Evaluation 2001-2005 of The Le@rning Federation against its original terms of reference

Final Report
January 2006
The Le@rning Federation Steering Group commissioned this Report.
The Le@rning Federation Steering Group oversees the Initiative on behalf of the Australian Education Systems Officials Committee (AESOC).

Inquiries should be addressed to
The Report was produced by

TFG International Pty Ltd
ABN 25 096 722 879
Level 12
Gateway
1 Macquarie Place
Circular Quay
Sydney
NSW 2000
Telephone: +61 2 9251 3025
Fax: +61 2 9251 6326
Website: www.tfginternational.com
Email: info@tfginternational.com

Disclaimer

This Report has been produced based on information provided by a wide variety of persons and organisations associated with The Le@rning Federation and from past evaluations of the Initiative. While TFG International believes that the information has been provided in good faith and in a professional manner, this assignment has not provided for independent verification of the facts and opinions on which we have relied. The contents of this Report should be interpreted with adequate regard to this limitation.
# Table of contents

1. Background
   - Final versus Interim Report
   - The task
   - Methodology
   - Boundaries and limitations of the evaluation
     - Evaluating against the 2001 objectives
     - Other issues
     - The wider 2001 decision
     - Practical effect on findings

2. Summary of findings
   - Overview
   - Specific findings
     - Findings concerning the component reviews
     - Findings concerning content and other products
     - Findings concerning the effectiveness of the objects
     - Findings concerning governance and operations
     - Findings concerning developing the market
     - Findings concerning intellectual property
     - Findings concerning knowledge management and Joint Venture documentation
     - Findings concerning areas of improvement & additional work
     - Findings concerning issues at the boundary of the TLF’s role

3. Content and other products
   - Content
     - The content products of the TLF
     - Digital curriculum objects
     - Priorities
     - Digital assets
     - Overall assessment
   - Other products
     - Interoperability standards
     - Information exchange
     - Sustainability
     - Overseas sources
     - Teacher and student developed materials
     - Digital curriculum objects developed outside of the TLF
4. Governance and operations ................................................................. 19  
   Governance .................................................................................... 19  
   Operations ....................................................................................... 20  
      Learning from component reviews .................................................. 20  
      Operational performance .............................................................. 20  
   Knowledge management ................................................................... 21  

5. Developing the market ..................................................................... 24  
   Market Failure .................................................................................. 24  
   General Market Considerations ...................................................... 24  
   Summary .......................................................................................... 25  

6. Intellectual property .......................................................................... 26  
   The licencing regime ........................................................................ 26  
   Managing digital rights .................................................................... 26  
   Progress against the Phase 2 plan ..................................................... 27  

7. Issues at the boundary of the TLF’s role ........................................... 28  
   Learning management systems ....................................................... 28  
   Teacher preparedness ...................................................................... 28  
   The role of digital content in the developing national agenda in school education ......................................................... 29  

8. The Le@rning Federation in context ................................................. 31  
   Summary of The Le@rning Federation ............................................. 31  
   The continued relevance of the 2001 Ministerial objectives ............. 31  
   The evolving social and economic context ....................................... 32  
   Educational outcomes, teacher effectiveness and sectoral efficiency ... 32  
      A new pedagogy? ........................................................................... 32  
      Productivity and reform in the school education sector ................. 33  
   The ‘big picture’ lessons from the Initiative ..................................... 33  
      National cooperation and leadership ............................................. 33  
      National consistency and regional difference ............................... 33  
      Funding and investment ................................................................. 35  
      Managing the complete set of objectives ...................................... 35  
      Managing for all education systems ............................................. 35  

9. Appendix – Analysis of past reviews ................................................ 37  

10. Appendix – Summary of interview list ............................................ 45
11. Appendix – Thematic textual meta-tagging................................. 47
   The analysis of qualitative data using coding............................... 47
   Some results......................................................................... 48
   Approach.............................................................................. 48
   Indicative results................................................................... 49

12. Appendix – Infrastructure development................................. 50
1. Background

Final versus Interim Report
This Final Report retains much of the structure and text of the Interim Report. Where necessary, we have amended or supplemented the content to reflect our further enquiries since October 2005. This approach allows a new reader to see all that we have found without the need to refer to two documents. For those familiar with the Interim Report, it lessens the burden of distinguishing what is new from that which has merely been restated using alternative words.

The task
As set out in the Research Project Brief, the purpose of this evaluation is to check that the original objectives of The Le@rning Federation (TLF) have been reached, or will have been reached, by 30 June 2006.
These objectives are set out in the Phase Two Plan 2001-2006 and repeated in the Phase Two Plan 2004-2006.

