fast Company, November at:  
[www.fastcompany.com/online/39/one.html](http://www.fastcompany.com/online/39/one.html)

[www.childrensprogress.com/levtimes.htm](http://www.childrensprogress.com/levtimes.htm)

Leadbeater, Charles (1999) Living on Thin Air, Penguin p IX.

Leadbeater, Charles (1999) Living on Thin Air, Penguin p9.

Leadbeater, Charles (2000) Delia Smith not Adam Smith, Chapter 3 (refer for further discussion about recipes)

Lewin, T. (2001) 'Children's Computer Use Grows, but Gaps Persist, Study Says', New York Times, January 22, at: [www.nytimes.com/2001/01/22/technology/22COMP.html](http://www.nytimes.com/2001/01/22/technology/22COMP.html)

Light, J. (2001) 'Editorial' CorpWatch at: [www.corpwatch.org/trac/feature/education/](http://www.corpwatch.org/trac/feature/education/)

Lingard, B., Ladwig, J. Mills, M. Bahr, M., Chant, D. and Warry, M. (2001) School Reform Longitudinal Study Final Report Volumes 1 & 2 Submitted to Education Queensland by School of Education, University of Queensland.

London Borough of Redbridge (2001) National Grid for Learning Achievements, 2000-2001 at: [www.redbridgeschools.net/seminar%20report%2012.pdf](http://www.redbridgeschools.net/seminar%20report%2012.pdf)

Mann, C. and Stewart, F. (2000) Internet Communication and Qualitative Research. A handbook for researching online. London, Sage.

Market Data Retrieval (1999) Technology in Education, Shelton, CN at: [interact.hpcnet.org/webcommission/content.doc](http://interact.hpcnet.org/webcommission/content.doc)

Mathews, J. (2001) Students Embrace Technology, Washington Post, June 5 at: [www.washtech.com/news/media/10260-1.html](http://www.washtech.com/news/media/10260-1.html)

McConnaughey, James; Everette, Douglas, W; Reynolds, Taylor; and Lader, Wendy (2000) Falling through the Net  
Merrill Lynch & Company (1999) The Book of Knowledge, April.

Moyer, K. (2001) Where Technology Use is Second Nature, Converge Magazine, February at: [www.convergemag.com/Publications/CNVGFeb01/story.phtml?id=253000000001032](http://www.convergemag.com/Publications/CNVGFeb01/story.phtml?id=253000000001032)

Moyer, K (2001) Where Technology use is second nature, Converge magazine, February at: [www.convergemag.com/Publications/CNVG/Feb01/story.phtml?](http://www.convergemag.com/Publications/CNVG/Feb01/story.phtml?)

Murdoch, Rupert (2001) Keith Murdoch Memorial Oration, October 11, Melbourne.

National Center for Education Statistics (2001) Internet Access in U.S. Public Schools and Classrooms: 1994-2000 at: [nces.ed.gov/pubs2001/internet](http://nces.ed.gov/pubs2001/internet)

Nelson B. Heller & Associates (2001) School Path to Offer Schools Web Tools and Content on a Wireless Device. Reprinted from: Internet Strategies for Education Markets: The Heller Report at: [www.yfactor.com/news-views-10-schoolpath.html](http://www.yfactor.com/news-views-10-schoolpath.html)

November, A. (2001) 'Beyond Technology: the End of the Job and the Beginning of Digital Work' tech Learning at: [www.techlearning.com/db\\_area/archives/WCE/archives/november.html](http://www.techlearning.com/db_area/archives/WCE/archives/november.html)

NSW Public Schools Strategic Directions 2000-2002 at: [www.schools.nsw.edu.au/dse/D5.0/strategic/schools.htm](http://www.schools.nsw.edu.au/dse/D5.0/strategic/schools.htm)

Ohler, J. (2001) 'the e-learning Economy A Buyers Market'. The State Education Standard, Spring.

- Ostrom, M. (2001) Wired schools helping to narrow digital divide, September 5 at: [www.siliconvalley.com/docs/news/svfront/divide090601.htm](http://www.siliconvalley.com/docs/news/svfront/divide090601.htm)
- Pea, R. and Cuban, L. (1998) Bay Area School Reform Collaborative Funders' Learning Community Meeting Palo Alto, CA February 5 at: [www.nyscate.org/detector/detail.asp?rid=576](http://www.nyscate.org/detector/detail.asp?rid=576)
- Perelman, L. J. (1993) 'School's Out The hyperlearning revolution will replace public education' Wired Magazine, March/April at [www.wired.com/wired/archive/1.01/hyperlearning.html](http://www.wired.com/wired/archive/1.01/hyperlearning.html)
- Puma, M., Chaplin, D. and Pape, A. (2000) E-Rate and the Digital Divide: A Preliminary Analysis From the Integrated Studies of Educational Technology, September 21 at: [www.urban.org/education/erate.html](http://www.urban.org/education/erate.html)
- Richardson, T. (2001) ICT, Learning and Leadership: Implications for the School of the Future. Paper presented at TIPD Virtual Conference, July 2001 at: [www.cybertext.net.au/tipd/keynote/weeks1\\_3/richardson.htm](http://www.cybertext.net.au/tipd/keynote/weeks1_3/richardson.htm)
- Robinson, C. (2001) Interview with Dr Chris Robinson of Universitas 21. ABC News Radio, September 26.
- Sandham, J. (2001) Tech Training 101: Time Leadership and Incentives. Converge Magazine, July at: [www.convergemag.com/magazine/story.phtml?id=2530000000002713](http://www.convergemag.com/magazine/story.phtml?id=2530000000002713)
- Seymour, L. (2001) Some Push Hard for Software, Washington Post, April 19 at: [www.washtech.com/news/software/9159-1.html](http://www.washtech.com/news/software/9159-1.html)
- Shaker, E. (2001) 'Learning about the commercialization of education', CorpWatch at: [www.corpwatch.org/trac/feature/education/global/shaker.html](http://www.corpwatch.org/trac/feature/education/global/shaker.html)
- Shields, C. (2001) Curriculum Fusion, June 8 at: [www.edmediagroup.com/article.php?articleID=5230](http://www.edmediagroup.com/article.php?articleID=5230)
- Schubert, John (2001) President's address to AGM of Business Council of Australia, October 11, Sydney.
- Symonds, W. (2000) Special Report: Wired Schools, Business Week, September 25.
- Teacher Training Agency (2001) New Opportunities Fund Report ICT Training for Teachers and School Librarians: a report on the quality assurance findings in England, March 2001, London UK.
- Teather, D. and Cassy, J. (2001) How to learn the hardware way, The Guardian, March 15 at: [education.guardian.co.uk/elearning/story/0,10577,512987,00.html](http://education.guardian.co.uk/elearning/story/0,10577,512987,00.html)
- TechLearning News (2001) American's Attitude Toward Public Schools, September 18 at: [www.techlearning.com/content/ednews](http://www.techlearning.com/content/ednews)

