1998

Public Accounts and Expenditure Review Committee

Tele-education

Discussion Paper 2

June 1998

Further copies available from -

State Law Publisher
10 William Street
PERTH WA 6000

Telephone: (08) 9321 7688
Facsimile: (08) 9321 7536

Published by the Legislative Assembly, Perth, Western Australia 6000

Public Accounts and Expenditure Review Committee

Tele-education

Discussion Paper 2

Presented by
Mr M.W. Trenorden, MLA
Laid on the Table of the Legislative Assembly
on 18 June 1998

ORDERED TO BE PRINTED

COMMITTEE'S FUNCTIONS AND POWERS

The Committee obtains its powers and functions from the Standing Orders of the Legislative Assembly. Standing Order 412(1) states that the functions of the Committee are -

> ... to inquire into, consider and report to the Parliament on any proposal, matter or thing connected with the receipt and expenditure of public moneys, including moneys allocated under the Annual Appropriation Bills and the Loan Fund.

Moreover, the Committee is empowered by Standing Order 412(2) to inquire into and report to the Assembly on certain specific matters and on any question which it deems necessary to investigate and to consider whether the objectives of public expenditure are being achieved or may be achieved more economically.

Matters can also be referred to the Committee by the House, a Minister, or the Auditor General.

MEMBERS OF THE COMMITTEE

Chairman	Mr M.W. Trenorden, MLA
Deputy Chairman	Mr L. Graham, MLA
Members	Mrs M.R. Holmes, MLA
	Ms A.J.G. MacTiernan, MLA
	Mr I.F. Osborne, MLA

COMMITTEE STAFF

Senior Research Officer/Secretary	Mr Andrew Young
Research Officer	Ms Amanda Millsom-May
Research Officer	Ms Kirsten Robinson
Secretary/Stenographer	Mrs Patricia Roach

COMMITTEE ADDRESS

Public Accounts and Expenditure Review Committee Fax: (08) 9222 7804
34 Parliament Place, WEST PERTH, WA 6005 Tel: (08) 9222 7467
E-mail: ayoung@parliament.wa.gov.au

ABBREVIATIONS

The Committee	The Public Accounts and Expenditure Review Committee
E-Commerce	Electronic Commerce
GWN	Golden West Network
IPAC	Industry Policy Advisory Council
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
I.T	Information Technology
OIC	Office of Information and Communications
PC	Personal Computer
SIDE	School of Isolated and Distance Education
TAFE	Colleges of Technical and Further Education

TELE-EDUCATION

DISCUSSION PAPER

1. INTRODUCTION

PAERC and Inquiry
The Public Accounts and Expenditure Review Committee is a standing committee of the Legislative Assembly of the Parliament of Western Australia. The Committee's main function is to inquire into and report to Parliament on any matters connected with the receipt and expenditure of public moneys, much of which is in the form of services to the public. In particular, the Committee is concerned with the efficiency, effectiveness and accountability of government expenditure.

Terms of Reference
The Committee has recently initiated an inquiry into the topic of *Government in an Online Environment*, with the following terms of reference:

To inquire into and report on the -

1. Existence or otherwise of a Government strategy for Western Australia's future in an online environment.

2. Role of Government in managing the convergence of information technology, telecommunications and intellectual property.

3. Effectiveness and equity of access to online services and online work for all Western Australians.

4. Implications of an online environment for regional Western Australia.

5. Economic and social implications for Western Australia in an online world.

6. Accountability of Government in an online environment.

The impetus for this inquiry was a concern about how the Government was meeting the challenges of an online world. The technological advances in telecommunications, multimedia and information technology are revolutionising the way in which individuals, businesses and governments communicate and interact with each other. In particular, governments have been forced by these technological changes into developing new ways to provide services to its citizens.

Given its role in examining Government expenditure, the PAERC considers it timely to investigate the efficiency, effectiveness and accountability of Government services provided online.

Discussion Papers
It is the Committee's intention to release four discussion papers in the near future, which will contribute towards a series of reports focussing on the terms of reference. Discussion Papers seeking public comment will be circulated on the following issues -

- Health;
- Education;
- Delivery of Services; and
- Efficiencies from E-Commerce.

