



schools online curriculum content initiative

REVIEW OF THE LE@RNING FEDERATION MARKET LINKAGES - PHASE TWO

Convergent

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... when decisions matter

A report by Convergent Consulting

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1. Executive Summary

The aim of this review was to focus on answering four key questions, outlined as follows:

1. How has the multi-media market shifted in the last 12 months (since the last review) both nationally and internationally?

We found that the Australian multimedia market, in general, had picked up substantially over the last 12 months, driven largely by a rebound in corporate sector demand. In the learning sector, virtually all new growth was being driven by the training and certification requirements of the business sector, with little new work from the K-12, VET or Higher Education sectors. A potential future effect on the schools sector, of this recent pick-up in growth, will be that current TLF suppliers will be in greater demand – leading to the potential of higher pricing (as the profit potential is considered to be greater on corporate jobs) and/or a shortage of resources for future school sector work.

The UK was the only international market identified as possessing material growth in K-12 digital curriculum resource development. This growth was being underpinned by the increased commitment of the public sector, and by the entry of the BBC into the market. The BBC's aggregated procurement approach, commitment to open standards (SCORM and IMS) and its usage of private sector developers, shares many of the same characteristics as the TLF's approach. Where the BBC initiative will be very different to TLF is that it will bypass the schools system altogether and exclude the provision of teacher-focussed courses - concentrating instead on establishing an interactive dialog directly with learners.

Broadly speaking, in the USA, the K-12 digital content market continues to focus on assessment and in automating the existing learning paradigm (i.e. the electronic classroom). However, the advent of Virtual Schools, while not being a mainstream solution for introducing e-learning into the regular classroom, will impact the overall shape of the K-12 e-learning market, as well as provide some useful lessons into what can be achieved in a dedicated online teaching environment.

We also identified three key global trends and developments, that we expect to impact future strategies in the development of curriculum content and its distribution and usage in the schools system. These trends and developments were:

- Teachers and students will actively gain access to digital curriculum content from a number of potential sources (both inside and outside the school systems);
- The barriers restricting the global development and exchange of curriculum content are eroding; and
- There continues to be little direct investment in K-12 digital curriculum materials.

2. Has The Learning Federation adapted to any shifts in the multi-media market?

The TLF has adapted to shifts in the market in a number of ways, including:

- **assisting content developers become globally competitive.** This has been achieved through improved productivity, lifting local skills and capabilities, and on concentrating activities around 'best in breed' suppliers. This outcome is vital, as it will assist Australian developers compete in an increasingly competitive international environment (as per our view that the barriers restricting the global development and exchange of curriculum content are eroding.)
- **broadening the potential sources of content available to schools.** TLF have commenced negotiations and dialog with Australian cultural institutions (e.g. the National Library), overseas

education authorities, Australian education authorities; and private developers. While this procurement model is more commercially complex, and may result in less content being manufactured by TLF's suppliers, we believe it is a sound approach that will eventually lead to greater levels of innovation and efficiency of use with digital curriculum resources.

3. To what extent is The Le@rning Federation supporting the online development industry in working with schools?

As described in the Phase 1 report, by most measures, TLF has met, or exceeded, in developing the market linkages it set out to achieve during Phase 1.

One area highlighted in the Phase 1 report, as needing development, was the management of intellectual property rights (IPR). While much work has since been completed over the last 12-18 months on this issue (e.g. rights now vested with the JV, and the commissioning of the TVG Report), none of it would appear to have moved to a stronger conclusion for market suppliers. The suppliers interviewed in this Phase 2 process still felt that IPR ownership was unclear and that their position was not firm enough to make any investment decisions around exploiting the content further, or to even use their TLF developed content to display to potential overseas clients. Having said that, this consultant did not receive a strong message that these IPR issues were restraining suppliers to any great degree. We also recognise that the market for digital curriculum content is very immature, and that making firm licencing decisions at this time carries a large element of risk for all parties.

A few issues, not highlighted in Phase 1 as being a concern, but were raised by suppliers in Phase 2, were issues around instructional design and accessibility. With regard to instructional design, two suppliers felt that the standard process of testing learning objects with students, by a third party, who then provided feedback-reports is not ideal. Both felt that it was important for developers to see first hand the emotional and cognitive response of students while developing their content, and that reports tended to filter much of the this important qualitative information.

With regard to accessibility requirements, one supplier felt the lack of pragmatism displayed by TLF will mean that the content will end up being less accessible in the long run. For example, he pointed out that by designing content for the 'lowest common denominator' could mean that the content is compromised so much that it will be attractive to no-one.

Another area of major activity during Phase 2, were the national workshops held in conjunction with AIMIA. By all accounts, these workshops were well received by industry participants, and were felt to provide attendees significant technical and market knowledge.

The new Phase 2 clustered tendering process, has both reduced the number of suppliers and improved the efficiency of the procurement and resource allocation processes for suppliers. Suppliers also commented that project management, QA and testing processes had also significantly improved since Phase 1 and that this both improved their profitability and ability to produce better content.

4. What implications are there in current directions or trends for schooling sector market linkages beyond 2006?

We believe there are three key areas in which stronger, or redefined, market linkages could benefit both the education sector and industry. These are:

i. Developing an applied research program into the fundamentals of e-learning

There are three areas of applied research that the K-12 education sector, suppliers and potentially other research institutions, such as the CSIRO and universities, could collaborate on. These are broadly described as:

- justifying the effectiveness of e-learning;

- improving the effectiveness of e-learning; and
- improving instructional design tools and processes.

Suppliers and experts interviewed not only believe this basic R&D would be valuable to exploit outside Australasia, but also believe it would improve the educational outcomes achieved within Australasia.

ii. Developing an implementing program for integrating digital curriculum content into the schools system

Most Education Authorities (EAs), are viewed as being significantly under-prepared and under-resourced for the massive undertaking of deploying and integrating digital curriculum content into classrooms.