Technology in the Classroom ABC Unified School District at:

[www.intel.com/education/teachtech/classroom/casestudies/abc\\_case\\_study.htm](http://www.intel.com/education/teachtech/classroom/casestudies/abc_case_study.htm)

Trotter, A. (1999) From Science and the Workplace Come New Tools of the Trade, Technology Counts 99 Building the Digital Curriculum, September 23 at: [www.edweek.org/sreports/tc99/articles/tools.htm](http://www.edweek.org/sreports/tc99/articles/tools.htm)

Walford, R. (2001) Anyone share my chocolate?, The Guardian, March 20 at: [www.education.guardian.co.uk/elearning/story/0,10577,512982,00.html](http://www.education.guardian.co.uk/elearning/story/0,10577,512982,00.html)

WA Office of the Auditor General (2001) On-line and Length? Provision and Use of Learning Technologies in Government Schools Reports to Parliament, Report No 2 – May 2001 at: [www.audit.wa.gov.au/reports/report2001\\_02.html](http://www.audit.wa.gov.au/reports/report2001_02.html)

Warlick, David (2001) Interview with Dr Fiona Stewart, June 15 at: [www.techlearning.com/db\\_area/archives/TL/200106/conversation2.html](http://www.techlearning.com/db_area/archives/TL/200106/conversation2.html)

Washington Post, March 15 at: [www.washtech.com/news/govtit/8339-1.html](http://www.washtech.com/news/govtit/8339-1.html)

Wax, E. (2001) 'Webcasts Increase Access to Arlington's School Meetings'

Web-based Education Commission (2000) The Power of the Internet for Learning: Moving from Promise to Practice, December at: [interact.hpcnet.org/webcommission/index.htm](http://interact.hpcnet.org/webcommission/index.htm)

Westbrook, T. (undated) The National Grid for Learning, ZDNetUK at: [www.zdnet.co.uk/pkdir/edirect/opinion/column23.html](http://www.zdnet.co.uk/pkdir/edirect/opinion/column23.html)

Zehr, M. (1999) Reviewers Play Critical Role In Market for Digital Content, Technology Counts 99 Building the Digital Curriculum, September 23 at:

[www.edweek.org/sreports/tc99/articles/eval.htm](http://www.edweek.org/sreports/tc99/articles/eval.htm)

Zehr, M. (1999) Screening for the Best, Technology Counts 99 Building the Digital Curriculum, September 23 at: [www.edweek.org/sreports/tc99/articles/screening.htm](http://www.edweek.org/sreports/tc99/articles/screening.htm)

appendix I  
glossary of technical terms

**American Charter Schools:** are a type of publicly-funded, self-governing school that can be for-profit, or not-for-profit, public or private. There are already more than 1,700 Charter Schools in the US that enrol some 350,000 students. Seventy per cent of Charter Schools have waiting lists. Operating as part of the local public school district (Centre for Education Reform, 2001), Charter Schools are characterised by:

- new or varied curriculums designed to improve student performance;
- longer school days and school years;
- an absence of teachers' unions;
- merit-based pay and stock options;
- less spending on administrative and central-office expenses;
- more parental involvement; and
- freedom from traditional school bureaucracy.

While there is some debate about whether these schools achieve higher education outcomes, they often offer a climate of innovation with many attempting to transform education to meet the demands of the digital age. That so many teachers, parents and local authorities who are willing to participate in the schools, is indeed telling.

**Chat:** Real time chat is the digital equivalent of a group brainstorming session. This means that the communication is immediate – right here, right now. Students can participate in chat that is open to the public. A chatroom is considered 'closed' if users need a username and password to log in.

For the purposes of e-learning, chat provides teachers and students with the opportunity to discuss and provide feedback on any aspect of participation. One of the drawbacks with using chat, however, is that the person who types the fastest 'says' the most. This may lead to a disjointed dialogue and to some students missing out on the conversation.

