# Moving towards an Effective Electronic Training Environment

*Issues and Concerns for Training and Development in the New South Wales Department of Education and Training*

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**Abstract**: Education is moving from teaching and learning based on face-to-face delivery by teachers regarded as the fount of all wisdom, content-dominated curriculum, and print-based resources toward flexible delivery by facilitators who encourage collaborative learning and the acquisition of problem-solving techniques, using multimedia resources.

This transition is rarely smooth, as educators grapple with the need to adapt traditional teaching and learning strategies and to develop new strategies to incorporate new technologies. It is not only the educators who need to adapt, but also the administrators. Technology should never be seen as the cheap alternative. Development of multimedia resources by a project team incorporating project manager, instructional designer, educator and technical support personnel can be lengthy and costly. Fast, reliable access to the Internet and communication using video conferencing can mean major redevelopment of existing infrastructure at a cost of many millions, as is happening in New South Wales (NSW) schools at the present time.

The Training and Development Directorate within the NSW Department of Education (DET) is very aware of the potential of new technologies to enhance its operations. This paper examines how the Directorate is integrating technology into professional development programs that support changes in teaching and learning. The paper also identifies the strategic planning which needs to occur across the NSW DET to ensure a smooth transition to an effective electronic environment for the whole organisation.

# 1.       STRATEGIC DIRECTIONS

The traditional limitations on the way people work are changing more rapidly and to a greater extent than at any other time in recent history. Rapid development in communications technologies is now extending the boundaries of education beyond the classroom, school/college, organisation, or even country is helping to achieve this move. Predicted for a number of years, the effects of this development are only now being felt by teachers, students, and educational administrators, so, as Gilbert (1997) points out, "they are the ones most likely to bear the most traumatic brunt of this technology revolution, as well as the first to enjoy fully the opportunities it opens up."

It is impossible to consider schooling and work now and in the future without considering the implications of new technology on teaching and learning and the opportunities they will offer. Mehlinger (1996) suggests that the use of new technologies will have a profound effect on schools. The relationship between teachers and students will be challenged because through use of services such as the Internet, students can communicate directly with the authors and developers of information and question their ideas at first hand. The new technologies provide students with access to information that was once under the control of their teachers.

The focus of teaching and learning is slowly changing from being teacher-focused and teacher-controlled to a situation where the teacher acts as facilitator and learning is less individual and more collaborative. The emphasis here is on learning concepts and developing problem-solving skills rather, than on rote learning of information aligned to specific areas. Technology can support this changing paradigm in the classroom by providing tools that manage information, enable fast and efficient electronic communication, and make collaboration over distance readily manageable.

Communications technologies can transcend and thereby transform traditionally hierarchical organisational structures, and, in so doing, directly affect how people plan, organise, and manage the work they do. As the Institute for Learning Technologies, Columbia University found when developing its strategic plan for educational leadership: "What starts as an energising empowerment all too quickly becomes an impediment of installed obsolescence" (1994). It is now crucial that organisations do not let technology drive their agendas but that, through careful and considered planning now, they develop and put in place the appropriate infrastructures and strategies that will support and nurture a stable foundation for effective operation.

## 2.      NEW SOUTH WALES DEPARTMENT OF EDUCATION AND TRAINING

The New South Wales Department of Education and Training (NSW DET) whose head office is in Sydney, Australia, is the largest education provider in the southern hemisphere. Since the amalgamation of the former Department of School Education with the TAFE (Technical and Further Education) Commission at the end of 1998, the DET now has responsibility for over 2,200 K-12 government schools and 11 TAFE (Technical and Further Education) Institutes, comprising colleges offering trade and professional training programs. The NSW DET has a workforce of over 150,000 people.

The Training and Development Directorate within the NSW DET is responsible for:

- conducting and coordinating statewide analysis of training and development needs and priorities
- developing, delivering, and supporting training and development and state wide professional development programs to address priorities and needs
- providing policy advice on training and development issues
- monitoring, evaluating, and reporting on the effectiveness of training and development
- supporting and assisting TAFE institutes and schools to implement training and development initiatives
- international programs and initiatives
- marketing training programs and materials
- implementing quality management and communication systems for promoting and disseminating best practice in training and development.