This concern was not so much around ICT infrastructure per se (or lack of), but more around:

- the professional development of teachers;
- the ability of teachers to develop and re-shape content for their own needs;
- the support services teachers would require in order to blend e-learning with regular curriculum;
- the ability to select and procure appropriate service and support from the private sector; and
- the development of over-arching and supportive e-learning policies and procedures.

Given the scope of the task, a potential way forward, that would both aim to minimise the duplication of resources across EAs, and to harness the skills and capabilities of industry, would be:

- to shift the ambit of TLF to take on a leadership role in this implementation process across Australia and NZ. In this role TLF would address most of the above issues, and would be responsible for issuing policies and leading the education sector towards best practice. In many ways this would be a similar role to that played by BECTA in the UK;
- deploy the private sector resources and capabilities in order to supplement the skills and resources shortage evident in the schools sector.

iii. Facilitating the bundling of TLF content with other learning system components

There is likely to be a market for the use of digital curriculum material outside the traditional classroom environment. This may be in the form of a direct interactive dialog with learners, or through an intermediary institution, such as a Virtual School, or private college. Given that this market development is likely to occur, regardless of the school sector's success or otherwise in integrating digital curriculum into the classroom, then it would be better that this market development be embraced, and shaped, so that it best compliments the school sector's e-learning goals and strategies. Collaborative linkages with the private sector would greatly enhance and facilitate this objective.

2. Introduction

2.1 Overview of The Learning Federation

The Le@rning Federation is a collaborative initiative of Australia's State, Territory and Commonwealth governments and the New Zealand government. Managed by a joint venture between **education.au limited** and Curriculum Corporation, the initiative has a total budget of approximately \$72 million for the period 2001-2005. \$34.1 million of this total is funded through the Commonwealth of Australia's *Backing Australia's Ability: Innovation Action Plan* on a matching funds basis with all Australian States and Territories. These initial funds were supplemented in 2002 by an investment from the New Zealand government of \$4.7 million.

The Le@rning Federation initiative is designed to achieve five key objectives. These are to:

- develop high quality online curriculum content in priority areas for use in Australian and New Zealand schools
- create a framework for distribution of that content to State and Territory gateways
- develop materials that represent the best education available or conceivable in the early twenty-first century – such materials will engage teachers and students in the construction of learning and in creative and critical thinking
- support the innovation, enterprise and knowledge economy priorities of State, Territory and Commonwealth governments in Australia, and
- encourage a marketplace for high quality public and private online curriculum content.

2.2 Terms of Reference of this consultancy

The Le@rning Federation (TLF) commissioned this consultant to review progress in relation to market linkages, since the completion of Review of Market Linkages Phase One report. The aim of this review is to focus on the following questions.

- How has the multi-media market shifted in the last 12 months (since the last review) both nationally and internationally?
- Has The Le@rning Federation adapted to any shifts in the multi-media market?
- To what extent is The Le@rning Federation supporting the online development industry in working with schools?
- What implications are there in current directions or trends for schooling sector market linkages beyond 2006?

2.3 Outline of Methodology

Our approach uses, as a baseline, the analysis completed as part of Convergent Consulting's Phase One study. From this baseline, we have conducted the review along the four key phases outlined in the diagram below.



During the review process we have utilised four sources of information and reference:

- I. Feedback from Suppliers;
- II. Feedback from external experts;
- III. Feedback from TLF staff; and
- IV. A literature search;

External literature specifically referred to in the text of this report is referenced in the footnotes, while literature that has more generally informed the consultants market opinions and predictions, is referenced in the Bibliography in Section 7. The individual and companies consulted during the course of the study are outlined in Figure 2.3.1.

Figure 2.3.1 The Three Sources of Information used to Assess TLF's Market Linkages

Information Source

Individuals/Companies

TLF Content Suppliers

- David Hegarty (CADRE)
- Matthew Angle (Qantm)
- Russell Yardley (Acumentum)

Non-TLF suppliers, international and Australian e-learning experts, and industry representatives

- Bill Muirhead (University of Ontario Institute of Technology, Associate Provost Learning Technologies)
- Mark Pearce (The Workshop, UK)
- Ian Nicols (XSIQ)
- John Butterworth (AIMIA)
- Loise Van Rooyen (AIMIA)
- Collin Bell (Corcord)
- Stephen Cassidy&Christobel Wright (DCITA)

Learning Federation Management

- Susan Mann (COO)
- Stuart Tait (Manager Market Information and Research)
- Nigel Ward (Interoperability Analyst)

3. How has the multi-media market shifted in the last 12 months (since the last review) both nationally and internationally?

3.1 Broad Market Overview

In this sub-section we provide an overview of three geographic markets: Australia, the UK and the USA.

We have chosen to concentrate on the UK and the USA markets for reasons similar to those outlined in the Phase 1 report. That is, these markets are likely to be the most important for Australian multimedia developers due to their sheer size, because language and cultural barriers are smaller, and for the fact that they are most actively focussing on content development, while other areas such as Asia and continental Europe focus on infrastructure and teacher development issues respectively. Having said that, we note, some specific countries such as Singapore, France and Canada do possess content development programs, however, they are relatively modest in size and, so far, are not seen as having a major impact on the shape of the global K12 market for digital content, nor on the opportunities available to Australian developers.

3.1.1 The Overall Australian Multimedia and Digital Content Market

The peak industry body, the Australian Interactive Media Industry Association (AIMIA), as well as the TLF suppliers interviewed, report that the general multimedia market has picked up substantially in Australia over the last 18 months. There is also strong expectation that this growth will continue for the foreseeable future. In particular, the corporate market has developed quickly for multimedia suppliers.

Specific areas identified as fuelling this growth were:

- mobile content and applications;
- advertising and marketing products;
- substantial regulatory changes requiring training and certification (e.g. FSRA, OH&S, health and security);
- corporate 'knowledge management';
- entertainment/games; and
- rising broadband penetration driving new forms of applications (e.g. Interactive TV, games).

