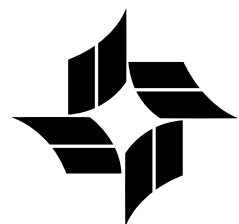


bandwidth

action plan



learning
in an ONLINE world



MCEETYA

Australia - New Zealand



National action is critical to achieving and managing the high bandwidth communication services fundamental to all schools realising the educational, management and administrative benefits of technological change.



cataloguing - in publication data

Bandwidth action plan : learning in an online world.

ISBN 1 920865 02 0.

1. Telecommunication in education. 2. Internet in education.
3. Education - Computer network resources.

I. Ministerial Council on Education, Employment, Training and Youth Affairs (Australia and New Zealand).

371.358

© 2003 Curriculum Corporation as the legal entity for the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).

Curriculum Corporation as the legal entity for the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) owns the copyright in this publication. This publication or any part of it may be used freely only for non-profit education purposes provided the source is clearly acknowledged. The publication may not be sold or used for any other commercial purpose.

Other than as permitted above or by the Copyright Act 1968 (Commonwealth), no part of this publication may be reproduced, stored, published, performed, communicated or adapted, regardless of the form or means (electronic, photocopying or otherwise), without the prior written permission of the copyright owner. Address inquiries regarding copyright to:

MCEETYA Secretariat, PO Box 202,
Carlton South, VIC 3053, Australia.

overview

Learning in an online world 2003 – 06 requires a National Bandwidth Action Plan that addresses the provision of affordable high bandwidth data communication services to all Australian schools. Such provision is currently the main infrastructure priority.

Education is a major user of Information and Communication Technologies (ICT). Broadband data communication services are a critical element for the successful utilisation of ICT in education.

The case for acting now on the provision of bandwidth to all schools is very strong.

Nationally, there has been a significant focus on strategies to improve access to broadband services for Australian schools.

The National Bandwidth Action Plan provides a framework that addresses the needs of all Australian government and non-government schools. It operates within the data communications aggregation strategies widely adopted by State and Territory governments. It is designed to:

- integrate with strategies proposed by the national Broadband Advisory Group (BAG) and
- leverage opportunities to link school sector strategies to VET and higher education initiatives.



At the July 2003 meeting of MCEETYA, Ministers endorsed the National Bandwidth Action Plan as the basis for the development of a National Implementation Plan.

The National Implementation Plan will be developed by the ICT in Schools Taskforce through a process of consultation with jurisdictions. It will provide the detail that is critical to realising the intent of the actions and outline the particulars of governance. It will also address the need to provide affordable broadband access for rural and remote students who study from home.

The National Implementation Plan will include solutions that can be achieved through collaborative work with the other education sectors and key Commonwealth agencies.



national issues

Bandwidth is Critical

ICT is inherent in most economic and social activities in developed countries. It is becoming ubiquitous and embedded throughout the economy and society.

Significant work has already been done in the school sector to improve bandwidth, computer to student ratios, software, online content, online services and the network infrastructure and communication systems that link people and computers.

Most schools are connected and quality content is becoming available. Much of the infrastructure is in place and teachers are increasingly equipped to exploit the resource.

Adequate bandwidth in schools is fundamental to increasing teacher effectiveness, raising the quality of classroom practice and building student engagement. It facilitates innovation and helps reduce inequity.

These improvements are essential for economic competitiveness, social strength and improved life chances for young people.

Technological developments make bandwidth a critical input for schools.

Pressures and Gaps

There are pressures and gaps in preparedness.

Bandwidth demand is increasing sharply but the way bandwidth is being used is poorly understood.

The part of a school's activity and budget that involves ICT is increasing. The cost of content transactions is set to explode. There are few systems to manage the cost.

There is no agreed educational or policy basis for determining bandwidth needs at any price point or for a particular set of outcomes. The ability to analyse current use and predict future needs is weak – sharing information on what is being done is patchy and difficult.

Simply being connected is no longer enough. Schools require a major increase in bandwidth and in their ability to take full advantage of its potential.



national issues

Total Cost of Bandwidth

Thinking in terms of narrowband versus broadband is not sufficient. The issue is not just the amount and cost of bandwidth. There is only a limited amount the school sector can do to reduce this cost.

What is important is:

- the **total cost** of using bandwidth (including content transaction costs) to deliver particular outputs, and
- the perceived value of this expenditure relative to other uses of scarce funds.

Delivering the Solutions

The market alone will not deliver a solution.

The market is not yet mature and truly competitive. There is a major imbalance in the knowledge and power of suppliers compared to purchasers and users.