3. Mission

3.1 Goal
The goal is for the Australian and New Zealand education systems to collaboratively develop and provide a continuing supply of high quality digital educational content in priority areas to enable students to gain maximum educational benefits from the online revolution.

3.2 Objectives
- Produce a pool of online material in areas of high priority, namely:
  - Innovation, Enterprise and Creativity: All year levels
  - Languages Other Than English: All year levels
  - Literacy: Years 5-9
  - Numeracy and Mathematics: Years P-6
  - Science: Years P-6 and years 9-10
  - Studies of Australia: All year levels
- Produce the online material within a framework for distributed access to state and territory gateways
- Develop online materials that:
  - represent the best education available or conceivable in the twenty-first century
  - will engage teachers and students in the construction of learning and in creative and critical thinking
- Support the growing innovations, enterprise and knowledge economy priorities of state, territory and Commonwealth governments in Australia
- Encourage a marketplace for high quality public and private online curriculum content

This goal and these objectives are the benchmark for the evaluation.
The Research Project Brief identifies that
"The purpose of the evaluation is to check from available documentation and evidence that the original objectives of the Initiative have been reached, or will have been reached, by 30 June 2006."

Two major objectives for the evaluation are established
"Objective One
To conduct a meta-evaluation of The Le@rning Federation in relation to its objectives as stated in the Phase Two Plan 2001-2006.
Objective Two
To report on findings and identify any areas where improvement could be made or focused within the wind-up period of the Initiative, or in any future Initiative."

Three additional objectives are also noted
The evaluation should identify:

- any areas where the joint venture documentation needs to be supplemented to ensure sustainability of the learning from this Initiative (that is evaluate whether major learning has been captured in a way that can be utilised or capitalised in the future); and

- any additional work that needs to be undertaken in the next 6 months to ensure the Initiative meets its objectives.

In the light of the objectives of the Initiative, the consultant should seek evidence that the joint venture learned from the component reviews conducted in 2001-2005.

The learning objects produced by The Le@rning Federation are only one element in an overall package of policy approved by Ministers that also included distribution, access and assembly for use in the classroom, and teacher preparedness. Our sense, even before commencing the evaluation, was that there would be as many issues raised that were beyond the boundary of the Federation’s responsibility and competence as fell within its mandate. These would need to be distinguished carefully in order to assess accurately the performance of the TLF as opposed to the overall package of policy agreed by Ministers in 2001. It was agreed that we would report on boundary issues as seen by stakeholders, as an extension of the formal terms of the evaluation.

Methodology

As indicated above, the 2001 goal and objectives are the benchmark for the evaluation. However, for stakeholders, it is their contemporary view of the TLF and its products that indicates whether or not it has succeeded. We have needed to integrate these two perspectives in order to fairly and appropriately evaluate the TLF.

A practical consequence of this has been that the stakeholder interviews proved to be much more valuable than the meta-analysis of past reports. Rather than just validating the meta-analysis, they became the primary source.

We asked stakeholders to look back over the totality of their experience with the Initiative, and comment on whether the quality of current practice and products adequately incorporates what has been learnt over the whole project.

In any event, our capacity to conduct a rigorous meta-analysis of past reports and evaluations was limited because

- consistent with the uncertainty about best practice that existed when the TLF was established, a common set of performance metrics or even descriptors of performance characteristics was not developed. In effect, most of the reports stand alone, and

- the evolving interpretation of the goal and objectives, and the external context against which they were being pursued, also influenced the reviews. Any trend information that could be derived from comparing reports over time was more readily available from stakeholders.

Chapter 9 Appendix – Analysis of past reviews summarises the past reviews we examined.

It was agreed that the contribution of individual stakeholders would not be identified. The appropriateness of this approach is always subject to debate. Anonymous contributions can give rise to uncertainty about whether our enquires among stakeholders have been sufficiently comprehensive and representative. While aware of these issues, the decision recognised the importance of gathering unencumbered feedback from people across a wide range of organisational levels and from organisations with important dependencies on others involved in the study. We are satisfied that our stakeholder interviews were sufficiently comprehensive and representative, and that, as far as practicable, we tested important information and opinions expressed by any one stakeholder with others on our interview list. Chapter 10 Appendix – Summary of interview list provides an overview.

Stakeholder interviews were conducted face to face, by telephone or through a written questionnaire. Each interview was based around a
common format and set of issues to improve our capacity to analyse the results. Thematic textual meta-tagging was used to increase the rigour of the analysis of the qualitative data gathered in the interviews. A summary of the results of this process is included in Chapter 11 Appendix – Thematic textual meta-tagging.