AIMIA reports that many new companies are entering the market again and are tending to focus on particular niche areas. This phenomena is anecdotally demonstrated by AIMIA's 50% increase in membership, 60% increase in the annual awards applicants and a 60% increase in the number of award categories over the previous year.

In the corporate education market interviewees noted that new regulations in the financial services industry (i.e. The FSRA), OH&S and Health industries provided a real boon in demand for training and certification type activities. By contrast, in terms of new content projects, the 'public' education markets of the higher education, VET and schools sector have been relatively static over the last 12 months. Few, if any, substantial initiatives outside TLF and the VET sector's Toolbox project have been initiated.

One potential future effect on the schools sector, of this recent pick-up in growth, will be that suppliers will be in greater demand – leading to the potential of higher pricing (as the profit potential is considered to be greater on corporate jobs) and/or a shortage of resources for future TLF work. We point this out as it should be worth remembering that closely coinciding with the birth of TLF, in 2001, the Australian multimedia and digital content market suffered a significant drop off in demand following the 'dot-com' collapse of that year. Demand for multimedia development of all types (e.g. e-learning, web-sites, advertising, e-commerce solutions etc) fell across the board.

3.1.2 The UK Curriculum Online Project

As identified in the Phase 1 report, the Curriculum Online schools project in the UK provides an interesting contrast to TLF (Please refer to the Phase 1 Report for an overview of this project.) Since writing the Phase 1 Report a number of developments and observations about the project are now apparent.

Firstly, the UK Government and the relevant educational bodies are increasing their commitment to the scheme. In its report to the Secretary of State, in mid 2004, on the performance of Curriculum Online, the Content Advisory Board (CAB)¹ expects that spend on digital learning resources in UK schools will grow from £50-65m in 2002/3 to £70-80m in 2003/4 and £100m in 2004/5.

Secondly, while the e-learning credits scheme² (eLCs) has led to a significant increase in e-learning products purchased, it would appear, so far, it had limited success in:

1. the commissioning of digital content,
2. promoting efficient procurement by schools, or
3. stimulating new opportunities for multimedia companies that were not already traditional publishers/suppliers to schools.

For example, in its report, CAB makes the observation that 61% of eLC spend goes to 10 companies (2% of registered companies). It also notes that most spend is going into a very limited number of products that mostly existed prior to the introduction of eLCs.

“One of CAB’s conclusions to date is although eLCs have had an impact on the market, they have not led to a major change in product investment or quality.”¹

In other words, the major publishers would appear to be selling e-learning products that existed prior to 2001. This is particularly easy to do as there appears very few restrictions in the scheme that requires publishers to develop any new digital curriculum resources. (Much like Australia most of the UK ICT material is currently distributed on CDs, videotapes and DVDs). As one UK based multimedia supplier commented, “so long as it’s viewed on a computer screen it’s considered e-learning”.

CAB also believes that this concentration of spend amongst a small number of incumbent suppliers and products suggests that an aggregated procurement approach would improve value for money. From this CAB conclusion, it would appear that, many schools and local educational authorities do not possess the skills and/or inclination to aggregate and define their digital curriculum needs - so instead default to the products offered by the major publishing houses.

In fairness to the eLC scheme it would be difficult to evaluate its absolute success, or otherwise, at this relatively early juncture, especially in considering the ambitious nature of the scheme in attempting to ‘empower’ the demand-side of the market (i.e. the teaching fraternity). There are certainly some attractions in this nation-wide scheme, that should it be successful in overcoming the above three shortfalls, then it would become a very attractive model to consider.

Thirdly, a very significant development has been the introduction of the BBC into the K-12 digital curriculum market with a ‘free service’ for learners. While, this initiative was strongly opposed by the private sector developers, after an extensive and protracted review, it was decided by Government that the BBC would be allowed to participate in the market, provided certain guidelines were followed. The most important of these guidelines for industry was that the BBC must not cover more than 50% of curriculum outcomes and that the BBC must outsource at least 50% of its development to the private sector.

In some ways, the BBC’s initiative will share some of the same characteristics of the TLF’s approach to producing content. That is, an aggregated commissioning approach to providing high quality digital

¹ Content Advisory Board Report (May 2004, UK) on the performance of Curriculum Online

² Schools are individually provided budgets and authority to purchase e-learning materials

curriculum, a commitment to open standards (SCORM and IMS), a high involvement from private sector developers, and a centralised distribution platform (e.g. the BBC web-site).

Where the BBC initiatives will be very different to TLF is that it will bypass the schools system altogether.

“the BBC will exclude the provision of teacher-focussed courses concentrating instead on establishing an interactive dialog directly with learners while leaving scope for parents, carers and teachers to mediate resources.”³

This pedagogical approach represents a radical change to the existing UK strategies where most attention was directed at integrating and blending e-learning with existing classroom based teaching approaches.

The BBC’s market entry will be very interesting to watch as it sub-divides the entire UK schools strategy. Broadly speaking, half the curriculum will be now be commissioned and funded by a central body (the BBC) and will be distributed independently from schools. On the other hand, the other half of the curriculum will be purchased under the highly decentralised eLC scheme, and will be distributed and used directly within the schooling sector.

3.1.3 The US Market

As commented in the Phase 1 Report, the US market has essentially left the funding and development of digital curriculum content and applications to the private sector, with little evidence of any substantial public sector funding or interventions. Notwithstanding, a number of important trends and developments in this market have become more apparent over the last 12 months.

Driven by the assessment requirements of the *No Child Left Behind Act*, and historical educational biases in this direction anyway, most digital content development within schools continues to be focussed on assessment and classroom management activities, such as student record keeping and online access to classroom enhancing resources (e.g. class notes, lessons plans, chat rooms etc.) – as opposed to genuine interactive digital content. A result has been that many private sector firms, such as BlackBoard, have successfully focussed on developing products for these types of school applications.

