STRATEGY FOR GENERATING ON LINE CURRICULUM CONTENT FOR AUSTRALIAN SCHOOLS

Background
This paper has been prepared for CESCEO and MCEETYA by Curriculum Corporation in consultation with Education.Au, Department of Education, Training and Youth Affairs, the EdNA Schools Advisory Group and the CESCEO Curriculum Group. The October 1999 CESCEO meeting decided to forward the paper to Ministers for approval out of session.

Purpose
The paper proposes a Strategy to establish a national framework and market for high quality on line curriculum content for Australian schools. The Strategy will take forward the on line content component of *The School Education Action Plan for the Information Economy* and is likely to require a substantial resource commitment over an extended period of time. An initial phase to develop a detailed Business Plan and Quality Assurance Framework within this current budget cycle is proposed.

Issues
- On line curriculum content will provide the critical means to enable students, teachers, schools and school systems to maximise the learning benefits of the broader investment in information and communication technologies (ICT).
- Access to equitable provision of high bandwidth services and effective professional development are matters of equivalent significance, without which the potential benefits of the on line curriculum will not be realised.
- Australia must continue to develop a strong and vigorous set of industries equipped to participate profitably in the information economy. For this purpose, we need a workforce skilled in the development and application of ICT, their components and applications.
- Establishing a strong Australian industry in on line content for school education will give the nation the opportunity to establish a leadership role and an export market in digital curriculum resources. This requires the establishment of an effective Australian market for producers and consumers of information technology products and services.
- On line technologies offer unprecedented opportunities to generate curriculum resources that can be customised for different users, are flexible and adaptable by teachers, and that can add value to existing content investment.
- Continuation of largely uncoordinated market activity will not generate systematic and comprehensive approaches to the provision of on line curriculum for schools. Initial government intervention is necessary to stimulate market activity.

Recommendations:
That Ministers:

1. Support a strategy to stimulate an Australian market for the generation of quality on line curriculum content for Australian school education.
2. Agree in principle to the establishment of a major project to generate on line curriculum content for Australian school education.
3. Agree to establish a project Steering Committee reporting to CESCEO and Ministers via the Curriculum Corporation Board to develop a fully costed Business Plan and undertake associated work.
4. Agree to provide an initial budget of $500 000 for the project from 1999/2000 budgets through the ACER formula for Commonwealth/State/Territory

contributions.

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The capacity to manage, share and create knowledge is a fundamental requirement for Australia's prosperity in a global economy. School education provides the foundation for the knowledge society and for the development of citizens who are creative, confident and enterprising.
(Draft School Education Plan for the Information Economy.)

1.   PURPOSE

This paper proposes a strategy to generate, over time, on line curriculum content for Australian schools. This curriculum content will be flexible, powerful, dynamic, interactive and will lead international best practice. The strategy takes advantage of the emerging e-commerce environment, local educational standards and the strategic commissioning of key products to create an Australian online educational content market.

2.   INTRODUCTION

Australian schools are in the midst of a major historical change in their technology base reflecting the broader social shift to new information and communication technologies (ICT) which are transforming the economy. While the long term impact on schools of this series of changes is uncertain, three things can be said with confidence:

- the change will provide radical new challenges to conventional processes of schooling;
- new technologies hold out a realistic hope for a significant improvement in learning outcomes for all Australian students; and
- effective adoption and exploitation of new technologies within education offer substantial economic and social opportunities to the nation.

In addition, the online global economy is in the midst of major change as a result of which we are likely to see in education:

- alliances and aggregations of publishing, media, telecommunications, software and Internet industries into new bundled services with significant purchasing and distribution power;
- large corporations seeking market share in Australian online education; and
- increasing consumer interest in on line educational products and services.

3.   ON LINE CURRICULUM CONTENT

The Commonwealth Government's paper, *Strategic Framework for the Information Economy* establishes the importance of on line curriculum content. The paper argues that if Australia is to gain substantial benefits from the information economy, an essential requirement, *inter alia,* is 'high quality, locally produced on line content that is relevant to Australia's education system'.[1]

The requirement is for on line curriculum content that takes full advantage of the possibilities offered by new technologies and which can be easily identified by teachers, students and parents as meeting specific curriculum requirements. In particular, teachers need to be able to easily and quickly access resources to construct programs to meet specific student need within an outcomes framework.