Objective two of the Research Project Brief asks us to "... identify any areas where improvement could be made or focused within the wind-up period of the Initiative, or in any future Initiative". Given the in-principle decision by Ministers to fund a further round of the Initiative, we have focussed on the second scenario. The issue is dealt with progressively throughout the Report.

Boundaries and limitations of the evaluation

Evaluating against the 2001 objectives

In the main, the 2001 objectives for the TLF are quite open-ended. They carry no concrete form in terms of quantity, technical quality, cost-effectiveness and so on. Thus, in a sense, the Initiative could not fail or, alternatively, prove it has succeeded. All depends on how qualitative terms such as 'support', 'encourage', 'develop a pool' are interpreted by different observers. As discussed above, this use of broadly stated objectives without any performance metrics carried over into the various reports and evaluations that have been conducted on the TLF.

However, this is not a criticism. When the 2001 objectives were agreed, the question of how best to realise the possibilities then seen in digital curriculum content was still uncertain. In its early stages, the TLF was more a research project than a production shop. Broadly stated objectives provided the necessary flexibility for an iterative development process. The fundamental question explored later in this report is whether the TLF remained on vision, true to the intent of the 2001 objectives.

Other issues

In the end, it is the perceptions of stakeholders today – the degree to which they accept and value the products of the TLF today – that are ultimately important. This means that the TLF is inevitably exposed to shifting and generally rising expectations over time. As indicated above, we dealt with this in the evaluation by asking stakeholders to look back over the totality of their experience of the TLF and its products.

Using stakeholders as the primary source also raises potential problems of selection bias and comprehensiveness. Of necessity the TLF provided us with the initial list of proposed interviewees. The broad-based membership of this list lessened our concerns around possible perceptions of bias. We have further broadened the list wherever we have sensed dissenting views or alternative perspectives, or where interviewees have suggested someone that we felt could offer a finer grained perspective or fill in an important area.

This report clearly points to the heavy weight of common opinion in the large number of stakeholders we interrogated. In short, our view is that the interviews have provided us with an accurate reflection of the range of views held by stakeholders.

A further potential element of uncertainty arises in an evaluation conducted before the conclusion of the project being examined. The greatest risk here is in undervaluing a project that necessarily has back-end loaded the delivery of products to stakeholders. In practice, however, this has not proved to be a significant issue. Stakeholders have been able to distinguish between the pool of digital curriculum objects and digital assets available today and what they anticipate will be available by the end of the current development cycle. Further they have been able to adequately distinguish trends in the quality and appropriateness of the products to ensure that their view is properly balanced across the life of the Initiative.

The wider 2001 decision

The 2001 decision by Ministers concerning the goal and objectives of the TLF was part of a broader policy position adopted at that time. While the implementation and effectiveness of these other elements of policy is outside the scope of this
assignment, it is not possible to report adequately on the performance of the TLF without giving some consideration to issues such as teacher preparedness and access and delivery systems.

In 2001, these matters were held closely by jurisdictions and systems and firmly placed outside of the mandate of the TLF. However, as discussed below, any analysis of the TLF must take account of the effect of these other elements of the overall package of policy on the TLF’s ability to meet its own goal and objectives. In addition, the majority of stakeholders are primarily concerned with the outcome of the complete package of policy, not with any one part in isolation.

It was agreed that we would include some discussion of these issues in the evaluation to the extent that they were at the boundary between the TLF and the other elements of policy, and as seen by stakeholders.
**Practical effect on findings**

While the limitations we have outlined are real, the weight of evidence falls so heavily to one conclusion that our view is that they are unlikely to have had any practical effect on the findings.
2. Summary of findings

Overview

By any measure, the TLF has been a success. In all substantial respects, it is on track to meet the goal and objectives set for it by Ministers in 2001.

Where we found calls for more, better or different – and there were some, across most aspects of the Initiative – we have noted such comments in the body of this report. The findings below represent the considerable weight of opinion among stakeholders.

The digital curriculum objects, digital assets, standards and other products the TLF develops are now generally highly valued. From an uncertain start, a commitment to continual improvement in specifying, commissioning, developing and testing digital curriculum resources has generated a considerable body of support among stakeholders for both the products of the organisation and the way it approaches its task. This is particularly evident among teachers involved with the development and use of the resources and, it appears, students.

The Initiative is widely considered to have generated resources at the desired level of quality at a much lower cost per jurisdiction than any one could have achieved alone. Moreover, the TLF is widely seen to have added substantial value beyond its core mission, including technical IT areas and digital rights management, copyright and licensing. Many stakeholders argue strongly that digital curriculum content is a powerful mechanism to support national consistency in core curriculum areas and improved teacher performance.