This means the school sector cannot rely on the market as it does for most other 'commoditised' goods and services. To achieve an acceptable outcome, purchasers and users must operate much further along the marketing chain than is normally the case.

Barriers will best be overcome by a concerted effort on the buying side that is driven by the school sector. There are few incentives for suppliers or existing intermediaries to act.



There is a significant bandwidth gap between the technology solutions that are commercially viable in high-density and low-density locations. This means that the needs of the school sector are unlikely to be met by private investment alone.

There is little potential for the school sector, by itself, to have a significant impact on competitiveness at the macro level. The sector can and should act in a way that is consistent with wider competition - strengthening policies, building competitive tension through local actions. This will deliver immediate and long-term benefits to schools and the broader national interest.

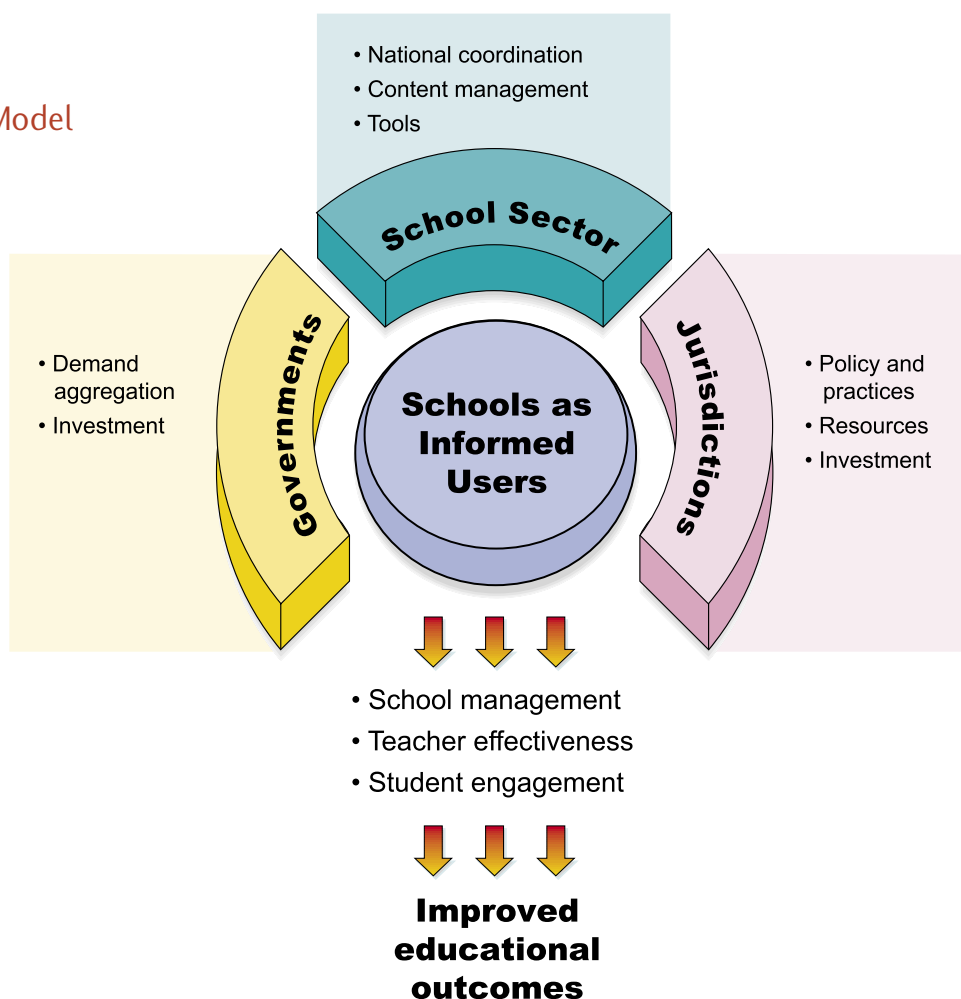
There is no easy solution to bandwidth provision. The school sector must deal with issues in a planned and organised way in order to deliver the best results to all Australian schools.

A portfolio of actions is required. The market needs to be approached at several levels.



portfolio approach

Model



The model places schools at the centre.

Actions build up from schools and down from the national and education jurisdiction levels. Each level plays an important part.

Schools focus on local needs, making prudent choices as informed users. They provide information on local needs to inform decision makers at other levels.

The education jurisdictions in each State or Territory control how bandwidth is to be used in their schools. They make most resource allocation decisions.

State and Territory governments maximise market leverage through geographic aggregation. They extract the best price and raw services from suppliers.