A discussion paper focusing on Health was tabled in Parliament and released for public feedback on 30 April, 1998. This discussion paper focuses on the second area–Education–and outlines the issues that are likely to impact on the delivery of education in terms of effectiveness, equity, efficiency and accountability. The Committee's role in this process is not to prescribe what a tele-education strategy should consist of, nor to stipulate what technologies should be used to deliver online education.

2. TELE-EDUCATION

Why Tele-education?
This paper on tele-education follows the Committee's first paper on telehealth. Whilst the notion of telehealth is assisted by the many images of medical technology that we have become used to, tele-education is not so readily apparent. This basic difference between the use of technology by the medical and the teaching professions is highlighted by the following -

> If a doctor from 75 years ago suddenly travelled by time capsule and arrived in today's hospital, would that doctor be able to function? Not a chance. But how about a teacher from that same era in a contemporary classroom? The chalkboard, desks and multiplication tables would probably look all too familiar.[1]

What is Tele-education?
Tele-education can be a revolution in the way education is delivered and accessed. Tele-education has two important features -

- it allows the student to access information from beyond the four walls of the classroom, and from the world of knowledge that exists online; and

- it allows the student to learn by accessing tuition and information online without being physically present in a classroom.

Technology in schools or in the hands of the student at home does not automatically make either feature possible. A computer in the classroom is not capable of giving the student access to the

[1] Tapscott.D, 1996, *The Digital Economy: Promise And Peril In The Age Of Networked Intelligence*, McGraw-Hill, New York, NY, p.201

world of knowledge without a modem, adequate communications infrastructure and a curriculum and teacher that empowers the student to use these tools.

Information

Information has always been a significant part of education. Tele-education has the potential to dramatically increase access to information, but also to dramatically alter the way education is delivered.

Curricula, traditionally delivered by teachers and books, will become more dynamic as it is increasingly able to be delivered by video and audio capable online tools. The publishing of books has long carried implications for the cost of education and the ability to keep information current. The role of teachers and publishing will change, prompting the need for Government to address issues, such as -

- intellectual property;
- accreditation of information; and
- opportunities for dramatically reduced costs of information.

Differing perspectives of tele-education

The motivation and perspective of the metropolitan user and the non-metropolitan, distant or isolated user of tele-education services may be differentiated to some degree.

The metropolitan perspective - is evident in the literature and policies that emanate from states and provinces without the enormous geographic challenges faced by Western Australia and from policy makers with a brief to look at the broadest use of technology in the education system. It describes a new era in education in which online technology is a tool to help teachers to become mentors and facilitators and students to become independent, lifelong learners.

The rural and remote perspective - is influenced by the immediate challenge of accessing a core education due, primarily, to geographic isolation and the lack of access to a full range of subjects and specialized teaching. Tele-education affords students the opportunity to study in their home environment, accessing curricula and support programs through current technologies using a range of infrastructure, including both terrestrial and satellite communications systems.

Tele-education should lessen the imperative for schools or communities to have a minimum number of students to justify the provision of particular courses, which will now be online.

Online technologies have the ability to take government services and industry in two very different directions. Increased centralisation of services or decentralisation of services may be the result of tele-education technologies, but may be more about tele-education policies.

3. BENEFITS FOR WA

The skills required of the workforce today and in the future will continue to increase exponentially. The value of so many of the successful companies in today's global business community is based on skill bases, and ability to manage and maximise information.

In Western Australia, the Education Department is developing its strategic plans based on a recognition that the future will be characterized by -

- a diverse economy reliant on high levels of information and skills;
- increasing dependence on electronic / digital forms of technology;
- demands for greater quality of services and learning; and
- demands from the community for the Government to demonstrate greater value for money in the expenditure of public funds.

These features of the future bring with them a range of benefits - a diverse economy, high quality services and better value for money. The ramifications of not planning and resourcing the appropriate education response are therefore clear.