Some of this material may be available within the global market for direct use or adaptation and some may need to be developed. All of it will need to be accessed within an Australian curriculum framework.

For the purposes of this paper 'on line curriculum content' is defined as

Digital materials and tools that are designed to foster, generate and assess learning and thus have an inherent teaching or teaching support function.

This definition of on line curriculum content includes:
- discrete units of content coupled with learning activities;
- sequenced material to support a course;
- interactive activities designed to generate information, develop comprehension analysis and application of what is being learned;
- functions which facilitate access to other learning resources, including site links and communication with experts, other teachers and students;
- assessment tools;
- information management, learning management and resource discovery tools: and
- capabilities for teachers and students to adapt and interact with what is provided, and to create and circulate their own material.

4.   STATE OF THE MARKET

There is not a substantial body of curriculum content that is both Australian and on line. The provision of on line content for teaching and learning is in a formative state. The market, both commercial and public, is effectively serving a number of aspects of on line content. Software tools and applications are well sourced from the commercial sector, however, commercially available curriculum materials are focused in narrow areas of the curriculum, are variable in quality and limited in local relevance.

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[1] **National Officer for the Information Economy (NOIE),** *Strategic Framework for the Information Economy,* **1998, p.8, downloaded from www.noie.gov.au**

There have been rapid developments in relation to on line content and services in the USA, especially in the Higher Education market. This year has seen the development of 'portals' as players in the US market with profits derived from transactions and services rather than from information. Broadly defined, 'portals' are single sites that offer consolidated access to content and services. Over the next 3 to 5 years, it is likely that a small number of influential multinationals with control of large distribution and transaction networks will move to positions of global dominance.

In this context, there may be opportunities for Australia to attract e-commerce investment in either educational content development or its distribution in return for exposure or direct access to our education market. Such access could be governed by an agreed quality assurance framework.

It is therefore important to develop a detailed business plan for online content development and dissemination in Australian schooling in order for Ministers to be in a position to make the kind of public investment which will gain benefits for Australian students as well as the Australian economy.

While individual governments in Australia have invested in some on line content development in specific areas of need, it is unlikely that continuation of this largely uncoordinated activity will generate a national systematic and comprehensive approach to the provision of on line curriculum content. A coordinated approach to standards, strategic investment in specific content and a market strategy is more likely to achieve sustained long-term results. The generation of on line content cannot be left purely to the market. Initial government intervention is necessary to stimulate market activity and to provide the quality assurance framework that will guarantee appropriate high quality on line content.

5.   RATIONALE

EDUCATIONAL

Achieving National Goals

The *National Goals for Schooling in the 21" Century*[2] state (goal 1.6) that: '[In particular, when students leave school they should] be confident, creative and productive users of new technologies, particularly information and communication technologies and understand the impact of those technologies on society'.

Digital resources are firstly needed to assist students in meeting this specific goal related to information and communication technologies (ICT). Secondly, effective learning resources are a critical factor in assisting young Australians to achieve the full range of goals of schooling, by substantially enhancing the efficiency, effectiveness and teaching power of Australia's schools.

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[2] **MCEETYA, *National Goals for Schooling in the 21st Century*, April 1999**

Enhancing teaching and learning

On line content has a transformational role, which in an illustrative way can be compared to the change in pedagogical possibilities after the invention of the printing press. High quality digital resources can improve student motivation and attitudes to learning; present complex or abstract concepts more powerfully; improve students' work presentation skills; and address individual needs more directly.

Learning and information technologies enable collaboration and communication to extend beyond the classroom to others within the school, their community and around the world. Curriculum offerings can become both broader and more flexible in that students and teachers do not have to be located on the same site and integration of content across learning areas becomes a reality. Electronic management tools allow for flexible groupings of students and for the efficient creation of individual student pathways.

Teachers' learning can also be enhanced by access to on line professional development regardless of geographic location and the greater availability of mentors and peer support in and out of school hours.

. **Maximising the benefits of ICT investment**

Digital curriculum content provides a critical means by enabling students, teachers, schools and school systems to maximise the learning benefits of the broader investment in information and communication technologies.

The resources of State and Territory education authorities can be considerably expanded in the digital environment. Teachers and learners are less reliant on specified materials produced by governments to support a syllabus and the marketplace enters both the school and the home, providing significant learning opportunities if quality can be assured.