In terms of organisation, consultation processes and the like, there is widespread appreciation for the way TLF has approached its task.

Although complex, the governance arrangements are seen to have delivered a successful national initiative on an unprecedented scale, supported by effective funding arrangements, robust intellectual property agreements and extensive networks of expertise within school systems. International cooperation between Australia and New Zealand has been effective.

In relation to market development, the TLF has contributed a sound framework for an immature industry, through its technical standards, instructional design methodologies and quality assurance procedures.

While we expect the TLF to meet all its objectives, the necessary back end loading of its output of curriculum products for use in classrooms creates a challenging production management environment between now and the completion of this round of content development in June 2006. At the same time, the organisation must position itself for a further round of content development recently agreed in principle by Ministers and, perhaps, a progressive diversification in the way it secures this content. It is essential that the intellectual assets of the TLF not be threatened in this transition.

There is still more work to be done in involving teachers and jurisdictions in improving current and future objects and other resources. The push to June 2006 must not cause the many valuable suggestions and lessons from within classrooms and school systems to be lost. Stakeholders identified that, beyond 2006, digital curriculum resources need to be extended across more learning areas and year levels. Complementary resources such as the existing digital curriculum assets need to be further developed. Technical and pedagogical obsolescence will become a pressing issue more quickly than previously thought.

Nevertheless, in the TLF, Australian Governments have created an asset of substantial ongoing educational value. The incorporation of the TLF into the Curriculum Corporation and the in-principle agreement by Ministers to fund a further round of content development will help to ensure that this organisational and operational asset is maintained.

However, the work of the TLF cannot realise its full potential until other associated areas of policy and implementation reach a similar level of achievement. There are major barriers to adoption around deployment and access. Jurisdictions have found the creation of learning management systems much more difficult than was anticipated in 2001. In some systems, infrastructure constraints within schools remain a major ongoing problem. There is a growing realisation that teacher preparedness and use rests as much on
the actions expected of them as it does on new pedagogies or unaffordable levels of professional development.

These barriers and constraints need to be overcome or there will be a risk that the full benefits of the Initiative will not be realised. This is not seen as a reason to slow the development of digital curriculum resources but to accelerate action on the other elements needed for that content to be widely used in classrooms.

Many stakeholders see that the success of the TLF can be a catalyst for substantial reform elsewhere in the school education sector and, beyond that, an organisational model that decision-makers should consider in other areas.
Specific findings

Findings concerning the component reviews

1. The evidence is that the joint venture learned from the component reviews
   • there has been active follow up from review findings, and
   • the pivotal role of the teacher in take up of the objects was recognised very early in the life of the Initiative, but TLF has been constrained by its mandate in directly addressing most of the issues identified.

Findings concerning content and other products

2. After some difficulties with early digital curriculum objects, there is a widespread view that the TLF now produces digital curriculum objects of outstanding functional quality and pedagogical effectiveness
   • however, a few practical issues remain to be addressed.

3. There is a widespread demand for additional objects, especially to cover further learning objectives within existing subject areas, additional subject areas and all year levels.

4. A range of factors beyond priority subject areas and year levels may be useful in determining which objects to produce in the future.

5. The digital assets are widely valued.

6. The distinction between the various content products of the TLF will blur as intelligence such as instructional design is increasingly abstracted to the network.

7. The interoperability standards have been crucial to the success of the digital learning objects
   • consideration should be given to further harmonising them with international standards, and
   • interoperability standards around learning management systems is now an important issue as conflicting approaches may undermine the portability of content.

8. BELTS has been an essential and workable stop-gap measure but there is a need to clarify its future role.

9. The putative success of the Initiative to date brings forward the need to ensure sufficient on-going investment to deal with obsolescence among some learning objects, and to meet the challenge of broadening the availability of learning objects across more learning areas and all year levels
   • managing sustainability will be a critical issue for the next round of content development.

Findings concerning the effectiveness of the objects

10. Where the infrastructure and other environmental circumstances are favourable, uptake by teachers is strong; absent these circumstances, uptake is markedly weaker.
11. Students relate to learning objects with ease and enthusiasm.

12. There is some evidence that ATSI students relate particularly well to learning objects.


14. Evidence that the objects in themselves make a decisive difference to learning is limited at this stage (and is intrinsically difficult to obtain) but what is available supports the conclusion that they provide a general benefit, and

15. Some suggestions for improved functionality of the objects deserve to be followed up as to their feasibility.

Findings concerning governance and operations

16. The governance of the Initiative, both in its broad oversight and in the conduct of sensitive operational matters, has been exemplary.