**Digital Repository:** A digital repository is a bit like a library – but in digital form. (It doesn't need a real space.) It's the virtual warehouse where learning materials or content that has been created can be stored and retrieved when needed. Without such a repository, any teachers who want to provide digital materials for a lesson generally have to start from scratch and make their own. With a digital repository, even when teachers make their own 'learning objects' or LOOPs, (Learning Object; Optimal Practice) they can be tagged in such a way that they can be used again by the same teachers or students – or by other teachers and students in other places who can also add to the virtual warehouse. And so the digital repository keeps growing. To manage such a digital repository – where teachers and students from all round the world can put LOOPs in as well as take them out – there is a demand for sophisticated metadata, which allows users to find whatever LOOP wherever and whenever they want it. The use of metadata goes hand in hand with a digital rights management system which is necessary for the administration of the intellectual property rights. This means that teachers – or students – who create learning objects can be acknowledged, and paid, when their work is used. Just as text book writers have been paid when people used their content in educational institutions.

**Discussion Lists:** provide an online space for messages to be posted and then stored for future use. Usually organised on a subject basis, interaction on a discussion list is said to be divided thematically into 'threads'. A user can post a message to one thread or to several simultaneously.

For teachers, discussion lists are a mechanism allowing students to generate class group discussion. In addition to altering classroom dynamics – by encouraging traditionally quiet students to participate – discussion lists do not necessarily require a teacher's presence. Students can take charge; this can promote self direction and responsibility, qualities that are highly prized in the knowledge economy.

While some email programs such as Microsoft Outlook offer discussion lists facilities, discussion lists can also be established – usually for free – through websites such as [www.Topica.com](http://www.Topica.com)

**e-Learning:** A process that allows learners to take charge of their own learning. It can be customised to meet the individual needs of different learning styles – any place, any pace. It is learning on demand. Technology is not e-learning, rather a tool to deliver e-learning. It engages learners to construct knowledge or meaning or understanding from information beyond the classroom walls. e-Learning can also be referred to as 'online learning'.

**Electronic Whiteboards:** A new version of the traditional whiteboards, the most recent edition of the electronic whiteboard provides touch-screen technology. A user can control the board by touching certain areas (eg. website links). These new electronic whiteboards allow everything that is written or drawn to be instantly recorded and archived for future reference.

In education terms, electronic whiteboards allow staff and students in different classrooms to save, print, email, or fax their notes and diagrams. When used with teleconferencing products, the whiteboard sessions can be teleconferenced in real-time with remote participants.

**Email:** Known as the 'killer application' of the Internet, electronic mail has revolutionised the way we all communicate. Email has not only made it possible for students to submit their work in a digital format, but it allows students much freer access to teachers. From the teacher perspective, discussion among colleagues is easier. Teachers can also communicate with students using email at a time and place that is convenient to them. Teachers can ensure that they deal with everyone fairly; they don't have to respond first to the most demanding or disruptive students; even quiet students who may not get a hearing in a classroom, can 'have the teacher's ear', online.

For parents and school communities, email is also an effective way of communication. This could be for school notices, permission forms, attendance checks, teacher interviews or for information about school events.

**Interactive TV:** For countries like the UK that have easy and widespread access to Interactive TV, digital course materials can allow teachers and students instant access to sound, video, interactive and 3D educational materials. All are said to be a welcome addition to the new technologies toolbox. Australia does not have this access, or this technology.

**Intranets and School Websites:** A common feature of government and independent schools alike, is customised school portals. These Intranets provide a one stop shop for information and communication for members of a school community. The facilities offered by an Intranet can include school policy and procedural information, time tabling and a knowledge management system which is capable of automating form letters and emails, attendance lists and school records.

In addition, school Intranets can provide staff and students with email addresses, customised discussion lists and extensive subject resources, including subject or Faculty homepages, links to relevant external sites, interactive exercises and experiments as well as self-administered quizzes and online exams.

These websites can also be used by teachers to:

- post FAQs from parents;
- state the goals for every course;
- provide examples of students' past work;
- recommended homework assignments for entire year;
- provide hot button connection to other sites; and
- advertise action research projects (Lingard, 2001).

**Open Portals:** In recent years, the number of education portals has increased rapidly. Providing information and resources in almost every imaginable subject area and linking to each other and a vast array of external sites, these portals serve a range of purposes. They can provide professional development for teachers, school and/or subject-specific activities and games, background resources for school lesson. They can also act as political action sites, as is the case with the new anti-standardised testing website – Pencils Down (see [www.pencilsdown.org](http://www.pencilsdown.org)).

**PC Tablets:** With 10 inch screens, these slim line, wireless PCs look more like hardcover books than personal computers. Described as a cross between desktop PCs and Hand Held Computers (eg. Palm Pilot) these tablets have touchscreens for typing and handwriting recognition, microphones for voice recognition and speakers for playing audio files. They also have full web browsing and email and because they are easy to carry around, they are expected to lead the way in e-learning.

**Role of Local Education Authorities:** Unlike Australia, the UK does not have states. Instead, its education system is administered through a network of Local Education Authorities (LEAs). These authorities form a bridge between schools, communities, colleges of further education and local government. They have responsibility for:

- planning the supply of school places for a given area;
- taking account of population trends and transport patterns across authority boundaries (including decision-making about school closures or mergers);
- ensuring student access to school places, both within and outside mainstream school;
- intervening in failing schools; and
- taking decisions, in consultation with schools, about the distribution of the schools budget.

LEAs also address special education needs, student access and school transport, school improvement and failure rates, along with the education of 'excluded' students and overall student welfare.