Digital content is not the only element required to support the digital transition in education. Access to equitable provision of high bandwidth services and effective professional development is matters of equivalent significance, without which the potential benefits of the digital curriculum will not be realised.

Preparing young Australians to participate in the digital world and the information economy.

Schools provide a foundation for a citizenry and work force with the requisite skills to manage the transition to an information economy. Students leaving school will require a range of skills in using ICT. Australia must continue to develop a strong and vigorous set of industries equipped to participate profitably in the information economy. For this purpose, we need a workforce skilled in the development and application of ICT, their components and applications.

Both factors are essential to the nation remaining competitive and buoyant in a world rapidly changing through the influence of the information revolution.

COMMERCIAL

Establishing a marketplace for Australian educational content

An emphasis on the achievement and measurement of individual student learning has the potential to create a demand for a wide range of tailorable on line content. Digital technologies and the emerging interest of large corporations in on line networks may support the supply of online content in Australia if assisted by the judicious and strategic investment by government and industry. Government also has a leadership role in making Australian standards available and explicit to assure high quality. Thus a viable marketplace for educational content can support students, build Australia's knowledge economy and assist electronic commerce.

Developing an Australian industry in on line content

Establishing a marketplace in on line content for Australian school education will give the nation the opportunity to establish a leadership role and an export market in digital curriculum resources.

The *Strategic Framework for the Information Economy* recognises that 'Governments have a role in encouraging the creation and production of innovative Australian on line content...' (ibid: 15) and that, 'Content development is another area in which Australia can carve a firm competitive niche for itself in the information economy. Moreover, local content development is essential if we are to avoid becoming a nation of consumers rather than producers' (ibid: 16)

Research is required to identify the niche areas in which Australian content has global market potential and to determine the strategic alliances required to realise the potential.

Increasing access to and use of existing curriculum content

While some new development is required, a coordinated national on line curriculum content development initiative represents an unprecedented opportunity to efficiently and cost-effectively repurpose existing materials in a range of media. Value can be added to existing content investment through sharing of existing digital content nationally; localising overseas content; and digitising appropriate content that is currently in a different medium.

Ensuring Australian content

Although Australian schools will use some global materials, a considerable amount of the materials must be Australian in focus to enable students to make links in their learning to familiar, local and immediate contexts. This is important for cultural and

educational reasons. If only for reasons of scale, these materials are unlikely to be generated from outside this country.

The need for a national effort

Efficiencies and economies of scale in developing digital content to support both distance and mainstream education and the creation of an economically viable customer base will require a national collaborative effort. The market must be sufficient to justify investment if the full potential of the new media is to be realised.

A national collaborative effort will guarantee that digital resources will be educationally sound and of the highest quality. No single state can provide this investment nor establish conditions as attractive to industry as a national market can provide. A national effort is also more likely to ensure equity of access by aggregating, for example, rural markets.

6. CURRENT DEVELOPMENTS

There are a number of initiatives that come together in this proposed strategy.

Commonwealth Action Plan for the Information Economy

In the development of the Commonwealth Action Plan for the Information Economy, the schooling sector, along with the Higher Education and Vocational Education and Training sectors, has reiterated the need for an integrated approach to infrastructure, professional development and content to achieve the required educational outcomes as well as the potential arising from the key role of education in the information economy.

The School Education Action Plan for the Information Economy

The School Education Action Plan for the Information Economy has been developed by the EdNA Schools Advisory Group within the context of the Commonwealth Department for Education, Training and Youth Affairs *Action Plan for the Information Economy.* Both these documents record and contextualise the need to generate substantial on line content. This Strategy takes forward the on line content component of *The School Education Action Plan for the Information Economy.*

EdNA Online

EdNA Online continues to develop a wide range of links to educationally relevant content (currently 9400 evaluated links and 242 000 indexed links), schemas for managing and accessing this content, as well as services that increase accessibility and value. Both usage of EdNA On line and its capacity to manage storage and access continue to grow. This provides a framework for accessing new on line content. In EdNA Online Ministers have intellectual property relating to the implementation of distributed collaborative standards and frameworks that can be applied in the digital content market environment. EdNA also provides one potential model of an Australian education gateway.

