

'On-line and Length?'

Provision and use of learning technologies in government schools

Paper presented by Karen Trimmer, Principal Performance Analyst, Office of the Auditor General at AARE Conference, Fremantle, Western Australia, December 2001.

The full report may be found at http://www.audit.wa.gov.au/reports/report2001_02.html

Executive Summary

Background

A Learning Technologies Project was announced by the Minister for Education on October 28, 1998. Under this project the State Government allocated \$80 million to EDWA to fund the provision of learning technologies for 266 000 students in 770 government schools in Western Australia over four years. The Learning Technologies Project builds upon previous EDWA initiatives to introduce technology into schools and to integrate it into curriculum as a teaching and learning tool.

All funding provided through the Learning Technologies Project grants must go towards improving student access to learning technologies. In keeping with the Government emphasis on increasing computer numbers within schools, the Minister identified computer to student ratios as the key measure of access. Schools were required to achieve a computer to student ratio of 1:5 for secondary students and 1:10 for primary students by 2002.

Actual student access to learning technologies is also dependent upon other factors such as the capacity of schools to install and maintain computer networks and software, and the capacity of teachers to use the equipment for teaching purposes.

EDWA defined six critical success factors as a basis for evaluating implementation of learning technologies in schools including the Learning Technologies Project.

Overall Findings and Conclusions

The critical success factors form a sound basis for implementation, assessment and reporting for the Learning Technologies Project. These are:

- **planning;**
- **hardware;**
- **electronic educational resources (software);**
- **connectivity;**
- **staff capabilities; and**
- **integration and use.**

For each of these factors, a target level is identified and an assessment continuum establishes criteria for low, mid and high levels of implementation. The factors and the associated criteria are set out in Appendix A.

This examination assesses the implementation of the project against these factors. Because the Learning Technologies Project builds on and sits in the context of many previous technology initiatives, the examination also reviews the wider impact of learning technology in schools.

Planning

Planning and monitoring of the Learning Technologies Project has focussed on computer to student ratios rather than the achievement of the EDWA critical success factors. However, increased numbers of computers has not always translated to the expected level of student access, use or integration into teaching and learning programs in schools.

EDWA have not determined the full cost of implementation of either the project or the wider learning technologies program. The focus has been on acquittal of project funding and progress towards achieving ratios.

Most schools also spent funds from other sources such as school general-purpose funding on implementation of learning technologies. However, as these expenditures have not been reflected in their Funding Acquittal Statements the full costs of implementation have not been captured.

Of particular concern is that the effectiveness of project implementation and the impact of learning technologies on student learning is not being evaluated.

In addition, insufficient account has been given to infrastructure in the planning process. Infrastructure problems have impacted particularly on older schools and inadequate security in classrooms has affected the deployment and use of computers.

There has been little attempt by EDWA to formally assess the implementation of the project or the wider learning technologies program against the critical success factor framework.

Hardware

Schools are well on track to meet the target computer to student ratios by 2002 with EDWA 2000 census data indicating that 59 per cent of schools already meet these requirements. However, reported computer to student ratios can include computers that are inoperative or not accessible to students.

The majority of schools have opted to purchase rather than lease computers. However, none of the schools reviewed had conducted formal cost-benefit analyses of the purchase versus lease decision.

Inadequate accountability and asset management practices were in place in many of the schools reviewed. Compliance with purchasing requirements which assure value for money could not be demonstrated by 20 per cent of schools.

Frequent information technology (IT) breakdowns and time delays in solving difficulties and repairing faults disrupt lessons and are discouraging teachers from making greater use of learning technologies. Ineffective use is made of professional teaching resources, with many

schools relying on teachers, on a time-release and voluntary basis, to provide technical support.

Electronic educational resources (software)

EDWA has negotiated a centralised licensing agreement to provide cost effective access for all schools to a suite of operational software. However, almost 60 per cent of schools had inadequate software management and purchasing processes for other educational software investment. Twenty-nine per cent of schools were experiencing some hardware-software incompatibility problems.

Connectivity

EDWA census data, for 2000, indicates that 68 per cent of classrooms and 77 per cent of school computers are now connected to a network, but the performance and reliability of school networks varied considerably across schools reviewed. A higher proportion of rural schools reported network problems.

All government schools now have the capacity to access the Internet from at least one computer. However, the limited capacity of some schools to implement effective networks has resulted in high costs and limited access for students.

Staff capabilities

EDWA has commenced collection of baseline data on teachers' learning technology skills through a survey of 1500 teachers. Consistent with the results of the EDWA survey, teacher interviews revealed that over 95 per cent have more than a basic level of operational skills, but relatively few reported having trouble-shooting skills.

Over 90 per cent of teachers have undertaken some professional development in learning technologies over the last two years. The bulk of the professional development undertaken has focused on development of computing skills rather than how to integrate learning technologies into a teaching and learning program. As a consequence, the professional development undertaken was considered of marginal or no use in relation to their teaching and learning program for 31 per cent of teachers interviewed.

Peer mentoring was reported as the most effective method to enhance understanding and application to teaching and learning programs for most teachers interviewed. However, access to learning technology mentors was not readily available to 44 per cent of teachers.

Integration and use

Whilst the vast majority of teachers are making some use of learning technology, the degree of use and the level of integration into the curriculum are low. Inadequate access to computers, lack of adequate maintenance, limited or inappropriate professional development and infrastructure problems were identified by teachers as the main factors inhibiting greater use of learning technologies.

The deployment of computers has an impact on use with 49 per cent of teachers reporting having access to only one computer in the classroom. This level of access is significantly less than the reported computer to student ratios and restricts use and integration.

There was substantial variation within and between schools reviewed in the level of use and integration of learning technologies. It ranged from playing games as a reward at the conclusion of lessons, with no integration into the teaching learning program, through to extensive use as a tool to assist students to achieve curriculum outcomes across learning areas. The majority of teachers use learning technology in their classes for research, word processing and document presentation. Teachers will require ongoing support to assist further integration into teaching and learning programs.

Summary of Recommendations

Major recommendations made in the report are that:

EDWA revise project planning by:

- **placing greater emphasis on applying learning technologies to the school curriculum rather than simply achieving a target computer to student ratio;**
- **periodically assessing the implementation of the project and the wider learning technologies program by evaluating against the critical success factors; and**
- **considering the limitations of existing school infrastructure on the installation of computers and computing networks in schools and taking account of them in project planning and funding.**

EDWA promote more cost effective implementation in schools through:

- **monitoring asset management practices in schools to ensure compliance with EDWA policies and Treasurer's Instructions, including those designed to achieve value for money in purchasing;**
- **more effective provision of technical support in schools to reduce computer down-time and increase the confidence of teachers to use the technologies with their classes; and**
- **including in reported ratios only computers that are operating and accessible to students.**

EDWA promote effective integration into the curriculum by:

- **focussing professional development opportunities on the integration of learning technologies into the curriculum and promoting access to a shared knowledge base of learning technology resources; and**
- **pursuing strategies to accelerate the integration of learning technologies into the curriculum.**