Access to Education
Whilst simply having access to the technology is not an end in itself, it remains a practical requirement for many distance and isolated students in WA. The Federal Government appointed Industry Policy Advisory Council (IPAC) highlighted the more immediate and practical requirements for these students and the positive impact of tele-education technologies. For example, in highlighting the *Western Australian Schools of the Air*, IPAC pointed out that online services, particularly email, have had a positive impact on isolated students by reducing the time between completion, review and return of work, allowing students to produce more work than previously.[2]

Consolidated Benefits
Tele-education technology and practices have the potential to make education more ***equitable, effective, efficient*** and ***accountable,*** but many issues must be addressed to achieve this.

EQUITY

Equity = quality of access = quality of curriculum = uniformity of education

Rural and Remote Access
Western Australia is characterised by its immense geographical size and isolated rural and remote communities. Schools of the Air and the School of Isolated and Distance Education

[2] Information Policy Advisory Council, May, 1997, *Report on On-line Infrastructure And Services Development in Regional And Rural Australia*

have provided education services to these communities against the great challenges of distance, isolation and, in many cases, inadequate and very expensive communications infrastructure.

Another geographically large country that has had to deal with infrastructure issues is the United States of America. A significant United States Government goal is that by 2000, all classrooms, libraries, hospitals, and clinics in the United States will be connected to the National Information Infrastructure. According to US Vice President Gore -

> It is a matter of guaranteeing access to essential services .... We cannot tolerate - nor in the long run can this nation afford - a society in which some children become fully educated and others do not. Nor can we permit geographic location to determine whether the information highway passes by your door.[3]

Metropolitan

The metropolitan area has long enjoyed advantages in terms of access and affordability of education. However, tele-education should not be seen as solely benefitting the delivery of education services to non-metropolitan areas.

Students must benefit from becoming capable users of online technologies and sources of information, because this is a fundamental skill for the workforce of now and the future. Online technologies in education mean more than just making a basic education accessible.

Issues which may impact on equity of access and capability in metropolitan schools include -

- Non-metropolitan communities have often been the most willing users of Internet and associated technologies, because of the obvious benefits to these more geographically isolated communities - the attitude and openness already exist.

- Similarly, teachers of non-metropolitan and isolated students are experienced in using and adapting to new teaching technologies. Many teachers in metropolitan schools may not have this experience and their ability to adapt to new teaching methods and technologies will impact on the capabilities of their students.

Teachers in metropolitan schools may benefit from greater access to teaching tools, databases of information and personal development tools.

In addition, schools administration may benefit from having more comprehensive and immediate access to corporate management information within the school and within the department. This will be increasingly important considering the demands placed on schools administration by devolution of responsibilities.

---

[3] Tapscott.D, 1996, *The Digital Economy: Promise And Peril In The Age Of Networked* Intelligence, McGraw-Hill, New York, NY, p.293

EFFECTIVENESS

Impact of Tele-education on measuring the effectiveness of education.
The statements of US Vice President Gore address the issue of the extent to which education should be universally available and the extent to which universal education is dependent on communications (information) infrastructure.

If education is a universal or community service obligation, then further questions remain to be answered -

- What is the appropriate level and quality of access to online education for any student?

  > This is a difficult question because the mechanisms for access and the sources of online information are so dynamic in the world of converging telecommunications, information technology and information.

- Therefore policy makers need to answer the more fundamental question - what criteria should be used to determine if an education service is being delivered effectively to all of those who require the service?

  > One of the major initiatives identified by the Education Department of Western Australia for 1998/99 is the development of a ‹State Strategic Plan for Rural and Remote Education and the means by which this plan is to be monitored annually'.[4]

- Whilst it has long been the rhetoric that education should be available to all, what is now meant by education and the basic tools of education? Do the basic tools of education constitute a modem, a multi-media capable Personal Computer and bandwidth that ensures equitable access?

- Is tele-education merely a means of improving access to education and information sources or an education in itself?

  > This is perhaps the most easily answered question. The use of computers, modems and the online environment is not just a means of accessing education, but a required life skill for any future employee or member of the community.

Criteria for addressing infrastructure / online needs
In remote communities technology and communications infrastructure decisions impact on all aspects of life, including education. Consequently there should be an impact analysis of technology and infrastructure changes in remote communities.