17. The organisational and operational aspects of the Initiative have been generally highly successful, characterised by
   • a highly consultative approach, inclusive of jurisdictions’ needs
   • successful accomplishment of a wide variety of operational tasks
   • initiative in overcoming obstacles
   • enlisting wider expert support where needed, and
   • capitalising on the seniority of the Steering Group.

Findings concerning developing the market

18. Elements of market failure in an initially highly immature industry have been successfully addressed through the Initiative, in particular
   • establishing a framework for the efficient operation of the market in terms of relevant standards and methodologies, and
   • tendering arrangements, refined in the light of experience, that have enhanced opportunities for industry development and competitiveness.

19. The TLF may be able to use its internationally recognised product and expertise to leverage a range of digital curriculum resources significantly richer and more voluminous than can be obtained purely through locally procured product.

Findings concerning intellectual property

20. There is support for some simplification of the licensing regime but no desire for rapid or radical change.

21. The final step in completing the licensing regime (derivatives) now depends only on responses from a small number of jurisdictions.

22. The current policy of avoiding the use of active digital rights management technologies is important in maximising interoperability and keeping the administrative burden on schools to a minimum.
Findings concerning knowledge management and Joint Venture documentation

23. The TLF routinely documents key internal procedures and uses a comprehensive web site to make detailed information available to stakeholders.

24. Further work will be required by the TLF and jurisdictions to manage the risk of content assets being lost through format and platform obsolescence.

25. The TLF is an information and knowledge dense organisation, and it would benefit from a more complete approach to knowledge management, including more formally promoting knowledge intersection.

Findings concerning areas of improvement & additional work

26. The original objectives of the Initiative have largely been reached
   • it is reasonable to anticipate that expectations concerning the number of learning objects and digital assets will be met by June 2006, and
   • the TLF is actively pursuing the remaining issue in the licensing regime.

27. Areas of ‘improvement’ concern mainly the mandate of the TLF in a third phase
   • the governance arrangements have now been rationalised
   • there is a strong case to review the production objective, to enable a broader view of how quality learning objects are obtained
   • issues of cost effectiveness and user choice will benefit from review during a third phase, and
   • there is a strong desire among the most active users for direct access to the objects, and for an alert system as new objects become available

Findings concerning issues at the boundary of the TLF’s role

28. While beyond the responsibility of the TLF, certain issues need urgent consideration at the national level if the full value of the Initiative is to be realised, in particular the pivotal role of teachers, and the deployment systems through which teachers can obtain and marshal learning objects
   • teachers need clear messages about the expectation that they will rapidly adopt digital curriculum content in their classrooms, and
   • while the situation differs significantly between sectors and systems, there is a need to review the extent to which less than optimal learning management systems and related limitations are still constraining teachers’ access to, and ability to use, learning objects.

29. There would be benefit in further exploring the role digital content can play in the developing national agenda in school education, including learning outcomes in areas where national consistency and improved national performance are important, and in improving teacher effectiveness and productivity.
3. Content and other products

Content

The content products of the TLF

Many forms of digital content have educational value. Students and teachers access these materials through the Internet and from other sources.

The TLF produces digital curriculum objects and digital assets. Digital curriculum objects focus on a specific learning area and contain built in instructional design. They can be used by teachers as part of pre-determined learning sequences or incorporated in teacher-developed sequences. Teachers are able to integrate them with other teaching and learning approaches, or use them as stand alone resources.

Digital curriculum objects contain many elements such as text, sounds, animation, and calculation algorithms. Until recently, they have been deliberately designed not to be disaggregated by teachers for separate use in the classroom. In response to feedback from teachers and jurisdictions, and to the extent possible given the need to protect the rights of third party copyright holders, the TLF has started to include the component elements in the pool of digital assets.

We feel that this is a sensible move. No evidence was presented to us that it will reduce the propensity of teachers to use the objects as a whole. Indeed, our experience was that teachers are already using objects in subject areas, year groups and classroom circumstances well beyond those for which they were designed. Access to disaggregated elements is more likely to support further innovation by teachers than it is to undermine the purpose of digital curriculum objects.

Digital assets are resources that have typically been sourced from cultural institutions. They are a single item such as a piece of text, picture, sound or video sequence, accompanied by some information designed to assist teachers to discover and use them in their classrooms. Digital assets do not have build in instructional design. A disaggregated element from a digital curriculum object is likely to be a digital asset.