Another trend to emerge is the introduction and rapid increase in the number of ‘Virtual Schools’. It is estimated that there are at least 90 cyber-chartered schools in operation and that about 300,000 students participated in an online learning program⁴. In essence, virtual schools bundle online curriculum content with complete learning services and systems to provide a complete educational institution online. Virtual Schools are being operated at a national, state and school district level by state education agencies, schools districts, private enterprises, non-profits, and universities.⁵

Virtual Schools provide for a variety of possible modes of access including:

1. Off-site School. Under this model a student accesses the Virtual Schools from a place of their own choosing – most often being the home. This option obviously works well for older students who can work well without supervision.
2. On-site Virtual School. This model is essentially a “School within a School” where students take one or more online courses with a dedicated facility in a traditional school setting
3. Dedicated off-site facility. Online learning is conducted at a separate facility, such as a community centre. A teacher, or manager, is onsite to help monitor students, but most instruction would be online.

While some Virtual Schools programs allow students to earn a high school diploma entirely online, in the vast majority of cases students take online classes to supplement or complement their education.

³ BBC Website www.bbc.co.uk/info/policies/digital_curriculum.shtml

⁴ Edevntures, as reported in www.ltimagazine.com

⁵ Increasing Options through e-Learning, US Department of Education Secretary’s No Child Left Behind Leadership Summit

In February 2004, the Bush Administration endorsed Virtual Schools as a legitimate way for school districts to satisfy one key aspect of the *No Child Left Behind Act*, which requires giving students options if their school is deemed under-performing, or if the local school could not provide the curriculum choices being sought.

A distinct advantage of Virtual Schools, over traditional schools providing an e-learning environment, is their potential for superior cost-economics and 'speed to market'. Virtual Schools run at a comparative advantage in that they can defray the cost of online curriculum content, instructors, technology platforms and software applications across students internal and external to the regular school district. Also, because Virtual Schools focus on online education only, and possess the skill and resources to support this activity, they can, in most cases, be expected to provide a service much more quickly than it would take an under-resourced educational institution.

There is no doubt that Virtual Schools have their critics, and there is little suggestion, even from the strongest advocates, that Virtual Schools will play much more than a 'niche' role in the entire scheme of K-12 education delivery. However, we believe that Virtual Schools are worth monitoring as they will, by their nature, be leading the development of fully online e-learning experiences.

3.2 Teachers and student's will gain access to digital curriculum content from a number of potential sources

It is becoming increasingly apparent that students and teachers will be able to obtain digital curriculum resources from a wide range of potential sources.

There are two key reasons for believing this, both of which are inherent in the nature of digital resources and multiplicity of learning/teaching styles.

1. Digital resources are inherently distributed and will therefore be capable of being delivered by multiple service providers.
2. Users (teachers and learners) do not all want to access information in the same way but will require a diverse range of views of resources in order to satisfy their needs.

There is also a view that teachers themselves will be authoring learning objects. For example, the EU's CELEBRATE project makes this a specific objective, and has developed templates and procedures to enable European teachers to achieve this.

As EAs, schools and individual teachers start to make their way down the road of reusable and shareable learning objects they will also face choices on how to store, locate, and share this content. They are then introduced to the field of Learning Object Repositories (LOR), or more generally digital content repositories. Repositories based on open source software allow material, which is utilised by a learning tool, environment or application to be separate from the application itself (e.g. a LMS). This allows for easy authoring, updating, archiving, retrieval, sharing of such material between multiple users. In Australia, the tertiary sector COLIS project leads the way in developing a repository for tertiary institutions.

It is anticipated that most repositories for the K-12 sector, will of course, be managed by the local education authorities and be specifically designed for commercial and operational use within the schools system. (For example, the Teaching and Learning Exchange (TaLE), is the 'official' repository for the NSW Department of Education.) However, as teachers begin developing and exchanging their own curriculum content, it is possible that at school level, district level, or subject area type repositories will form. This phenomena is developing in the EU with the CELEBRATE initiative and in a number of duristrictions within the United States. Further, digital repositories for important cultural institutions, such as the National Library and National Archives are also under development and will also likely be desirable sources of content for schools to access.

The evolution of the BBC's 'direct to home' model, and the rise of Virtual Schools in the USA, are also illustrative of the fact that curriculum content will also reach students by potentially by-passing traditional schooling systems, and open access digital repositories altogether.

In our view, this development is being driven a number of factors including:

- schools lagging behind the general community in regards to access to ICT skills and infrastructure;
- the steady 'privatisation' of K-12 learning; and
- firms seeking to protect their own channels to market and propriety platforms.

Specifically, it is becoming increasingly apparent (at least in the developed countries) that much of the schooling sector is falling behind the rest of the community in terms of its access to ICT capabilities, such as broadband access, ICT equipment and ICT skills. Indeed, in many cases, a student's home with broadband access, a personal computer and computer literate family members will often be a superior environment for e-learning than the crowded, shared resource, of the local schools' ICT room. Couple this trend with the steady privatisation of education, where parents are increasingly willing to directly invest in their child's education, then it is clear that a potential market exists for curriculum content to be delivered outside traditional schooling systems.

Despite the push toward global standards and openly accessible learning object repositories, we believe commercial firms will continue developing their own propriety, or propriety like, distribution platforms for content. They do this not only to protect their copyright assets from potential illegal use, but also because these firms often see their market/pricing power being tied up in owning the physical distribution channels and the end-relationship with customers. This allows them to offer a 'complete solution' and to bundle in other products and services into their fee.

In sum, the conclusion here is that schools (and students) will face a wide variety of choices in where they source content and in how they choose to procure and manage the interfaces required to support an effective e-learning environment. The solutions and approaches are likely to vary with time and will be different for each school's needs.