**Short Messaging Service (SMS):** While mobile phone SMS is the social communication method of choice for young people – in education terms SMS has found a variety of purposes. These include: teacher-sent group reminders for assignments and a new way for students to pass notes in class . SMS is also being used as a tool for student surveillance. In this respect, schools can use this real time service to notify the parents if their children are absent or truanting.

**Webcasts:** are the streaming or showing of video images over the Internet. These 'casts' can be in real time (immediate or synchronous) or they can be retrieved from a website and viewed in the user's own time (asynchronous). In education terms, webcasts are increasingly being used for staff meetings, parent teacher information nights and student presentations to the school community. At some universities, webcasts are even used for graduation ceremonies.

**Wireless Technology:** Tipped to play a key part in the 'next generation' of Internet technologies, wireless enables students to move around, but remain connected to the Internet. Students can work inside and outside of classrooms and they can work in a variety of different groups or at 'cooperative learning tables', instead of in lines of desks. Wireless allows for laptop computers as well as Hand Held Computers (eg. palm pilots) to be used.

**world wide web (www):** the section of the Internet where millions of pages of information are stored and linked together.

In education terms, the www is similar to the traditional school library. It is the place where students search for references, retrieve information and/or specialised materials; this may take the form of the world's best experts or simply hard-to-find information.

The use of search engines means that students can show initiative in their gathering and using information from the www. With more than 1.5 billion web pages said to exist, there is little excuse for information (or a variety of information sources) on a particular topic or subject area not being found. However, just like books, webpages vary greatly in quality. Sorting the good from the bad is another challenge for today's e-learners.

appendix II

# international – national grid for learning

## National Grid for Learning: Schools Initiatives

### GridClub

Launched in January 2001, the GridClub ([www.gridclub.com](http://www.gridclub.com)) is an interactive 'facility' for students aged 7 to 11 years. GridClub combines broadcasting, the Internet and other powerful learning resources.

Funded by the Department for Education and Skills (\$A12 million), the aim of the GridClub is to use a diversity of media to 'help young people to succeed in homework, examinations or simply discover more about the world.' The website includes: news items, fun tests, jokes, links to individual clubs and a section for 'grownups.' This Public Private Partnership currently involves: Oracle, Intuitive Media and 4Learn (Channel 4).

### Out of School Hours Learning Program

The Out of School Hours Learning Grant Program opens half of all secondary and special schools, and one quarter of all primary schools in the UK, to community learning activities.

Learning activities supported by the program include music, drama or art activities; sports; key skills assistance; volunteering activities and much more. Of the total allocation, \$50 million is now being used to establish Summer Schools throughout the UK.

Many states in the US operate similar programs. Some Australian states currently allow rural school facilities to be used by the immediate community for a limited range of activities (see eg. [access@schools](mailto:access@schools) in Victoria).

### All Girls Computer Clubs

All Girls Computer clubs are currently being established throughout the UK by the Department for Education and Skills and the Department of Trade and Industry. The key aim of the clubs, which will take place at schools out of school hours, is to encourage young women 'to take up Information and Communications Technology (ICT) as a career.'

These clubs are a direct response to a Government taskforce report which recommended that young women need to 'see careers in ICT as accessible, credible and enjoyable.'

### Parents Online

Parents Online uses an interactive website ([www.parentsonline.gov.uk](http://www.parentsonline.gov.uk)) to:

- strengthen home-school links;
- make parents aware of the support they can give their children using ICT;
- increase parents' awareness of how their children use the Internet;
- provide parents with information about online safety; and
- increase everyone's confidence in using this technology.

Parents Online is achieving these aims by demonstrating the range of educational content available on the Internet and providing parents with information and content on various topics, places for comment, competitions and online Questions & Answers. In all respects, Parents Online is a clever and innovative way of skilling and reskilling parents for a Knowledge Society.

## **NGfL (National Grid for Learning): Teacher Professional Development Initiatives**

### **Talking Heads**

Talking Heads ([www.ncsl.gov.uk/ncsl/index.cfm?pageid=5](http://www.ncsl.gov.uk/ncsl/index.cfm?pageid=5)) is the first national online learning community for Head Teachers. Established by the National College for School Leadership (NCSL) Talking Heads aims to facilitate discussion and networking, and provide opportunities for Head Teachers throughout the UK, to share common problems with other school leaders.

Through the Think.com virtual environment, users are able to contact each other, debate relevant education issues and exchange ideas about practice within both 'closed' and 'open' communities and at a national level.

### **Teacher Retention Project**

Second and third year teachers are the focus of a new \$50 million pilot scheme that aims to support, develop and retain teachers beyond their first year of teaching. The scheme which begins in late 2001 will run for three years and will involve 10,000 teachers. It will focus upon:

- master-classes and teacher discussion groups on issues such as lesson planning, dealing with disruptive and challenging behaviour in the classroom;
- helping teachers to observe other teachers at work in the classroom to raise educational standards;
- improving teacher information and communications technology (ICT) skills; and
- encouraging mentoring and coaching of individual teachers by more experienced colleagues.

## **National Grid for Learning: Community Initiatives**

### **Living Library**

Living Library ([livlib.eduweb.co.uk](http://livlib.eduweb.co.uk)) is a new reference and resource online library service for teachers and students. An example of a digital repository, it provides thousands of reference articles, pictures and multimedia clips from the UK's most respected publishers. Living Library is used by more than two million school students regularly, and almost half of all primary schools in the UK. Living Library is operated by the company, Research Machines (RM), which supplies ICT to UK schools.