EdNA Standards

The EdNA networks have achieved sign-off on an EdNA Metadata Standard. This is the base standard for the Australian education and training community within an international as well as a whole of government framework. This standard makes possible the efficient and effective management and sharing of educational resources across sectors, states and territories. Work is underway to extend the EdNA Metadata Standard into a fuller information management standard, one of the critical factors for an Australian digital content market. While significant work needs to be done to further develop and market the standard, the work achieved to date places Australian education in a strategic position in relation to an on line content industry.

Curriculum and Pedagogical Standards

The national curriculum work over the last twenty years in major content initiatives such as NALSAS, Civics and Citizenship education, Studies of Asia, and literacy and numeracy has generated significant intellectual property in curriculum standards, curriculum equivalence between Australian states and territories, successful teaching and learning strategies and instructional design. If this intellectual property can be systemised and wedded with the emerging information management standards being pursued through EdNA, Ministers will be strategically placed to provide a framework in which standards can be assured, monitored and adjusted. This is a prerequisite to market confidence for both teachers and digital content suppliers and creates the environment in which supply and demand can operate within government monitored educational standards.

Sharing of educational material

CESCEO has commissioned an issues paper, *Development and Sharing of Educational Materials in the EdNA Environment.* This paper to be completed by the end of 1999 will describe likely models for schools systems to share materials they own and jointly produce. These include applications for distance education, classroom learning and private study. The paper will also analyse issues relating to the management of intellectual property rights associated with the models of shared usage and joint development. It will also consider the role of EdNA Online in facilitating shared use of educational materials, and the role of the private sector. The nature and volume of intellectual property likely to be the subject of shared use and joint development by Australian school systems will be assessed and recommendations for further action by CESCEO and its members will be proposed.

National Collaborative On line Science Project for the Middle Years 5-8+

Education Victoria is proceeding with a substantial project to produce prototype on line content for middle years science. This product is being developed in a collaborative way with involvement from state and territory education systems in Australia under the management of Curriculum Corporation. It will provide proof of concept models to assist the further development of nationally collaborative on line content.

Other projects

A number of projects are seeking to share developed materials in a way that allows reuse of existing materials from education systems, cultural institutions and archives. In addition there is a number of projects, some funded by the Commonwealth, involved in investigating issues relating to on line content development.

The *NATCOM* projects, for example, are using an action research approach to facilitate new methodologies and tools for on line content development; and the *National Materials Development Network* has responsibility for national development and production of student materials for distance education and has experience in developing on line content relating to distance education. The *Open-It Project* is developing extant print materials for years K-12 for delivery on line; digitising library and archive materials, as well as acquiring courses and courseware for TAFE application.

In addition, the work of AE ShareNet and Higher Education sector on line content initiatives provide useful models and understandings that can be applied to the development of on line content for schools.

7. STRATEGY

The Strategy proposes establishing a national framework and market for high quality online curriculum content for Australian schools. This Strategy will require a substantial resource commitment over an extended period of time. An initial phase to develop a detailed Business Plan and Quality Assurance Framework within this current budget cycle is proposed.

PHASE 1

Components

Business Plan
A fully costed Business Plan will be developed in consultation with public and private sector stakeholders to inform Ministers of the most appropriate models for generating on line content for Australian schools.

The Business Plan will include an analysis of the risks and benefits of generating on line content for Australian schools, the state of the market, the industry context, financial models, and investment structures. Specific focus areas will include:
▪ the extent of public intervention required to generate curriculum content for Australian schools;
▪ nationally-agreed strategic curriculum areas requiring content generation;
▪ the potential of education portals to attract strategic content providers;
▪ the need for significant content development in light of an apparent growth in content providers;
▪ the extent and nature of existing Australian and overseas digital curriculum content and its appropriateness for Australian schools;
▪ growing the domestic market for nationally developed on line content;

- competition between states and territories and the range of drivers and models for national collaboration;
- the sustainability of an on line content strategy;
- the value and possibility of attracting and stimulating private sector investment;
- maximising the benefits of public sector funding;
- supporting the establishment of an Australian industry in the development and marketing of digital resources for schools;
- maximising the opportunities for international cooperation in funding and development of the materials;
- maximising the opportunities for international sales;
- advertising and e-commerce on line; and
- models of successful national quality assurance mechanisms.