This paper examines the Training and Development Directorate's is integration of technology into professional development programs that support changes in teaching, and learning and the implications of this integration on technology and infrastructure planning for the directorate. This paper also identifies the strategic planning that needs to occur across the NSW DET to ensure a smooth transition to an effective electronic environment for the whole organisation.

## 3.      ISSUES AFFECTING CHANGE

Before focusing on the activities of the Directorate, it is worth considering some of the factors that will affect strategic planning. These include:

**Costs**
Organisations must look for ways of reducing costs without cutting services. For example, electronic distribution of resources across a large organisation can publish information more quickly and effectively than print and post.

**Sharing of scarce resources**
Skills and expertise are not readily available in all areas across all subjects, particularly in rural areas. To establish online networks and communities that can share expertise and experience is very valuable to any large organisation.

**Tyranny of distance**
Australia has developed a reputation for its rapid uptake of new technologies (Australian Bureau of Statistics 1996) and has pioneered their use in distance education. This may be in part, due to the distance between centres and the need to be able to communicate easily across the country. It is invariably the remote schools that are the most enthusiastic users of information and communications technologies even though they may find it more difficult to access support services (Lowery, 1987). However distance remains as one of the biggest inhibitors to training delivery in the traditional format, particularly in NSW. Traditional delivery of professional development courses is very expensive since it involves travel (often very expensive air travel), accommodation, and teacher replacement costs. Cutting down on these costs to deliver training to the workplace is a very attractive alternative for management, one that also benefits those receiving the training in terms of their time.

**Extending the reach of school and college beyond the traditional boundaries of classroom, school, college**
Technologies like video-conferencing have the potential to enable teachers and students to interact at a distance almost as well as when at the same location.

**Bringing the "expert" into the teaching arena**
Schools and colleges can extend their traditional boundaries by communicating electronically with those in industry and the community who are experts in their field and who may be located anywhere in the world.

**Managing change**
The paradigm of teaching and learning is changing — no longer is the teacher regarded as the "sage on the stage" but rather a facilitator who promotes cooperative learning, learning of concepts rather than facts, and learning based on problem-solving rather than on provided solutions.

**Taking risks**
Because it is possible for students to mix and match courses from different institutions to make up a course of study, competition among institutions,

and even among sectors within a given institution, is likely. Vocational education and training will most probably be affected first.

Emerging technologies, and their rapid and enthusiastic adoption in enterprises, provide organisations like the NSW DET with options that potentially offer greater efficiencies both for clients and for staff.

# 4. USING TECHNOLOGY IN TRAINING AND DEVELOPMENT DIRECTORATE

The Training and Development Directorate is very aware of the potential of new technologies to enhance its operations. The Directorate has already begun to implement new technologies in its day-to-day work practices and as tools to improve and enhance teaching and learning. The Directorate has had to resolve a number of significant issues as it integrates communications technologies into state-wide training and development programs to:

- Model new ways of teaching and learning
- Deliver training to the workplace
- Reduce geographic and professional isolation
- Deliver just-in-time training on a range of educational issues
- Provide access to quality training independent of location
- Be competitive in an increasingly global education marketplace
- Make the best use of budget allocations
- Effectively integrate technology into work practices including financial operations and collection and monitoring of statistical data

In many of these areas this directorate is a leader within the organisation. Being the "Lone Ranger" (Bates, 1997) can be exciting and lead to successes in innovative projects, but it also involves some risks. Despite these risks, it can be stimulating, exciting and rewarding to work at the leading edge of using information technologies to provide learning experiences that are qualitatively different from their predecessors (Alexander and McKenzie, 1998), thereby providing significant advantages to the Directorate and to the organisation as a whole.

# 5. EXAMPLES OF PROGRAMS

The Training and Development Directorate is integrating technology into the development and delivery of a number of programs, including information skills and early literacy intervention, as well as providing opportunities for online discussion on a range of education issues. The following Training and

Development professional development programs present a sample of how technology is being used to support learning.