3.3 The barriers restricting the global development and exchange of curriculum content are eroding

A number of developments suggest that digital curriculum materials will be jointly developed by multiple parties in multiple geographic locations. These developments include:

- **The lowering of technical barriers.** The use of standards, open source software, and the ease of which digital content can be stored and distributed means that there are very few technical barriers preventing the joint development and exchange of content by multiple parties in any location. Further, even if curriculum content is not deemed suitable for local use, the ease of re-authoring and re-purposing digital content means that many of the developers interviewed feel that digital materials could be readily adapted to meet local needs;
- **Potential cost advantages.** The digital content and multi-media development industry operates on a competitive global basis. Many multimedia firms in countries such as Australia, the UK and the USA are increasing outsourcing their 'back end' development work to lower cost countries, such as India. Indeed, one of the international e-learning suppliers interviewed claimed that some sort of partnership with a 'low cost' country was almost now mandatory for them to be able actively compete for work in their home country.
- **Teacher community exchanges.** As mentioned in the previous section, if e-learning is to become a vibrant part of the classroom environment, then the teaching community will need to also become active in the development of digital curriculum materials. These communities may well cross school, district, state and even international boundaries, and will not be so readily bound by political or over-arching policy boundaries.

Notwithstanding the above, as stated in a number of previous TLF commissioned reports, there are significant cultural, technical, pedagogical and political barriers to exporting K-12 curriculum content to other countries. As a general rule, while we believe that these barriers remain relatively solid, at least at an overarching political level, recent developments tend to indicate that they may be more easily overcome than first thought. In particular, we note that there are likely to be multiple 'gatekeepers', providing several alternative entry points into most markets. That is, any previous assumptions that national and regional level educational authorities would be the sole gatekeepers in determining the cultural, pedagogical and political appropriateness of imported digital content may not be as universal as first thought. For example, in the UK market, content developers/publishers could approach any of the LEAs, or even schools, to sell content and services. On the other hand, what would stop an Australian or NZ teacher suggesting to their students that, for their homework, they access the BBC's free digital curriculum materials, from the BBC web-site?

3.4 There continues to be little global investment in K-12 digital curriculum materials

Aside from the recent £150m+ investment by the BBC, there appears to be little evidence of any new initiatives (public or private) for the development of K-12 content of a similar high quality nature to that being produced by TLF. The AlbertaOnline initiative, identified as being most similar to TLF, appears to have stalled, or at least re-diverted its efforts into repurposing content for distribution.

This view is backed up by The European Commission:

*"There is a general consensus that there is a lack of European educational multimedia content coming from institutional, professional and industrial sources in education, publishing and educational software. After an initial phase of enthusiasm, often described as "hype", there are growing doubts about the real demand for educational e-content, and about its relevance for improving learning"*⁶

The net result is that Australia and NZ remain the clear leaders in developing quality curriculum content for use in schools. An obvious question then, is why are other countries so reluctant to develop content to a similar degree? While there is no unambiguous answer to this question, the suppliers, TLF staff and experts interviewed provided some perspectives:

One view was that none of the other countries have been able to achieve the same level of co-ordination and co-operation as the EAs in Australia and NZ had achieved. Thus these countries could not achieve the necessary scale to commission relatively expensive digital curriculum resources. This was particularly the case for countries that were leaving development exclusively to the private market (e.g. the USA), or who left it to the teaching community (e.g. many European Countries).

A second view was that most countries remain unconvinced of the effectiveness of e-learning (per the European Commission view) and on how it would be best implemented and integrated into existing classroom learning environments. So instead, they are not taking any 'major bets' and will instead bide their time with smaller experiments and research.

We believe there is likely to be a degree of truth in both these two views. As such, given the lead Australia & NZ has with its digital curriculum content, there is a significant opportunity for collaborative work between the private sector and education sector, in proving (and improving) the effectiveness of e-learning in schools. This opportunity is outlined further in Section 6.

⁶ European Commission Directorate-General for Education and Culture, Open invitation to tender No DG EAC 21/02 for the provision of services concerning the carrying out of studies in the context of the e-learning initiative.

4 Has The Learning Federation adapted to any shifts in the multi-media market?

The TLF has adapted to shifts in the market in a number of ways, including:

- assisting content developers become globally competitive;
- broadening the potential sources of content available to schools.

4.1 Assisting Australian content developers become globally competitive

This has been achieved through improved productivity, lifting local skills and capabilities, and on concentrating activities around 'best in breed' suppliers.

4.1.1 Lifting overall productivity levels

Given the high cost of producing quality based digital curriculum, and the increasing global competitiveness of content production, it is vital that TLF continues to improve productivity of content production in Australia. This will also enable the schooling sector here to secure well priced content and to have the best possible benchmark in which to make future purchasing or content-swapping decisions with the international market.

Improved productivity also has positive flow-on effects for both schools and Suppliers, in that it can increase the amount/quality of output per dollar spent (for schools) and improves the profitability of the project from the Suppliers perspective.

According to the interviewed Suppliers, TLF has considerably improved the efficiency and effectiveness of most aspects of development processes since Phase 1. Most mentioned that overall compliance or overhead costs, for procurement, design, production, project management, QA and testing have fallen considerably.

4.1.2 Lifting local skills and capabilities

As reported in the Phase 1 Report, suppliers believed that their involvement with TLF had considerably improved their ability to produce quality curriculum content. This in turn, impacted positively in their ability to secure other development opportunities both locally and overseas.

Again, during this Phase 2 study suppliers felt that the skills and capabilities acquired through their involvement with TLF projects had continued to be important in helping them win additional work. Interestingly, this time around, a few of the suppliers had also begun imbedding a number of TLF's workflow processes into their company wide systems. In particular they felt the instructional design and testing processes were 'best practice' and could be applied across many sectors and clients.

TLF spent considerable resources during Phase 2, on training and developing supplier staff on the process of developing of digital curriculum resources. This training was provided 'free' to suppliers, and formed part of the collaborative relationship. Over 200 people attended these training sessions.