## **Wired Up Communities**

Wired up Communities ([www.dfee.gov.uk/wired/index.shtml](http://www.dfee.gov.uk/wired/index.shtml)) is a \$A20 million initiative that provides home Internet connection in seven of Britain's most disadvantaged communities. The objective is to assess how access to the Internet 'can transform opportunities' for people, 'by developing new ways of accessing learning, work and leisure services.'

## **National Grid for Learning: Quality and Content Initiatives:**

**Spark Island** ([www.sparkisland.com](http://www.sparkisland.com)) is a joint initiative between London Electricity and the NGfL. An online learning channel for three to 12-year-olds, Spark Island provides teachers and parents with age-related and curriculum-based learning resources to 'help children practise and develop core skills in a highly interactive and enjoyable way using the full capabilities of digital media.' These resources include: lesson plans, articles, news and links to other sites. Schools pay an annual fee of \$A400 for access. Access to the Parents' Site costs \$A100 per annum and provides articles covering everything from curriculum concerns and how to choose a school.

**New Opportunities Fund** ([www.nof-digitise.org](http://www.nof-digitise.org)) is a partnership between community and voluntary sectors, local authorities and archives, museums, further and higher education and the private sector to create a digital repository. It supports lifelong learning under the broad themes; cultural enrichment, citizenship, and re-skilling. Providing a system whereby text, drawings, photos, maps, film and sound recordings can be stored and accessed digitally, nof-digitise.org is generating an invaluable information bank, spanning arts and culture, community information and materials to support basic skills. Beneficiaries of nof-digitise.org are both users of public libraries and, of course, schools.

**BBC Schools Online** – The BBC has long been a contributor to school education in the UK. At the current time, the BBC is spending more than \$A270 million to develop a digital version of the national curriculum. This initiative will give teachers the ability to customise material for individual classes and students. The service – which is currently being piloted in 50 primary schools – will be delivered through the Internet and to use interactive television.

## **National Grid for Learning: Public Private Partnerships**

### **Education Action Zones**

The Education Action Zones (EAZs) program was established in late 1998 to help schools, parents, the community, business, and local authorities work together, to address local education problems. Operating throughout Britain, these Action Zones approach education as a social responsibility.

### **Example: Birmingham EAZ**

At the time of writing, the partners in the EAZ in the Aston and Nechells area of Birmingham included the local Training and Enterprise Council, Birmingham City Council, the local LEA, CAP Gemini (consulting

company), Cadbury Schweppes and the Birmingham Forward (a network of 250 city centre blue chip companies). This Zone involves 3 nursery schools, 17 primary schools and 2 secondary schools. The focus is upon:

- Early Years Programs that include pre school;
- the Funding of Special Learning Assistants;
- Targeted Intervention Strategies for schools (to reduce absenteeism and to encourage higher and further education); and
- an Extended Lifelong Learning Network (for all community members).

The Zone is expected to provide 20 per cent rise in test results over 3 years:

- 20 per cent decrease in exclusions from school;
- attendance rate average 90 per cent; and
- 50 per cent increase in school building opening hours for community learning.

appendix III  
case studies

# Case Study 1: World Wide Web

## Dubble (UK and Ghana)

One of the more innovative ways to use email is for cross-country class collaboration. This is exactly what the Comic Relief Web Nose Day initiative known as Dubble is doing.

For one year, a Year 8 class in a school in the Effiduase community in Ghana is currently communicating with an equivalent class in an English school at Parkside in Cambridge. These classes are using the Internet to exchange emails about their everyday lives from how Valentine's Day is being celebrated locally, to the topography of wildly dissimilar environments on the students' routes into school (Walford, 2001).

This is even though the Ghanaian coordinator – Nurrudin Boateng – must bring his own equipment to the school and obtain his Internet connection in the town.

While the English children describe sweet shops, their Ghanaian peers send video footage of men with machetes, and poor children selling goods on the side of roads.

The emails that are exchanged spark lively debate such as 'why do the Ghanaian students talk so much about God?'

Instigators of the initiative are eager to point out that the exercise goes beyond the exchange of chit-chat to the broader social and economic issues that affect both communities.

As coca producers, the Effiduase students' parents grow coca for the Fair Trade brand Dubble. The English children can buy Dubble chocolate at their local shops while examining their choices about spending money. These children can also gain 'confidence and responsibility' in 'playing an active role as a citizen' – all important aspects of the UK curriculum.

In art, also, the Cambridge students have used the insights about the farming lives of their Ghanaian peers to design posters about Dubble and Fair Trade.

'In drama, we took details from the Effiduase children's mails as starting points for scripting TV 'ads' about fair trade,' Susanna, 13, explained (Walford, 2001).

And the benefits go further. As Nurrudin sends his students' letters, maps and digital video to the UK, the Parkside students use their 'media specialist school' status to cut the material into a succinct form, creating theme-linked interactive games for the curriculum.

In these ways, the ICT link bears living testimony to this global interconnection via the 'chocolate chain' – and for teachers at Parkside, it has proved a popular way to enliven lessons (Walford, 2001).

And the Dubble Lives website provides an effective resource for students and teachers learning about Fair Trade the world over (see [www.Dubble.co.uk](http://www.Dubble.co.uk)).

## Case Study 2: School Websites

### Millennium Schools (UK)

The Millennium Schools initiative in the UK is a privately-funded service that provides UK schools with the technology they need to design and maintain their own professional quality websites. For an annual subscription of \$500, schools can incorporate any of the following.