## 5.1      Technology in Learning and Teaching (TILT)

TILT is a 30-hour training program for teachers who have not had the opportunity to develop technology skills for the classroom. The program is being delivered to 15,000 teachers over a four year period. TILT is a key component of the Computers in Schools policy that includes access to the Internet and technology support for all 2,200 schools, additional computers in schools, and curriculum materials supporting the use of technology in the classroom

TILT is delivered through small face-to-face workshops, through videos, resources on the Internet, and in-school follow-up sessions. All of the resource and support materials encourage teachers to use technology in innovative ways in the classroom. The videos, filmed in a range of primary and secondary classrooms, demonstrate how computers can support group learning and problem-solving activities in classroom teaching. The workshops encourage teachers to discuss their learning with their peers and to learn from each other, while the in-school follow-up sessions provide opportunities for participants to reflect on their learning and extend their new skills. Students can see for themselves that their teachers are continuing their learning beyond the years of formal schooling, thus emphasising the need for everyone to regard learning as a lifelong activity. From formal and informal evaluations of TILT, teachers have reported that the program has given them increased confidence with technology. Many have said that they are now comfortable in asking their students for help since they recognise that, in many instances, they can learn from their students, thus helping to reinforce the concept of the learning community (Training and Development, 1998).

## 5.2      Leadership Strategy

The Department's Leadership strategy provides relevant, targeted and comprehensive training and development for aspiring and current school executives at all phases of their careers. It incorporates a wide range of learning options and uses technology to ensure it is accessibility to all teachers. The strategy uses technology to deliver the program and to provide technology training to school principals and school leaders. Those in leadership positions in schools need to enhance their own technology skills and understanding in order better to understand and foster the use of technology in education. This need is becoming increasingly urgent as technology takes on a higher profile in learning, teaching, and school

administration. The Principal and School Development Program, one of the components of the strategy, requires participants to develop a learning portfolio. Participants are encouraged to develop an electronic portfolio that provides a practical reason for them to extend their own technology skills. At the end of the unit, participants have achieved a technology-based product that they can use in a range of situations including resumes, presentations to staff, and meetings with the school community.

## 5.3     Certificate of Administrative Leadership (CAL)

The CAL program provides leadership and management training for educational administrative and support staff. The majority of the program is self-paced; however, participants are encouraged to work in small groups of colleagues, preferably in the same location although this is not always possible, especially in very small schools where there is only one school administrative assistant. While CAL has been running for several years, technology is now playing a greater role in the program to encourage communication between learning partners who may be on different sites, to enhance communication between groups of learning partners and online mentors, and in the assessment of action-research projects that form a major component of the program. As well as e-mail, telephone conferencing was used to ensure regular communication between groups and mentors. This technology, now regarded as rather "low-tech", is attractive to schools because it is readily available, relatively inexpensive, and an accepted part of current work practices—all-important aspects of the successful adoption of technology. This year, video-conferencing was used to enable assessment of action-research projects, which all participants had to complete. Video conferencing enabled the same assessors to judge the projects from participants all around the state over a period of three days, instead of the assessors having to travel to each site, thus saving considerable time, energy, and money. Although none of the assessors or participants had ever used this technology before, they quickly accepted it and were able to concentrate on their presentations rather than on any barrier the technology might have presented. When asked to comment on their perception of video-conferencing, the users said that from point of view, this technology was almost transparent, almost as good as being there.

## 5.4     New Technologies, New Literacies CD-ROM

The Training and Development Directorate has been involved in the development of a number of professional development programs to support literacy and technology. The initial support documents and resources were

print-based, since print is still, for many, the easiest and quickest medium in which to develop materials and because participants in the programs did not always have access to or skills for the use of online resources. The latest in the series of resources is New Technologies, New Literacies (NTNL), a CD-ROM to be distributed to all schools in NSW. NTNL encourages users to develop an information skills process to assist in the finding, assessing, and presenting of information from a variety of media including print, CD-ROM, and the Internet. The program also looks at the skills of critical literacy that teachers and students need to develop so they can verify and critique the information they find. It is important for the process of adoption of new media that participants should increase their skills of understanding and interpretation by developing their own media products. To assist in this process, NTNL includes a software application which enables users to incorporate text, video, and audio resources on the CD-ROM into simple multimedia presentations of their own.