4.1.3 Consolidated the number of suppliers

In the transition from Phase 1 to Phase 2, TLF reduced the number of suppliers (developers) from over 20 down to 15. The rationale for this consolidation was that it would reduce TLF's production costs, and allow for better resource planning and collaboration between TLF and suppliers.

We also believe such a consolidation is a good response to shifting market conditions. Firstly, the greater concentration of spend through a smaller number of larger and 'best in breed' suppliers will provide them a better chance to gain some economies of scale, and compete on an international

basis. Secondly, as mentioned in Section 3, the multimedia market is picking up and alternative commercial opportunities will be developing for TLF's suppliers. Again, by concentrating on a smaller number of known and 'preferred' suppliers, the transaction costs and project risks for both TLF and suppliers can be reduced.

4.2 Broadening the potential sources of content available to schools

The initial (and still predominant) content procurement model is for TLF to manage the production of its own content (although still outsourcing the technical development component to industry). This model has the advantage for TLF of being able to quality assure the outcomes, especially with regard to technical and pedagogical standards.

The main limitations of this closed model are that it is a single method of production that is not necessarily exposed to being compared with other alternatives, which may be more innovative, or more efficient. Further, because all content is produced 'from scratch' it does not necessarily build on the prior works of others.

In our discussions with TLF staff, it was clear that much work had commenced in broadening the original procurement model. These initiatives included exploring the sourcing and exchanging of content with:

- Australian cultural institutions, such as the National Library
- Overseas education authorities, such as the Specialist Schools Trust in the UK
- Australian education authorities, such as the Centre for Learning Innovation (NSW); and
- Private developers

While this procurement model is more commercially complex, and may result in less content being manufactured by TLF's suppliers, we believe it is a sound approach that will eventually lead to greater levels of innovation and efficiency of use in Australia's digital curriculum resources.

5. To what extent is The Le@rning Federation supporting the online development industry in working with schools?

As described in the Phase 1 report, by most measures, TLF has met, or exceeded, in developing the market linkages it set out to achieve during Phase 1 (Please Appendix A for a description). These expectations were based mainly around the two key strategic interventions required to overcome market failure, and to assist the future development of the industry. These two were:

- Establishing a Market Framework
- Kick-starting curriculum development through public funding

Establishing a Market Framework

Generally, we found that TLF had created a solid and robust Market Framework that clearly defined, to both the Supplier and User communities, the expectations for the development of quality online curriculum resources. Key aspects of this Market Framework, included:

- setting technical standards and frameworks (e.g. interoperability, accessibility, meta-tagging, etc.);
- setting instructional design standards and methodologies (e.g. defining learning objects, pedagogy design, etc.)
- specifying developmental and QA procedures (e.g. production management processes, user testing, etc.); and
- establishing a systems environment

One area highlighted in the Phase 1 report, as needing development, was the management of intellectual property rights (IPR). While much work has since been completed over the last 12-18 months on this issue (e.g. rights now vested with the JV, and the commission of the TVG Report), none of it would appear to have moved to a stronger conclusion for market suppliers.

The suppliers interviewed in this Phase 2 process still felt that IPR ownership was unclear and that they did not feel that their position was firm enough to make any investment decisions around exploiting the content further, or to even use their TLF developed content to display to potential overseas clients.

Having said that, this consultant did not receive a strong message that these IPR issues were restraining suppliers to any great degree. A few suppliers commented that no international client has yet, or is likely to, request the exact same TLF learning object and that, in any case, it was relatively easy to re-purpose or re-develop content to suit the specific needs of that client.

A few issues, not highlighted in Phase 1 as being a concern, but were raised by suppliers in this Phase were instructional design and accessibility.

With regard to instructional design, two suppliers felt that the standard process of testing learning objects with students, by a third party, who then provided feedback reports, was not ideal. Both felt that it was important for developers to see first hand the emotional and cognitive response of students in using their software, and that reports tended to filter much of this important qualitative information. One in particular felt so strong about this issue, that the company funded and conducted its own testing with 'live' students.

With regard to accessibility requirements, one supplier described some of the technical standards and expectations as bureaucracy for bureaucracy's sake. Indeed, he felt the lack of pragmatism will mean that the content will end up being less accessible in the long run. For example, he pointed out that by designing content for the 'lowest common denominator' could mean that the content is compromised so much that it will be attractive to no-one.

Another area of major activity during Phase 2, were the national workshops held in conjunction with AIMIA. These workshops were aimed at:

1. Creating a climate to capitalise on international opportunities;
2. Communicating important information on the standards, specifications and QA requirements of projects like TLF; and
3. Fulfilling TLF's broader market role

By all accounts, these workshops were well received by industry participants, and were felt to provide attendees significant technical and market knowledge.

Kick-starting curriculum development through public funding

In the Phase 1 report we commented that all Suppliers felt that TLF's uncompromising stance on adhering to IMS standards, learning objects, educational integrity, useability, accessibility, and QA means that the content produced was 'world class'. Further, each believed that their exposure to producing multimedia educational product, in accordance with such stringent standards and advanced methodologies, has been a very valuable learning experience which can be, and has been, used to win non-TLF development work, both domestically and overseas.

Another area of major achievement identified was the success of the TLF consortium model in aggregating the demand-side needs of the Educational Authorities (EAs). According to one international expert, no other group of separate Educational jurisdictions had been able to overcome the significant political, technical and logistical barriers that TLF has managed to achieve with this project. He believed this co-operation provides TLF significant scale advantages over most other international projects, and continues to possess to this day.

Notwithstanding these very positive outcomes, in the Phase 1 report, Suppliers expressed a number of concerns, including:

- their inability to achieve globally competitive 'economies of scale', as a result of development contracts being spread too thinly over too many Suppliers;
- their view that the proportion of TLF funding directly spent with multimedia Suppliers, on developing content, was small compared with funding for other tasks such as TLF's internal governance, project management, administration, and consultation processes amongst the EAs
- TLF's procurement and production management processes were inefficient and costly (although, Suppliers expressed optimism that these were about to improve);
- IP ownership arrangements were unclear and cumbersome; and
- competition between the public and private sectors for TLF contracts, distorts an 'efficient market'.