---

4 Budget Paper No.2, Vol 1, p.354.

Socialization

An important feature of schools and classrooms is the student's exposure to a social setting. Tele-education has the capability of bringing education to the home and diminishing the requirement for the traditional school classroom and therefore diminishing the student's exposure to the social setting.

An analysis of the effectiveness of education in the future will need to be cognisant of the social aspects of schooling. Issues include -

- the extent to which tele-education will alter human interaction;
- the extent to which socialization is a responsibility of the education system and a factor in its overall effectiveness; and
- recognising that education has long been delivered outside of the traditional classroom setting to a minority of students who have had to seek alternative social settings.

Infrastructure

The installation of fibre-optic cable will never be a possibility for many remote Western Australian communities. Means must be found to service these communities. Without these means, predictions of the emergence of two classes of citizens - the information rich and the information poor may be proved correct.

The quality and type of technology adopted can have a significant impact on rural and remote communities and on education. For example, where the Integrated Services Digital Network (ISDN) is available, the School of Isolated and Distance Education is better able to deliver programs to students using video conferencing.

The State Government's *Communications Audit*, which reported in May 1997, highlighted the deficiencies in communication infrastructure in rural and remote Western Australia. The Report identified a growing demand for second telephone lines, mainly for fax/data transfer. These services are not covered by the Universal Service Obligations[5] and are therefore too costly for many families. The Audit reported that the additional demand for lines was -

> ... due to the fact that many rural households contain businesses (eg farmers) as well as the usual household communication needs for education, entertainment and general communication.[6]

The extent to which the planned roll out of digital satellite receival equipment to 200 rural and remote schools provides a network right across the State, and the extent to which it significantly benefits the delivery of curricula will need to be determined.

---

5 Federal Government imposed obligations on Telstra

6 *Communications Audit: The Needs of Regional Western Australians*, May 1997, undertaken for Ministry of the Premier and Cabinet et al by The Boshe Group, West Perth

Schools management

Schools management is an important issue and one that cannot be discounted from the quality of education equation. An Education Department project, 'Personnel 2000', is planned to help teachers and principals in schools access a whole range of information for themselves, such as leave. The question that will need to be answered is whether the online information capabilities of schools matches the devolution agenda in which schools are expected to become more independent and self-managing.

EFFICIENCY

Subject availability

Tele-education should not be seen merely in the context of overcoming remoteness. A significant number of students enrolled at the School of Isolated and Distance Education (SIDE) are not enrolled as full time students, but enrol in certain subjects, whilst also doing available subjects at their school. Examples at SIDE include -

- 1,587 subject enrolments in years 8 to 10 - approximately 500 full time students;
- 2,000 subject enrolments in post-compulsory - approximately 885 full time students.

The education system must respond to parent, student and community demands for a variety of subjects, which cannot be all taught on site by the individual school. Metropolitan as well as non-metropolitan students should be able to access a wider choice of subjects by accessing the subject online.

Curricula

The potential to replace books and other written materials with online information may lead to reduced costs. However, increased efficiency is only achieved if there is an incentive to produce the information and the information is actually created**.**

As students increasingly access information from all over the world, it is reasonable to expect that education systems will establish efficient means of providing courses and materials by sometimes accessing them from outside of Western Australia. For example, a committee of distance learning institutions throughout Australia has been established as a forum for considering ways to share the cost of producing materials.

Purchasing Power

The Education Department has aggregated its purchasing power to provide IT products to schools at competitive rates. The Department has also centralised licensing agreements with key software providers, such as Microsoft, in order to ensure equal access to software and to minimise license administration overheads. Consideration should be given as to what extent can and should aggregated purchasing power be maximised, despite processes of devolution of responsibilities to schools,.

Integration of Education with Other Services

The Information Policy Advisory Council recommended that -

> The Government should support regional organisations to enhance and develop the level of communications services to their communities, through strategies such as ... developing community access to advanced services in community centres such as libraries, schools, local government facilities, telecentres, health centres, etc.