The school sector as a whole targets sector-specific national initiatives. The sector promotes informed management of bandwidth use in schools and the reduction of the cost of related elements such as content transactions.

portfolio approach

Aggregation

Aggregation is part of the answer.

It is sometimes argued that aggregating the demand for bandwidth across the school sector is the answer. However, the nature of the market, the characteristics of the school sector and the competing need for State and Territory governments to aggregate geographically make sectoral demand aggregation impractical.

The school sector will benefit most by working within the State and Territory structures established to aggregate bandwidth demand. The government education agency will generally work within a structure of geographic aggregation.

Passively accepting the standard offering will not achieve the required results. Schools have a role in achieving the mix of price and services that best meets local needs. Schools need to work as informed users within established jurisdictional frameworks.

Action to improve the use of bandwidth is best done on a sector basis. School sector co-operation and aggregation needs to be focused on:

- more informed management of bandwidth use in schools, and
- the reduced cost of related elements such as content transactions.

Informed Users

Schools need to become informed users.

Schools need to understand the total cost of using bandwidth. They need to:

- understand the options available through their education agency
- define the service package that best meets their local needs in terms of price and effectiveness
- actively manage the use of bandwidth at a local level.

Being an informed user does not mean that schools buy their bandwidth directly from the market. Schools work within a framework established by their jurisdiction. This needs to be an active two-way relationship focused on managing cost and access.

Schools are not well placed to do these things alone. They need programs to increase awareness and knowledge of issues, nationally consistent tools and on-the-ground advice. This needs to be provided by a combination of national and individual jurisdictional action.



strategic actions

Action 1

Adopt a coordinated, cooperative approach based around a portfolio of actions aimed at a long-term sustainable result.

Achieving a sustainable outcome on bandwidth provision to schools requires a coordinated, extended commitment to an action plan. This will require effort and resources. The alternative is uncontrolled pressure on costs with no guarantee of useful outcomes.

There has to be a long-term view because the market and technology are changing rapidly and suppliers will act in a predatory way to protect their interests. The plan requires changed behaviour by schools, within jurisdictions and through national action.

The school sector needs to be organised to work effectively with the market and with State or Territory government aggregators to improve bandwidth provision to schools and to address associated cost pressures.

While some of the portfolio of actions could be done on an ad hoc basis using existing mechanisms, it is unlikely that this would result in a sustainable high-value outcome.

There needs to be real cooperation and open sharing of information, in contrast to the current patchy and difficult process.

Action 2

Establish appropriate governance arrangements.

Give a governance body a written mandate from jurisdictions to manage the action plan.

Action on bandwidth is complex. The plan needs a formal high-level group to supervise implementation. There should be a clear written mandate agreed by all education jurisdictions, setting out the objectives to be pursued, the responsibilities and powers of the body, and the accountability of members.

Appoint members with sufficient decision-making power, and with joint and personal responsibility and accountability.

A governance body cannot operate effectively unless its members have sufficient authority within their home jurisdiction to make binding commitments at the table. Given the importance of the plan, the members should be accountable as a group and as individuals for their decisions and the use of resources.

Provide the governance body with direct control over adequate discretionary and capital resources.

If the plan is to be successful the people supervising it must have direct control over adequate resources. This would include control over a national pool of direct investment capital



strategic actions

and adequate discretionary resources to enable, as required, an agile response to market and technological changes.

Action 3

Invest in a better understanding of existing and future needs.

Obtain up-to-date information about existing business requirements.

The school sector does not have the information needed to be a fully informed participant in the market. Basic data are unavailable or not able to be compared. There is no agreed pedagogical or policy basis for determining how much bandwidth is appropriate in particular circumstances. Jurisdictions have been reluctant to share data in a timely and frank way. Sophisticated and up-to-date information on areas such as consumption, price dispersal and demand is needed as an early priority.

Develop modelling and analytical capability for future business needs.

The current approaches to predicting bandwidth and related demand are technology focussed rather than schooling focused. This needs to change.

There should be an agreed pedagogical and policy basis for predicting consumption including administrative uses, methods to compare expenditure on bandwidth with other competing

uses of funds, and tools to model the interaction between usage and price. This will inform decisions within schools, by jurisdictions and at the national level. It will make the sector stronger in dealing with the market and aggregators.

Develop, and agree on, a pedagogical and policy basis for future bandwidth requirements

Determining how much bandwidth is necessary has to be built up from the local needs of schools. It needs to consider the bandwidth required for teachers and students to achieve educational outcomes and for the school to efficiently undertake its administrative functions. Informed decision-making requires informed choices in relation to consumption as much as it requires supply-side actions.