The distinction between these two classes of products is useful for most purposes in this Report. However, given the tendency of school education to significantly lag other sectors in transformative uses of digital technology, it is important to remember that, in those other industries, intelligence is being embedded throughout the production process. In the case of school education, we would expect that the intelligence in the network will increase as, for example, learning management systems mature and their use becomes standard practice for all teachers. The ability to abstract to the network at least some instructional design support for teachers is likely to blur the distinction between the content products of the TLF, but it will not diminish their importance.

Consistent with our comments elsewhere about the need for a systems approach to the overall policy package adopted by Ministers in 2001, we see this as an important contemporary issue although further comment is beyond the scope of this evaluation.

Digital curriculum objects

We sought feedback from stakeholders across all of the significant attributes of digital curriculum objects, including

- quality - e.g. production values, functionality, attention to detail


---

1 There is some ambiguity around the name of the second class of products. In some contexts they are referred to as ‘digital resources’ and, in others, as ‘digital assets’. We have continued with the term ‘digital assets’ for consistency with the Interim Report, and use the word resources with a more general meaning.
• consistency – e.g. within a learning area, between learning areas and between schooling years
• choice – e.g. whether teachers have a rich pool of objects to choose from in constructing a learning sequence appropriate to a particular class / learning area / year
• fitness for purpose – e.g. the appropriateness of the educational challenge to the target student audience, and
• supply – e.g. whether there are enough objects overall in each of the priority learning areas and years.

The view of the overwhelming majority of stakeholders is that the TLF now produces digital curriculum objects that are of high and often outstanding functional quality and pedagogical effectiveness. Concerns with some of the earliest objects such as the first science series have been addressed. In part this has been due to increasing knowledge of what constitutes an effective and well designed object, but stakeholders also point to progressive improvements in how the TLF goes about specifying objects, managing their development and testing them in the field.

In the main, any problems or concerns raised by stakeholders about the latest objects were related to
• points of functional (albeit important) detail such as the ability to save journals created by students, or to save the point reached by a student to allow objects to be more easily used across several sessions, or
• the relationship between objects and the learning management system used to deploy them (this is discussed further below).

A few stakeholders raised points of disagreement about the learning content or instructional design of specific objects or groups of objects but we gained the sense that these were more a reflection of the normal diversity of professional views than indicative of any fundamental flaw in the TLF’s approach.

Although objects are designed for specific learning areas, we found that many stakeholders use them much more widely across quite different subjects and year levels. This reusable characteristic is seen as a major benefit of the object based approach to digital curriculum content. Teachers particularly valued this flexibility. It should be taken into account in any future assessment of value for money.

Priorities

Reusability will also be a challenge in setting future priorities for the production of digital curriculum objects. Tying objects too tightly to very narrow learning areas may have the perverse effect of reducing the capacity of teachers to leverage off the investment by using them in other, unexpected areas.

We found a widespread demand for additional objects, especially to cover further learning objectives within existing subject areas, additional subject areas and more year levels. It was commonly pointed out that the more comprehensive the set of objects, the more quickly their use would become widespread as teachers could make them a standard feature of classroom learning activities.

In our view, it is not clear that a comprehensive pool of digital curriculum objects alone is sufficient to guarantee widespread use. We were disturbed by the uneven levels of awareness of digital curriculum objects among teachers, let alone actual use. We were surprised to find that this is not necessarily related to the length of time since a teacher completed their initial training. Several stakeholders were strongly critical of what they saw as a failure by many education faculties in universities to prepare new teachers for the use of digital curriculum materials in their classroom and in the use of IT generally.

One or two stakeholders raised a perennial question with digital technologies – what is needed first: deep, rich content; high quality access and delivery systems; or awareness among potential users. Of course, the answer is that they should emerge together, hence our emphasis on a systems approach. However, in the end, it is the availability of quality content that will maintain enthusiasm for digital learning materials among teachers. The experience so far is that teachers are able to cope with rudimentary discovery and access
arrangements or less than adequate learning management systems, albeit at some considerable cost in terms of their general propensity to use the resources, but there is no substitute for high quality content.

A number of stakeholders working in distance education identified additional benefits for their students and families. They were very positive about the results they had achieved in using objects. For example, they were seen to improve the engagement of students and support learning where the teaching parent had difficulty understanding the subject matter. As on-line delivery systems become more sophisticated for students able to attend a normal classroom, the challenge for the TLF and jurisdictions is not just to use digital curriculum content to meet the needs of distance education students but to harvest the innovation in the use of the resources that appears to be coming from that area.