## 6.      WHAT THE DIRECTORATE LEARNED

The programs described above all ran trials as a precursor to full implementation. The evaluations of the trials brought to light some of the issues that need to be considered as part of the move to a more effective integration of technology into teaching and learning programs. These include:

- Technology can be a catalyst to change from teacher-focused learning to collaborative and cooperative learning. For example, the Internet can provide access to a range of resources and participation in online learning communities thereby providing opportunities for students to have greater control over their learning and its content.
- Technology can assist in providing greater equity and access to training and development programs. Teachers in their evaluations of training programs invariably comment that they have little time away from teaching duties to attend training. Many agree that they find advantages in being able to access training at the workplace, and some may prefer to access training in their own time.
- Access to just-in-time training is crucial for developers of professional development programs, since expertise was being developed on the fly. The attraction of new technology as an enhancement to teaching and learning is strong, and demand for programs incorporating new technologies usually outstrips ability to supply them, thereby often not allowing for the normal cycle of skills development to occur.

- There is a need for understanding the new media and adapting instructional design principles to maximise learning. Simply converting a successful print document to HTML and expecting it to be just as successful on the Internet is a certain road to failure. Alexander and McKenzie (1998) found that those technology-based projects that were not successful utilised particular information technologies for their own sake, without sufficient regard for appropriate learning design.
- There is a need for appreciation of the range of technologies available and of ways select those most appropriate for the task. Part of the instructional design must include the selection of the appropriate technology or range of technologies for the delivery of the course or program. No matter how elegant the learning package, if the instructional designers do not give sufficient regard for the needs of the participants, the results can be disastrous. There is a clear difference between those who design for the sake of technology and those who design instruction and then select an appropriate technology for delivery (Fudell, 1998).
- Assumptions that everyone works in the same way sometimes lead to communication breakdown and should not be made. For example, e-mail may be unanswered by people who have not yet fully adopted e-mail into their daily work practices
- Skills developed in the use of technology in day-to-day work practices can be transferred to the use of technology in learning and teaching. This transference of skills was identified by developers of training programs as well as by teachers who were encouraged to use technology to assist them in their administrative functions before taking technology into the classroom.
- Because the technology makes it possible, people often have unrealistic expectations of response and turn-around times, which can lead to allowing insufficient time for considered responses and decision making
- Traditional timelines and budgets in the area of materials development must be dramatically revised. The Open University (OU) in the UK has an excellent reputation for its quality print and video materials to support its subjects. While the OU is moving towards more flexible delivery, it still maintains its print materials development program which is firmly based on careful project management, a lengthy development and editing cycle, and a large team of academic and administrative support personnel to ensure the highest level of quality products. The standard development timeline is about three years incorporates a team of anywhere between 10 and 20 personnel, including a BBC producer, and is headed by an academic. There is a three stage editing cycle of all material. All of this adds up to costs running into the millions to develop

resources for a course with a three year shelf life with limited possibilities for updating during that period (Scrimshaw, 1998). It is likely that even the OU will have to revise its material development timetable to allow for rapid development of new courses to respond to new content demands and rapid updates in material increasingly published electronically rather than in print. The OU (and other organisations in similar situations) will then be forced to make some hard decisions on what to give up in order to work to decreasing timelines and expectations of resources that are no longer limited to print and video but now include multimedia CD-ROM and Internet delivery options.