Action 4

Assist schools to become informed users.

For schools to become informed users, they need access to information, analysis and facilitation resources. While specific arrangements may differ between jurisdictions, the majority of these resources are common to all schools. Most can be developed and applied on a nationally consistent basis.



strategic actions

Information, including the experiences of other schools, needs to be packaged and distributed using a comprehensive range of programs to increase awareness and knowledge.

Action 5

Establish a small national unit with analysis, negotiation, facilitation and technical capability, under the direction of the Governance body.

A comprehensive, coordinated national strategy requires organisational and technical capability. Much of this will be provided by the jurisdictions as part of their existing activities, as they are the dominant decision-makers and sources of action.

However, there are a number of functions that are best performed on a national basis with a small central resource working in conjunction with jurisdictions.

The national unit would coordinate the use of information and models to describe and predict bandwidth usage, develop tools and information to help schools become informed users, and advise on service packages and direct investment opportunities. It would improve negotiating capacity when dealing with suppliers and intermediaries and help aggregators understand the needs of the school sector. It would also coordinate mechanisms to reduce transaction costs associated with content including negotiating national content, peering and other supply agreements.

The unit would work with the other education sectors to identify and exploit opportunities for cooperative action.

Consideration should be given to establishing the unit within an existing group with a complementary role.

Action 6

Adopt a sector-wide approach to content transaction costs.

Even with no action from the school sector, raw bandwidth price will continue to fall (although this will be more than offset by demand growth).

The content component of total cost can only increase. Managing content transaction costs is likely to be the most important element of the provision of bandwidth to schools in the future.

Schools cannot influence most upstream content transaction costs. Even jurisdictions have limits on their ability to influence the market. A national approach to negotiating content provision agreements would maximise the market power of the sector. Further, many of the other opportunities for action are with national organisations or span jurisdictional borders.

The sector-wide approach should encompass both national and jurisdictional elements, including content provision agreements, inter-jurisdictional caching, content distribution networks and content peering, best price routing, ISP peering, and cost offset agreements.



strategic actions

The school sector should have a strong, nationally consistent position on legislation concerning the ownership and use of electronic content and digital rights management. This represents a significant access and cost risk in the near future.

Action 7

Strengthen competition through targeted initiatives, including direct investment to bridge priority gaps between market provision and the needs of schools.

The interests of the school sector are best served by an efficient, competitive telecommunications market. The importance of this can only increase as the role of ICT grows within schools.

Although it has limited ability to affect competition at a macro level, the school sector can contribute to the emergence of a more competitive environment by acting in a pro-competitive manner.

The targeted initiatives should include:

- developing nationally consistent tools for assessing bandwidth gaps
- sectoral plans and capital pools for content transaction infrastructure, other inter-jurisdictional investments and for areas with little likelihood of market provision
- consistent negotiating positions
- template contractual and other investment - related resources.

Direct infrastructure investment is essential to bridge the gap between market provision and school needs, especially for schools outside existing high-density areas. A credible strategy with resources for direct investment would improve the negotiating position of the sector with market suppliers and jurisdictional aggregators.

Non-traditional approaches to direct investment such as artificially 'extending' a high-density area to encompass a school or cluster of schools, thereby bringing them within a more favourable competition and price environment, should be considered.

Direct investment will also be required for those areas where there is no realistic likelihood of market-based provision at a level consistent with the pedagogical and administrative objectives for bandwidth.

In the absence of compelling evidence to the contrary, public funds should not be used to subsidise or reduce the 'Return on Investment' threshold for private investment.

In the main, direct investment will remain a matter for individual jurisdictions. Nationally consistent analysis, a common approach to jurisdictional aggregators, and sectoral plans and pools of capital for inter-jurisdictional investments are necessary to achieve the best overall result.



strategic actions

Action 8

Develop strategies to better exploit the opportunities provided by improved bandwidth, including moving beyond an 'add-on' culture in the use of ICT and actively identifying and redirecting the benefits in terms of resource substitution.

Improving the provision of bandwidth to schools and acting to manage content transaction costs is only useful if there are strategies to exploit the new opportunities it provides and to actively harvest the benefits – to recognise the need for change and choice.

The use of ICT and particularly bandwidth is generally seen as an add-on cost within education delivery.

Whilst this may be valid in the short term, over time it is necessary to manage this cost. The areas in which online content substitutes for existing approaches to education delivery need to be identified in order to quantify and redirect the savings to other areas of education or to increase access to online resources.

Schools need assistance to identify and implement ways of exploiting these opportunities.

Further information regarding this publication can be obtained from:

icctaskforce@mceetya.edu.au