- Headteachers can create and post vision statements, advertise teaching vacancies, highlight student and school achievements, advertise departmental inspections, provide advice to new parents.
- Teachers can post homework tasks and assignments, organise and flag class work, post department news items and alert both other teachers and students to particular curriculum activities.
- Students can use the website technology for communication about and the posting collaborative class work and assignments, to post visit reports and other projects and for the advertising of school events.
- School secretaries can use the website technology to group email forms to the students' home, for newsflashes and to advertise school calendar dates on a regularly updated basis.
- School librarians can use website technology to post 'books of the week', to learn about new software and for advertising library-related events.
- Parents can use the website technology to gain interactive access to Parent Teacher Association notices, news and agendas, and postings about funding, events and appeals.
- School governors can use the website technology to access meeting agendas, school and other administrative reports and building and educational plans.
- School catering staff can use the website technology to post weekly menus and specialist and popular recipes (see [www.millenniumschoools.co.uk](http://www.millenniumschoools.co.uk)).

## Case Study 3: Electronic Whiteboards

### Upper Murray Secondary School Cluster (Australia)

In the Upper Murray area of Victoria, a cluster of three secondary schools including Tallangatta, Mt Beauty and Corryong have been using electronic whiteboard technologies to work together since the mid 1990s.

Supported by Microfield Graphics Softboards, teachers and students have used a whiteboard in the usual manner, while laser scanners have been incorporated to transfer the written images to a PC located next to the whiteboard. A modem connection on a standard phone line has transferred the data to other remote sites. Each site has had a live view of the contents of the other's board.

For the schools, involved, the system has meant that whiteboard sessions can be recorded and played back later. For teachers, the whiteboards have enabled the forward preparation of classes.

## Case Study 4: Wireless

### Wireless Use of Hand Held Computers (UK)

The British Educational Communications and Technology agency (BECTA) is currently promoting school-based use of hand held computers (eg. Palm Pilots). These technologies are proving effective for:

- inputting data where the work is outdoors or mobile;
- sharing writing between students; and
- note-taking in round-table discussions.

Philip Morant College in Colchester UK is currently trialing the 'Learning @ your Fingertips' project with Year 12 students. Using Compaq iPAQ devices, these handheld computers are being used in the three ways noted above (refer [www.compaq.com/showroom/handhelds.html](http://www.compaq.com/showroom/handhelds.html)).

Teachers are interested in this project because students are expected to:

- achieve higher than expected results in public examinations;
- increase their competence in the use of ICT; and
- develop a research project for PocketPCs in education.

Already, staff at Philip Morant have noted a change in learning with a reported shift to a more collaborative learning culture where students and teachers are more likely to share ideas and resources (see [www.philipmorant.essex.sch.uk](http://www.philipmorant.essex.sch.uk)).

## Case Study 5: Short Messaging Service (SMS)

### Yishun Town Secondary School (Singapore)

At Yishun Town Secondary School in Singapore, students' attendance at school is being monitored using a mobile phone text message broadcast system.

Beginning with the recording of the names of absent students in an electronic database, an automated SMS message is generated and sent to the parents of a missing student. The parents can then choose from one of 'four pre-set SMS replies providing an excuse for the child's absence or stating they are unaware of their child's whereabouts'.

According to school principal Tan Teck Hock, the aim of the new system is to reduce the amount of administrative work as well as increasing home – school links.

This innovative system is currently being trialed on 400 13-year old students with the 1,400 member school expected to be fully wired by the end of 2001.

## Case Study 6: PC Tablets

### **The School Path (USA)**

The School Path program is a two-year pilot project by US companies Sonicblue and River Logic. The aim of the program is to assess the pros and cons of the PC Tablets in schools.

Starting in September of 2001 in primary and secondary schools in Boston and California, the Tablets will enable students to access the Internet, provide access to customised curriculum and allow them to sit tests online. The Tablets will enable staff to access their curriculum management system as well as a wide variety of 'education content from leading brand names in the education market'. This will be achieved without the need for students or staff to carry bulky laptops or worry about cables and connections.

## Case Study 7: Electronic Roll Calls

### **Roll Calls (UK)**

For most schools, the morning roll call is a manual, face-to-face activity. While the human interaction part of roll call can remain, the digital recording of student names can make a teacher's life much easier.

For instance, electronic registration allows staff to log on to the school Intranet to find out quickly who is absent on a particular day or from a particular class. In turn this allows schools to alert the family concerned much earlier than would otherwise have been possible.

With some independent reports have shown that electronic registration can reduce truancy by up to ten percent, it is easy to see why the UK has made electronic roll-taking a national education priority. From 2002, more than \$A22 million will be spent introducing the system to 500 secondary schools.

## Case Study 8: Portals

### **TESCO Global SchoolNet 2001 (UK)**

An innovative example of an 'open access' portal is the new UK-based Global SchoolNet 2001. Sponsored by English supermarket chain TESCO and software companies Intuitive Media and Ultralab, the Global SchoolNet 2001 website provides students from more than 17,300 schools with the opportunity to create and publish their own web pages.

Global SchoolNet 2001 currently hosts some 53,223 student web pages, with 32,135 more pages currently in progress.

Website access is soon to be extended to children from around the world.

## Case Study 9: Digital Libraries

### **Curriculum Online – Digital Course Materials (UK)**

The Curriculum Online initiative aims to use the National Grid for Learning (NGfL) to provide digital course materials for all National Curriculum subjects by April 2004. This \$A84 million project will be produced by the BBC in conjunction with Granada Media.

From September 2002, digital course materials will be available in six GCSE subjects. This will give teachers and students instant access to sound, video, interactive and 3D educational materials.