From our interviews with Suppliers in Phase 2, we believe good advancements have been made with many of these concerns.

Specifically, the new Phase 2 clustered tendering process, has both reduced the number of suppliers and improved the efficiency of the procurement and resource allocation processes for suppliers. A few suppliers also commented that there is much more collaboration with TLF when it comes to workflow planning and resource allocations over a project. This type of collaboration is a typical indicator of a more mature procurement cycle, where the customer (TLF) and preferred suppliers work collaboratively to improve efficiencies on both sides.

As mentioned in Sections 4.1.1 and 4.1.2, suppliers also commented that production, project management, QA and testing processes had also significantly improved since Phase 1 and that this both improved their profitability and ability to produce better content.

Notwithstanding these positive movements, suppliers believe there is still room for further refinement of work processes. An area of particular concern was the turnover of TLF production staff. Suppliers felt these TLF staff were key to the efficiency of most processes and that the turnover was a great loss of intellectual property.

6. What implications are there in current directions or trends for schooling sector market linkages beyond 2006?

We believe there are three key areas in which stronger, or redefined market linkages could benefit both the education sector and industry. These are:

6.1 Developing an applied research program into the fundamentals of e-learning

There are three areas of applied research that the education sector, suppliers and potentially other research institutions, such as the CSIRO and universities could collaborate on. These are loosely described as:

- justifying the effectiveness of e-learning;
- improving the effectiveness of e-learning; and
- improving instructional design tools and processes.

As mentioned in Section 3, there is a global reticence for K-12 education providers to invest in digital curriculum resources without further justification on the effectiveness of e-learning in producing better educational outcomes for students. Even in Australia, the metrics appear to be highly input-based (e.g. students per computer), or focussed on fairly non-attributable measures like retention rates.

Given the lead Australia and NZ now have in possessing relatively sophisticated digital curriculum content, specifically designed for classroom use, a number of suppliers believe there is a great opportunity to lead the way, not only demonstrating the effectiveness of e-learning but, also, in establishing the best way to integrate and blend e-learning systems with traditional teaching methodologies. Suppliers and experts interviewed not only believe this basic R&D would be valuable to exploit outside Australasia, but also believe it would improve the educational outcomes achieved within Australasia.

While the industry believes that much useful effort has been deployed by TLF in establishing technical standards and interoperability frameworks, TLF is not viewed as being equally advanced when it comes codifying its instructional design tools and processes. (Note, this seems to be the case globally and, in fact, TLF is probably further down the track than most its international counterparts.) However, there is a view that some collaborate R&D in this area would be of significant educational and commercial value.

6.2 Developing an implementing program for integrating digital curriculum content into the schools system

There is concern amongst a few industry experts that deploying and integrating digital curriculum into classrooms is a massive undertaking that appears to be under-resourced in most jurisdictions. This concern was not so much around ICT infrastructure per se (or lack of), but more around:

- the professional development of teachers;
- the ability of teachers to develop and re-shape content for their own needs;
- the support services teachers would require in order to blend e-learning with regular curriculum;
- the ability to select and procure appropriate service and support from the private sector;
- the ability to select and procure appropriate Virtual Learning Environment (VLE) software and applications; and
- the development of over-arching and supportive e-learning policies and procedures.

There is little doubt that this type of implementation is a huge long-term exercise, and it would seem that few, if any, EAs (Tasmania was raised as the possible exception) currently possess sufficient capabilities to execute on their own. Given the scope of the task, a potential way forward, that would both aim to minimise the duplication of resources across EAs and to harness the skills and capabilities of industry, would be:

- to shift the ambit of TLF (or the national variant thereof) to take on a leadership role in this implementation process across Australia and NZ. In this role TLF would address most of the above issues, and would be responsible for issuing policies and leading the education sector towards best practice. In many ways this would be a similar role to that played by BECTA in the UK;
- deploy the private sector resources and capabilities in order to supplement the skills and resources shortage evident in the schools sector. The most cost-efficient and effective deployment of private sector resources is likely to be achieved on a national basis, particularly, if it is guided by the policies, practices and specifications of the TLF in its expanded role.

6.3 Facilitating the bundling of TLF content with other learning system components

As articulated in this report (e.g. the BBC and Virtual Schools), there is likely to be a market for the use of digital curriculum material outside the traditional classroom environment. This may be in the form of a direct interactive dialog with learners, or through an intermediary institution, such as a Virtual School, or private college. In either case, there will be a requirement to bundle digital curriculum content with other learning systems components, such as assessment, accreditation, teacher dialog, student administration and so on.

Given that this market development is likely to occur, regardless of the school sector's success or otherwise in integrating digital curriculum into the classroom, then it would be better that this market development be embraced, and shaped, so that it best compliments the school sector's e-learning goals and strategies.

It is difficult to predict the timing and form of these initiatives, however, it might mean, for example, that TLF enters into a partnership with a commercial entity (or an enterprising EA) to create a Virtual School (or variant thereof) utilising the digital curriculum content produced under the initiative. In our view, the Australian Education sector will need to be alert to such opportunities, and that it seeks to avoid the potential negative outcome that the content produced by TLF gets 'locked' out of the opportunity, and that alternative (and most likely inferior) content is used as a substitute. Such an initiative would also ensure a good level of consistency across the schools system.