There is considerable interest among some teachers in the utility of learning objects with specific categories of students. The extent to which the objects are particularly relevant to ATSII students, and low and high achievers, warrants further scrutiny. In this respect, the point has been made that high achievers will require more difficulty built into an object than tends often to be the case.

The question of the efficacy of digital curriculum resources with specific groups of students is part of a wider discussion of the purposes and priorities to which they should be directed in the future. We return to this theme later in the Report but it is useful here to record some of the specific purposes mentioned by stakeholders that are different from, or extensions of, the reasons more commonly quoted by jurisdictions and the TLF in official literature. These extended purposes included: increasing the time available for individual attention by reducing the supervisory and progress monitoring loads borne by the teacher for students generally in a class; allowing for remedial action to be automatically triggered; providing immediate support for teachers who lack experience or specialist skills and knowledge; improving the quality of teaching in some subject areas by providing timely guidance to teachers in instructional design; providing a more consistent framework for testing and reporting; and improving the ability of parents and others to extend learning beyond the classroom.

A number of stakeholders commented that at least some of the curriculum priorities adopted by Ministers in 2001 were no longer as relevant as they had been. The back end loading of development in the current round has highlighted this issue. As development and broader sourcing proceeds in subsequent rounds, the relevance of priority areas should be regularly reviewed rather than locked in for the whole funding period.

Stakeholders also emphasised the importance of adequate testing of objects in classrooms during the development process. The TLF has built this step into its object development procedures but some stakeholders felt that the extent of the testing should be expanded. Others believed that this would delay development and increase cost for little marginal benefit, suggesting instead that the resources should be put into a more rapid revision cycle to accommodate feedback once widespread deployment had taken place. This suggestion may prove relevant in managing the speed of technical and educational obsolescence in objects. Stakeholders also pointed out that field testing was a powerful mechanism to encourage adoption at the school and teacher level.

Whatever the merits of these various suggestions, they indicate that the field testing practices of the TLF have had a powerful and positive impact on many stakeholders, especially those close to the classroom.

In practice, the national perspectives now being developed will presumably drive priorities in the next round.

Several stakeholders proposed a more finely grained approach to prioritisation. They believed that factors beyond priority subject areas or year levels should be taken into account when deciding what to produce in the future. While our brief did not provide for an exhaustive exploration of this issue, several possible factors were identified including:

- the extent of the benefit in terms of learning outcomes provided by digital curriculum materials in one area compared to another. Our understanding is that the most recent research indicates a general benefit from the use of digital curriculum materials. It may now
be time to further examine that general benefit to see if some learning areas experience a particular advantage

- those elements in the curriculum that are particularly difficult to address through traditional teaching techniques
- learning areas where there is a shortage of teachers with specialist knowledge and skills, either generally, or in specific types of schools or locations
- learning areas where classroom practice and teacher effectiveness are sub-optimal, and not easily addressed by more traditional professional development techniques
- areas of importance to the national economy such as science and mathematics, where participation rates among students are falling or too low, and
- learning areas, locations or populations where student disengagement is a particular problem.

What is important here is not the merits of the specific factors listed above but that the question of priorities for the next round of development may benefit from such wider considerations.

**Digital assets**

Digital assets complement the pool of digital curriculum objects, providing resources of value to teachers and students across a broad range of areas.

There was strong support among stakeholders for this product and the manner in which the TLF had added value by packaging the asset with a set of information of use to teachers.

A number of stakeholders commented that the value was not just in the assets themselves. They pointed to the fact that the TLF had negotiated a set of breakthrough agreements with major cultural institutions. These agreements, including an approach to digital rights management that provided good flexibility for schools and teachers at a very low administrative overhead, were a template for subsequent negotiations, whether or not they involve the TLF.

**Overall assessment**

The clear weight of evidence from stakeholders and written sources indicates that the TLF is meeting the goal and objectives set for it in 2001 to develop high quality digital educational content in priority areas.

Many stakeholders are far more concerned about the impediments to their access and full exploitation of the resources. These issues are summarised in Chapter 7.

**Other products**

**Interoperability standards**

To accommodate differences in infrastructure and other systems in the various jurisdictions and sectors, the TLF has developed a set of interoperability standards. These are critical to managing risks associated with evolving operating systems and other software, bandwidth constraints and other infrastructure issues, and content management costs and similar budget allocation choices.

Most stakeholders strongly support a standards based approach rather than one built around a single platform. They see the TLF standards as having important applications outside of the immediate purpose for which they were developed.