Maths, science and history course materials have already been piloted in a small number of schools. The 'maths course used actors to show how stunt men use Pythagoras' Theorem in car stunts. The science course included film of a fire-eater to demonstrate the elements, 3D animation of atoms, and footage from experiments which could not be carried out in a classroom' (Department of Employment and Skills, 2001).

The aim of Curriculum Online is to create a national online library with video files, newspaper cuttings, historical documents, major artworks and other interactive material that will be available to everyone.

In the first instance, the course materials will be accessed via a 'Cybrarian' that will use voice recognition to allow users to ask about a particular topic and to provide online assistance and support.

This Artificial Intelligence approach has been devised to help new computer users, 'especially those with poor literacy and information handling skills or visual impairment.'

## Case Study 10: Webcasts

### **Mantua Elementary School (USA)**

Mantua Elementary School in Fairfax County in the US is said to be one of the most wired schools in America. Not only is the Internet used as a research tool in class. Webcasting has become the preferred tool for the traditional end-of-year presentation.

For the teams of Year 6 students graduating, end-of-year presentations now involve a 30-inch television monitor, closed-circuit cameras, recorded music, hand-held microphones and a three-by-four-foot computer screen with cascading Web sites.

According to Principal Jan-Marie Fernandez 'the children find this perfectly normal and natural'. Even when 'Web sites crash, teleconferences disconnect and software freezes, [students are taught that] that is part of learning in the new age' (Mathews, 2001).

appendix IV  
online learning communities

## UK Communities

**Schoolsnet** ([www.schoolsnet.com](http://www.schoolsnet.com)) – is a successful, resource-based website that provides a guide to every school in the UK, an online library (with more than 20,000 titles), schools sports news and interactive lessons and revision packages.

**BBC** – The BBC website is reputed to be the most visited information site in Europe. With a long history of providing educational programming, the BBC is already one of the e-learning market's most important players producing digital learning objects of exceptional quality (see eg. [www.bbc.co.uk/education/bookcase/historyofbooks/](http://www.bbc.co.uk/education/bookcase/historyofbooks/)). The BBC's development of a Digital Curriculum will not only provide national curriculum content online but will provide media-rich learning tools for students everywhere.

Other UK media organisations committed to creating sustainable and high quality learning communities include Channel 4 ([www.homeworkhigh.co.uk](http://www.homeworkhigh.co.uk)) and Granada Media.

**Learn.co.uk:** The new Learn.co.uk ([www.learn.co.uk](http://www.learn.co.uk)) website is backed by The Guardian Newspapers group of companies. Launching in May 2001 and planning 'to cover every dot and comma of the National Curriculum', this site is expected to license content to bigger portals as well as sell subscription packages (Teather and Cassy, 2001).

See also the NatWest site — <[www.natwestf2f.com](http://www.natwestf2f.com)>

## US Communities

Education and e-learning portals in the US already number in the thousands and include corporate sites, grass roots community action sites, resources-based and interactive sites. The focus of these communities ranges from school principals and administrators to K to Year 6 specific sites. A selection of US communities is provided below.

**New York Times Learning Network** ([www.nytimes.com/learning/index.html](http://www.nytimes.com/learning/index.html)): This leading learning community provides teachers with resources such as lesson plans and conversation starters and students with Q&A sections, 'Ask a Reporter' and a space for the publication of high school newspapers. These features make this website a helpful and informative portal, facilitating communication within the education community. Of course the catch of corporate sites such as this is the aim of increasing subscriptions to its print newspapers.

**Allexperts** ([www.Allexperts.com](http://www.Allexperts.com)): Allexperts claims that it was the first large-scale question and answer website. Created in early 1998 and initially intended to supplement search engines, Allexperts.com has grown to be staffed by volunteers from professions such as law, medicine, engineering and science. All answers are free and most are delivered the same day.

**BigChalk** ([www.Bigchalk.com](http://www.Bigchalk.com)): is one the most established of all learning communities in the US. With separate teacher, student, librarian and parent sections, Bigchalk provides everything from print and digital resources to professional development courses and supplementary curriculum materials in areas such as 'Girls and IT'. The site also advertises education employment opportunities and hosts local community web page and websites.

**Teachersource** ([www.pbs.org](http://www.pbs.org)): Teachersource is part of the general Public Broadcasting Service website and aims to provide a listing of resources and advice to pre-K-12 teachers. Covering most media (eg. TV, radio, Internet), Teachersource offers lesson plans and activities in the humanities, social sciences, math, science and technology and health and fitness.

In its Technology and Teaching section, the site provides tutorials in software applications, live interactive forums with teaching experts (eg. PBS Teacherline), content tips for e-learning, web-based lessons and the annual Think Quest competition that 'challenges students to use the Internet as a teaching and learning tool.'

**Mrs Glosser's Math Goodies** ([www.mathgoodies.com](http://www.mathgoodies.com)): is a free educational website featuring interactive math lessons, homework help, worksheets, puzzles, message boards. The site states that it contains over 400 pages of free maths activities and resources for students, teachers, and parents.

**Discovery Channel School** ([school.discover.com](http://school.discover.com)): This website is the website for the TV Discovery Channel and Discovery Magazine. With excerpts from the magazine, and information about future competitions, events, this on the strength of this 'online school' is providing resources in a diverse range of curriculum and general interest areas. The website caters for students, parents and teachers.