Quality Assurance Framework

Associated work will be conducted on the development of a Quality Assurance Framework to ensure what is delivered into the Australian educational market is high quality. This will include standards and protocols that will support the growth of a public and private sector marketplace in on line content generation. They will be established in the following areas:

Information management including metadata
The full development of educational use of ICT relies on the effective use of resource discovery tools, information services, linkages between information services and collaboration tools. The EdNA Metadata Standard will be extended and tools developed. Storage and management protocols will also be established to enable easy, flexible re-use of content.

Pedagogical approaches and instructional design
The use of digital technology in ways that enhance teaching and learning is critical to this Strategy. The generation of on line content involves far more than putting a book on line. It is about developing activities and tools that promote student engagement within a learning process.

Nationally approved pedagogical standards for on line content will be required by public and private providers to enable them to enter the Australian market. While all Australian education systems use outcomes as a basis for their curriculum, the form of outcomes is somewhat different, and the relationship between these and curriculum content is articulated differently. State and territory curriculum outcomes will be collated and interoperability mechanisms developed to enable local access to content. Agreed pedagogical approaches appropriate to the curriculum policies of states and territories, will also be defined.

Copyright and intellectual property (IP) management
Protection of ownership of copyright and third party material which is not the property of the supplier or the end user, is currently the subject of proposed legislative changes. Common agreed procedures for sharing intellectual property of individual education systems will be proposed through the CESCEO Sharing of Education Content project, to be completed in mid December 1999. A nationally

agreed implementation strategy involving both copyright and IP management will be developed.

Research
International and national research relating to the impact of ICT on teaching and learning will be collated, monitored and made available through EdNA.

Management

Curriculum Corporation will establish a project steering committee, reporting to CESCEO and Ministers via the Curriculum Corporation Board to oversee the development of a fully costed business Plan and associated work.

The Project Steering Committee will include representation from Education.Au and undertake its brief in consultation with leading information technology and on line delivery specialists.

Phase 1 will be managed by Curriculum Corporation using a collaborative model and will involve commissioning specific work from appropriate agencies. The Quality Assurance component on information management will be developed by Education.Au.

Deliverables and timeline

Phase 1 - (December 1999-July 2000)

Deliverable	Completion date
Development of a fully costed Business Plan.	mid-January 2000
Associated work: EdNA Metadata Standard for schools sector application.	30 June 2000
Nationally agreed pedagogical approaches , collation of outcome statements and development of an interoperability mechanism to enable local access to content.	30 June 2000
A nationally agreed implementation strategy involving both copyright and IP management.	30 June 2000
International and national research collated, monitored and made available through EdNA.	30 June 2000

8.   BUDGET

Project	Budget
Development of Business Plan	$200 000
Project Steering Committee and project management	$ 50 000
National school metadata development	$120 000
Pedagogical approaches, collation of outcome statements and tool development	$ 80 000
Copyright and IP management implementation	$ 30 000
Collation and posting of research	$ 20 000
TOTAL	**$500 000**

9.   FUNDING

The funding for Phase One of the Strategy will be contributed using the ACER formula for Commonwealth/State/Territory contributions.

In addition, individual States, Territories or the Commonwealth may wish to initiate projects and invest additional funds in on line content development. The Strategy also recognises that content will be developed outside the nationally agreed funding mechanisms (eg. through existing projects such as NALSAS).

Generation of high quality digital content is expensive. The Business Plan will identify detailed costings, but an investment of $60-$70million in the first three year period is likely.

RECOMMENDATIONS

The educational and economic benefits of information and communication technology will only be fully tapped if Australian schools have access to a rich array of digital curriculum resources, and if an Australian industry for producing and maintaining such materials is strengthened. To achieve these aims it is proposed:

That Ministers:

1. Support a strategy to stimulate an Australian market for the generation of quality on line curriculum content for Australian school education.

2. Agree in principle to the establishment of a major project to generate on line curriculum content for Australian school education.

3. Agree to establish a project Steering Committee reporting to CESCEO and Ministers via the Curriculum Corporation Board to develop a fully costed Business Plan and undertake associated work.

4. Agree to provide an initial budget of $500 000 for the project from 1999/2000 budgets through the ACER formula for Commonwealth/State/Territory contributions.