WA has a network of 51 telecentres, a range of disparate telehealth programs, both non-government and government sponsored, a School of Isolated and Distance Education and five schools of the air, located at Kalgoorlie, Carnarvon, Derby, Meekatharra and Port Hedland. Behind these services sit Agencies, such as the Education Department, the Health Department and the Office of Information and Communications (OIC).

It is clearly important that the OIC and the Government take the lead from the IPAC and provide the most efficient and effective response by ensuring that these services co-ordinate. Ensuring optimal bandwidth, pricing and range of services will be achieved most efficiently in this scenario. The 1998-99 budget funding of education technology is positive, but does not appear to have been matched by funding to enable the Health Department to implement its telehealth strategy. The potential exists for a continued lack of coordination and inefficient outcomes unless funding reflects a whole of Government approach to going online.

ACCOUNTABILITY

The concept of online learning and schools administration are key features of improved efficiency and effectiveness. They are also features that raise issues of confidentiality, standards and accountability.

Accessing education from other states and countries - Standards

Australia does not have a national curriculum. As a result the concept of globally available education raises local policy issues, such as the achievement of student outcomes, particularly in the area of literacy and numeracy.

There has been some exchange of teaching expertise in English as a second language with teachers in Western Australia delivering programs to students in the Northern Territory. Television programs for the teaching of Indonesian were purchased from Victoria and transmitted through SIDE's Leederville television station to support the teaching of Indonesian in Western Australia.

Information / curriculum being appropriately valued as an asset

An accountable education system will have to properly value the curriculum that it owns on behalf of Western Australians, just as other Western Australian agencies will have to value their information and seek compensation for its use in appropriate cases. Where the information is an asset of the State, a return on the asset is justifiable if a customer (such as another education system) is to add value to their product (or system) by accessing the information.

4. OBSTACLES TO BE OVERCOME

Cultural change

This paper previously quoted the contrast between the role of technology in medicine and its historically less significant role in education. Whilst there are many students and many teachers who are competent and interested in computer and online technologies, the change to an online environment represents a major change for the culture of the 'education system'.

The IPAC's analysis of the opportunities for *Online Education Services* observed that -

> While the Australian education system has a long tradition of utilising communications technology to reach remote Students through the School of the Air and extensive development of print materials for distance education, schools and higher education institutions have to a large extent, been isolated institutions working within their own resources.

Teacher training and retraining will be a priority if the change is to be made successfully. Business plans, performance indicators and senior management's performance will all need to include 'online' goals which ensure that change is made from the top and throughout the entire education system.

Technology and cost

Technology costs are high, but associated costs are also high, particularly for rural and remote users. Maintenance is an example of a cost to these users, which may be translated into dollars or loss of access (and therefore loss of education quality) if there is a maintenance delay.

Technology implementation problems

This paper has argued that consultation and impact analysis must be at the centre of infrastructure and technology solutions. Such consultation and analysis has not always occurred. *For Example: The changeover to digital transmission by remote broadcasters is often beyond the affordability of many families and has added new difficulties for rural and remote families. In many cases, two decoders and two satellite dishes must be purchased for families to receive all transmissions.*

Post Secondary Education

Post secondary education may take many forms including universities and Colleges of Technical And Further Education (TAFE). The State Government and Parliament have very different responsibilities and jurisdiction with respect to areas of post secondary / higher education, compared to the areas of primary and secondary education.

However, the issues of infrastructure and online strategies are relevant to the State Government's ability to encourage equitable access to post secondary education. This is critical to the Government's effective and efficient delivery of life-long learning, which industry and educators increasingly argue is a fundamental requirement of the modern workforce.

Because post secondary institutions, particularly universities, have tended to be centralised, there will be a need to look at different methods of delivery, not only technologically, but also within the community. One example is the Esperance learning centre, which is integrating the

high school with tertiary education, the library and other relevant services as part of one large telecentre. Such an approach may lead to efficient and effective outcomes.

Whilst the positioning of an integrated education service in a regional area may increase access, life-long learning opportunities will still be denied to many in the most distant and remote locations. Some telecentres have become the Internet Service Provider (ISP) for their area, substantially reducing internet access costs for people. An efficient approach for Government may be to encourage and support telecentres to provide ISP services to as wide an area as possible.