**Access Excellence** ([www.accessexcellence.org](http://www.accessexcellence.org)): Access Excellence is a specialist national educational website that uses the Internet to 'provide high school biology and life science teachers access to their colleagues, scientists' and resources.

Developed by biotechnology company Genentech Inc. in 1999, the website is now a part of the National Health Museum.

As a learning community, Access Excellence is one of the most comprehensive of all websites, providing not only a vast array of science and biology-related resources, but interactive forums in a range of areas such as teaching, careers, science, technology in education as well as in specific student sections.

The website also invites educators to submit their work for peer review or publication. Along with its emphasis upon news and the latest updates, Access Excellence acts as a one stop shop for teachers (and students) in the US and elsewhere.

**AT&T Learning Network** ([www.att.com/learningnetwork](http://www.att.com/learningnetwork)): provides a range of information and resources for teachers, families and communities.

For teachers there is a Virtual Academy within the site that aims to provide teachers with 'the best in online teacher professional development resources'. Encouraging teachers to use the technology infrastructure that's in place to learn how to use the technology to help improve teaching and learning, the Academy offers free and fee-based e-learning courses, with some courses even accredited.

For families and communities the Learning Network provides an extensive list of links for websites in areas such as: Web Sites that Parents Will Find Fun and Educational for Their Kids; Guides to Internet Use and Safety; Guides to Personal Computer Use by Families; Help for Parents Involved in Their Children's Education and Parenting Skills and Advice. School librarians are also provided with their own links to relevant websites and resources. From a commercial perspective this site also provides extensive

information about broadband including specific broadband content; the Broadband Site of the Month competition; the Emerging Technology Awards for Teachers; and the Teachers Network Broadband Project which seeks to use streaming video to highlight and showcase the work of exemplary teachers.

A further initiative of the Network is the ENRICH program (Educators Network Resource in Chicago). This program aims to train high school biology teachers to develop curriculum that integrates technology into learning. The program is focused upon leadership skills and preparing teachers to become e-learning 'change agents'. Since 1997, more than 100 Chicago high schools have been involved. An example of the program can be found at: [www.officeport.com/enrich/lessons/Taxonomy&Biodiversity/Bug\\_Safari/Intro.htm](http://www.officeport.com/enrich/lessons/Taxonomy&Biodiversity/Bug_Safari/Intro.htm)

Other American learning communities include:

- [teachers.teach-nology.com/index.html](http://teachers.teach-nology.com/index.html);
- [www.sitesforteachers.com](http://www.sitesforteachers.com); and
- [atozteacherstuff.com](http://atozteacherstuff.com).

### **Australian Communities**

**EdNA Online:** The Education Network of Australia ([www.edna.edu.au](http://www.edna.edu.au)) is the leading learning community for Australian teachers, providing information and resources about all aspects of learning and education.

In its current form – and with a new user interface – EdNA also offers a range of interactive facilities such as discussion, forums, chat, noticeboards and an email alert service.

In all respects, EdNA has attempted to establish itself as a one-stop-shop for teachers, students and others within the Australian school community.

**AMPs Journey of a Nation** ([www.montage.edu.au/amp/thejourney/default.htm](http://www.montage.edu.au/amp/thejourney/default.htm)): is the website that complements the real life Federation events – 'Journey of a Nation' travelling Expo. The expo is sponsored by AMP and has been on tour throughout all states and territories of Australia.

By providing teachers with the resources of lesson plans in curriculum areas such as Civics and Citizenship, Australian History, Politics, Studies of Society and English, the Journey of a Nation learning community targets students aged 6 to 15 years, encouraging them to 'look back, take stock of our past and look to the future'.

To complement the learning activities, Journey of a Nation also provides an interactive space for students to post their own work, as well a competition for students to submit musical compositions, poems, stories, essays, paintings, sculptures etc, that reflect their thoughts on Australia's future.

**The Teachers Corner** ([www.theteacherscorner.net/index.htm](http://www.theteacherscorner.net/index.htm)): is a US-based website which contains thematic sections for countries such as Australia. An interactive site, Teachers Corner not only contains lesson plans, themed units and other teacher resources, but provides interactive space for teachers to discuss all aspects of curriculum and e-learning theory and practice. In this respect, this site promotes discussion and communication among teachers from different countries but who are interested in similar issues or face similar challenges.

**Virtual Research Institute:** The VRI is a purpose-built Australian website where students can contribute to the current and ongoing work of scientists from leading research organisations.

Hosted by Sofweb, VRI provides a range of real experiments for students and their teachers to explore. These online research experiments form the centre piece for the 'School Community Opportunities for Real Experiments in Science' (SCORES) initiative which is a combined initiative of Department of Education, Employment and Training, Science in Schools Strategy and the Department of State and Regional Development in Victoria.

SCORES has been designed specifically to engage students in stimulating experiences in science, through their involvement in real research conducted via the VRI web site.

**The Le@rning Federation:** Schools Online Curriculum Content ([www.socci.edna.edu.au](http://www.socci.edna.edu.au)): is a new initiative between the Curriculum Corporation and education.au limited. Aimed at creating a pool of online learning objects, this new initiative is said to offer increased flexibility and opportunity to teachers and learners alike. With a completion date of 2006, the Le@rning Federation will create online content for all schooling systems, materials for teachers, information about articulated standards and information on intellectual property agreements. The initiative is funded by Commonwealth and State governments to the tune of almost \$A70 million.

For additional copies of the report or questions about e-learning, email the Commonwealth Bank at [elearningineducation@cba.com.au](mailto:elearningineducation@cba.com.au)

CLN1197 04/02



**Make it happen.**