7. Bibliography

The Learning Federation Documents

“Approach to Managing Intellectual Property Rights”, July, 2004

“Industry Seminars, Report on the 2004 TLF/AIMIA seminar series”, 2004

“Intellectual Property Project”, by TFG International, July 2004

“Cost-effective options for online curriculum content beyond 2006”, July 2004

Market Information

“E-Learning and Sustainability”, www.ossite.org/Members/GrahamAttwell/sustainability/attach/sustainability4.doc , Graham Attwell, Pontydysgu for the University of Bremen, January 2005

“ASTD 2004 State of the Industry Report”, www.astd.org/astd/Research/about_research.htm
The American Society of Training and Development, 2004

“The 2003 e-learning readiness rankings”, www-306.ibm.com/services/learning/solutions/pdfs/eiu_e-learning_readiness_rankings.pdf The Economist Intelligence Unit and IBM, 2003

“What can virtual learning do for your school”, www.ltimagazine.com/ltimagazine/article/articleDetail.jsp?id=70677 , September, 2003

“Why open source makes sense for education”, www.opensourcesummit.org/open-source-200408.pdf
, the r-smart group, 2004

“Online schools clicking with students”, www.cnn.com/education , CNN Greg Botelho, August 13, 2004

“Enhancing Classroom Instruction”, www.blackboard.com/k12/
, BlackBoard Inc, 2002

“e-Learning Frameworks for NCLB”, www.nationaledechplan.org/documents/S.Collins-e-LearningFramework.pdf Susan R. Collins, KCH Strategies, 2004

Distance Learning at a Tipping Point, Critical success factors to growing fully online distance learning programs, www.eduventures.com/pdf/distance.pdf , Sean Gallagher, Eduventures, September, 2002

“BECTA Remit Brochure”
www.becta.org.uk/corporate/publications/publications.cfm?currentbrand=all&cart=, 2004

Key Data on Information and Communication Technology
in Schools in Europe, www.eurydice.org/Documents/KDICT/en/FrameSet.htm Eurydice, 2004

“The New Learning Paradigm in School Education”
http://elearningeuropa.info/index.php?page=doc&doc_id=5947&doclng=6&menuzone=0&focus=1,
elearningeuropa, Jan 2005

Appendix A : Description of TLF’s Market Linkages

In this section we describe TLF’s market linkages and the success measures that could be used to evaluate these linkages.

In the Trinitas Report, there were two key strategic interventions prescribed to overcome market failure and to assist with the future development of the industry. These were:

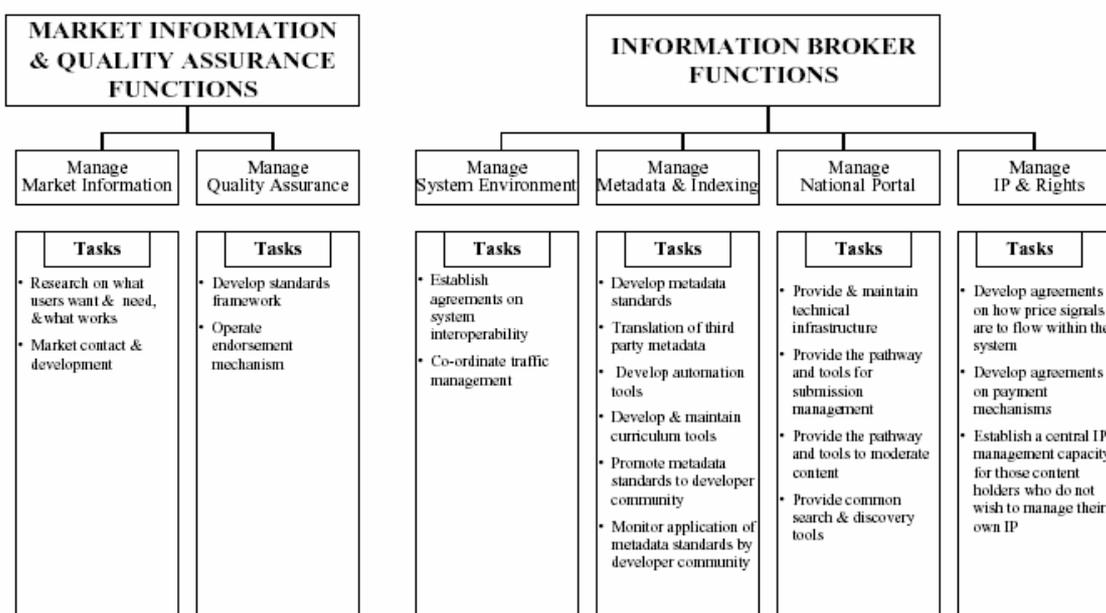
1. Establishing a market framework; and
2. Kick-starting curriculum development through public funding.

We believe these two interventions continue provide a useful starting point for describing the linkages and evaluating their impacts.

Description of the Market Framework

The Trinitas Report prescribed the establishment of a Market Framework, as broadly outlined in Figure 4.1. This framework required the establishment by TLF of ‘Market Information and Broker Functions’ and ‘Information Broker Functions’.

Figure 4.1 Trinitas Market Framework



In Trinitas’ view, by establishing this Market Framework, TLF would be able overcome the market’s failure by:

- delimiting a sufficiently stable market space to inform investment decisions;
- improving the sources and flow of market information;
- providing for quality assurance and safety;
- establishing and managing a system environment;
- improving access, and providing appropriate price and other signals to users; and
- allowing a flexible but robust rights management regime.

The Report also advocated the establishment of a publicly funded kick-start program that would provide for the:

- aggregation and specification of needs from the demand-side perspective (i.e. EAs);
- setting priorities for investment (i.e. subject areas);
- establishment of a procurement framework and management structure; and
- setting of standards for a systems environment (i.e. modularity, reusability, interoperability, custodianship and teacher control).

In establishing this kick-start TLF would be able to:

- accelerate the pace of development of digital curriculum resources;
- provide credibility with parents, teachers and in overseas markets;
- respond to demand from the private sector for clearer delineation of
 - priorities
 - expectations about quality and system environment
 - consensus on what constitutes good practice
 - an endorsement mechanism;
- encourage innovative and non-traditional investment including from potential participants who would be reluctant to take part without a public sector mandate;
- maximise structural adjustment gains from the public sector kick-starting the market; and
- support the emergence of an export market.