- Acceptance that there are always risks involved in any new direction but that there needs to be trust (and additional funding support) within the organisation for those involved in the early phases of development. The ABC (Australian Broadcasting Commission) had the vision and the content to move into online delivery. However it had to fight for funding for development of its ABC Online site against a board which was not in favour of the move and which gave the ABC less financial support than it requested. Now the ABC has been vindicated, and its Managing Director, Brian Johns, says that ABC Online is one of the top sites in the country with over 7 million hits a month. In fact ABC Online receives, proportionate to population, far more hits than the BBC Internet service, the BBC costing three times as much per person than the ABC to run (Martin and Seccombe, 1999)

## 7.       MOVING FORWARD

The Training and Development Directorate, like many other educational organisations and sectors working to optimise technology in teaching and learning and in administration, has learned that the path is complex and ever changing, frustrating but always challenging. In order to ensure that innovation is fostered, while also ensuring that successful outcomes are incorporated into a well developed and managed structure, a number of issues must still be addressed by the Directorate and by the organisation as a whole. These include:

- Commitment and support at all levels of the organisation for successful management of technological change to take place
- Involvement by all major stakeholders in organisation-wide design, development, and support for communications network: phone and fax; Internet/intranet, e-mail; video-conferencing, satellite TV. Such a network should take advantage of size, purchasing power, support

capabilities, research and development opportunities, and leverage in the market place to provide the optimum environment for the organisation as a whole.

- Understanding of student/participant expectations in that not all students or professional development program participants necessarily want to change from traditional teaching and learning to alternative modes of delivery. A report on the readiness of tertiary students for flexible learning (Warner, Christie and Choy, 1998) showed that the vast majority of students in the sample studied expressed a preference for face-to-face and traditional modes of course delivery. They also viewed face-to-face delivery as their preferred mode of future learning. These findings have serious implications for the speed with which many organisations are moving to implement online delivery as a training option
- Research is needed to ensure that technology initiatives have regard for access and equity issues, training in the use of new technologies, availability and appropriateness of the targeted technology, consideration of a range of technologies to better support a variety of teaching and learning strategies, cost to the organisation and the individual user, and alternative structures for those unable or unwilling to learn and to work in this new way.
- Changes to some organisational structures and work practices so that, rather than developing content and then calling in designers, teams are established from the inception of the project. The teams should include instructional designers, content specialists, technology support personnel, editors, and project managers. This may require additional funding and some extension to traditional timelines for project completion, since most developers of computer-based learning agree that development time is considerably longer than for print based materials. It may also mean acceptance of some risk taking, since not all new directions will be successful.
- Agreement within the organisation on a level of distributed local responsibility to enable self-management of selected resources particularly in the area of electronic publishing. In this way, dynamic data can be monitored and updated on a needs basis rather than on the basis of outmoded systems of hierarchical control that only serve to slow down the process.
- Understanding that organisational leverage can play an important part in the dynamics of innovation in education. To move new possibilities from potentiality to actuality, educators need to develop leverage across the organisation. This leverage can increase its effectiveness when innovations become contagious and spread from school to school, area

to area. When that happens for a sustained period of time, systemic change will result (Institute for Learning Technologies, 1994). Technologies such as video-conferencing can only be really effective when the technology is available where and when people want to use it, but one area must make a start and demonstrate its usefulness in a variety of situations, such as holding meetings and delivering training. Once it is seen to be an effective communications medium, other areas in the organisation will follow.

## 8.      CONCLUSION

As educational organisations move into a new paradigm where teaching and learning need no longer be constrained by traditional boundaries and are free to respond to new market requirements for services and products, it is vital that these organisations take the time to review and, where necessary, to reconsider current structures and strategies. It is likely that the integration of new technologies into teaching and educational administration will lead to new infrastructures, a realignment of communication structures and strategies, and a review of change management processes.

The Training and Development Directorate is keen to accept this challenge and ensure that by planning and implementing a robust, well-planned technology strategy, it can use technology to develop and deliver professional development programs that will be more effective, offer greater equity of access, and model effective teaching and learning. The outcomes of such programs should help ensure that, as the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) recommends, "when students leave school they should have skills in analysis and problem solving and the ability to become confident and technologically competent members of 21st century society. They should also have a foundation for, and positive attitudes towards, vocational education and training, further education, employment and lifelong learning." (1998)

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