The telecentres are also about to carry the Optus Horizon channel offering seven University Bachelor of Arts units, as well as TAFE and other adult education programs. People can benefit from these programs in different ways by adopting various courses of action from watching the programs and being sent additional written material, through to actual University enrolment. The programs commence in September 1998, although there is currently no guarantee of the service being provided after the first year.

The ability of telecentres to carry this service may assist in addressing the recent problem in rural areas of competing satellite networks - one carrying GWN with its entertainment benefits, such as football broadcasts and a second, the Optus Horizon education channel, which feeds into telecentres free of charge. In order for people to satisfy both entertainment and education needs, two satellite services are now required to be purchased if these people are to access education from home.

Western Australia has a major opportunity to develop online post secondary / tertiary education services due to the funding that has been committed by the Regional Telecommunications Infrastructure Fund and matching funding from the State. This is intended to extend the already rapidly developing telecentre network from 51 to 100 telecentres throughout Western Australia.

The opportunity will depend on, but not be limited to the following -

- the extent to which the effectiveness of education is defined as including access to 'life-long' learning opportunities;

- the ability of the Federal and State Government and education institutions to increase certainty about ongoing access to online university courses, so that people are not discouraged from enrolling on the basis that the service may discontinue during their studies;

- the ability to integrate services so that technologies or networks delivering entertainment, education and employment are not mutually exclusive;

- industry's awareness of and support for the opportunities that telecentres may be able to offer in terms of professional development learning across the professions and trades. (Important in so many professions where standards and the knowledge base is dynamic); and

- issues of intellectual property, accreditation of courses and openness to education institutions world-wide, where those institutions are prepared to offer an education service.

5. ISSUES

There are a wide number of issues that surround the successful implementation of tele-education. This paper has touched on some of these issues, which are summarized below -

- Are the tele-education plans and funding of the Government integrated with other online strategies? Is the Government making the most of aggregate demand, purchasing power, intelligence and experience?

- What will be the cost to this State of not implementing a comprehensive tele-education strategy?

- What is the likely impact of IT on the quality of education and ability to measure that quality and report it to Parliament?

- Equity of access and quality of access to education will be enhanced by the funding of the 'Computers in Schools' program. However, how significantly will the ongoing issues of communications infrastructure (such as bandwidth) and costs impact on the effectiveness of this program?

- What does the principle of treating the State's information as assets mean for the State's education system?

- What is the future classroom in an online education world? How will the efficiency, effectiveness and accountability of education be affected by this concept?

- To what extent should the socialization aspects of school and classroom be factored into the implementation of tele-education plans?

- What are the likely impacts on future accommodation requirements - at schools and central and district offices?

- The Education Department is requiring IT decisions (and many other management decisions) to be made at the individual school level. What support should be given to teachers, staff and the school communities to ensure that they have the knowledge and skills to make informed decisions?

- What is the potential for enrolments in tele-education subjects by all students in metropolitan and non-metropolitan schools to improve access to the broadest possible range of education and to increase efficiency in schooling?

- The potential exists to access online education services wherever they are in the world. How should the issues of education standards, qualifications and accreditation be addressed in a seamless online world?

- What is the role for the private sector in contributing to an effective education system in an online world?

- What accountability issues will emerge or are emerging as a result of the increasing interdependence of schools, communities and businesses?

- Will online education services be able to be satisfactorily verified?

- Will privacy and confidentiality be issues for an online education system?

6. CONCLUSION

This paper has highlighted a number of key issues and challenges which will significantly determine the equity, effectiveness, efficiency and accountability of tele-education. The Committee invites interested individuals and organisations to make written submissions by 6 August 1998 on any or all of the issues presented in this paper. Submissions can be sent to -

Mr Andrew Young
Senior Research Officer
Public Accounts and Expenditure Review Committee
Legislative Assembly
Parliament House
PERTH WA 6000

Telephone: (08) 9222 7467
Facsimile: (08) 9222 7804
e-mail: ayoung@parliament.wa.gov.au

Submission closing date: 6 AUGUST 1998