However, standards themselves continue to evolve. A number of stakeholders pointed to ongoing changes at an international level. They argued that, while the TLF standards are compatible with and include many international standards, further work was required to accommodate important recent changes and to keep the standards relevant into the future. Compatibility with the dominant international standards is seen to be important as it allows jurisdictions and schools to more easily take advantage of digital curriculum materials developed overseas.
We found strong stakeholder support for the arrangements the TLF has established to involve specialists in resolving these technical issues. Indeed, as discussed elsewhere in this report, they are seen to add substantial value beyond the core activities of the TLF. Nevertheless, there is clearly some concern that the interoperability standards need to be kept in harmony with similar international standards.

While interoperability around content is a relatively settled area, it is now clear that the debate must be extended to include learning management systems and similar supporting infrastructure.

Some stakeholders believe that a single learning management system for all jurisdictions is required, at least across the public education systems. More commonly, stakeholders argued that, even if this ever was the case, the window for achieving it has now passed. Instead, they saw an urgent need for a nationally agreed set of interoperability standards for learning management systems.

There are several advantages in this approach: the different circumstances of the various education systems is recognised; the capacity for innovation is preserved; interoperability standards for content are not undermined by changes to the environment within which it must operate that are not cognisant of the effect of incompatible directions; and, most importantly in the medium term, the ability to abstract some of the support for teachers on instructional design and classroom practice from objects to the network, and to embed other intelligence at the same level, is not reduced.

Again, we see this as an important contemporary issue arising from the work of the TLF and jurisdictions.

**Information exchange**

In 2001, it was decided that deployment of digital curriculum content - discovery, access, assembly, use, access to associated materials, etc. by teachers and schools - was a matter for jurisdictions. The responsibility of the TLF finished at the gateway to each jurisdiction. In order to manage the deployment of resources to those gateways and for other purposes, the TLF developed an information exchange.

In practice, jurisdictions have found it much more difficult than was anticipated in 2001 to develop and implement learning management systems that, among other things, handle the deployment of TLF products to schools and classrooms. Stakeholders identified a number of reasons for this but, whatever the cause, adequate and comprehensive systems have only begun to emerge in recent years, and significant differences exist in the capabilities of jurisdictions and sectors.

The situation with deployment was further complicated as the non-government school sectors became fully engaged with the Initiative. In most cases, the intention was for the Catholic and Independent sectors to piggy back on jurisdictional networks and systems. However, this approach has had varying success and most non-government schools now access TLF materials using alternative arrangements. This has been a huge challenge for the Independent sector, one that they continue to struggle to overcome.

The delay in introducing systems at the jurisdictional level meant that teachers found it very difficult to gain access to TLF products. It was agreed that, as an interim measure, the TLF would implement a deployment platform (BELTS) that provided a basic set of tools for the discovery, access and use of digital curriculum objects.

BELTS was an essential and workable stop-gap. We received a very mixed assessment of the future role for the BELTS system. Some stakeholders argued that the need for BELTS had passed as jurisdictions implemented their own learning management systems, and that there should be a rapid transition out of that space by the TLF. In contrast, others were strongly of the view that BELTS still provided one of the best tool sets for the functions it covered and should be maintained and extended as a default system complementing but not competing with jurisdictional learning management systems. The third major view was that BELTS would be essential for the foreseeable future, as significant parts of the school education sector would not have a viable and affordable alternative available to them.
In developing BELTS, the TLF was forced outside the boundary of its mandate. It became at least partly responsible for a set of issues over which it did not have adequate control. There is no argument among stakeholders that this was a necessary and agreed step, but it highlights that a particular strength of the TLF model has been clarity around scope. Where this has been weakened, the strong consensus of opinion we have seen in other areas of the evaluation is also diminished.

For all of this, our assessment is that BELTS has been and remains a practical success. What is now required is the development of a consensus on how to move forward, especially resolving the differing views about the future need for the system.
Managing sustainability is a critical issue for the next round of content development. The documentation indicates that, when the 2001 goal and objectives were established, sustainability was primarily seen in terms of whether a market would emerge for digital educational content of the desired type and quality that would encourage private investment. As discussed elsewhere in this report, this has not proven to be the case.

Stakeholders now see sustainability in terms of several different issues:

- the certainty and adequacy of ongoing funding for what will clearly remain a publicly funded activity for the foreseeable future
- opening up alternative or additional sources of learning objects, including from overseas sources, suitable for use in Australian and New Zealand education systems
- the rate of educational obsolescence seen in digital curriculum objects, and
- the rate of technical obsolescence seen in digital curriculum objects.

The cost of maintaining the pool of objects as existing objects age and additional objects are added will become increasingly important. This is no different from obsolescence in other educational resources. No one expects that a textbook will remain relevant and appropriate indefinitely. The difference is that there is long experience in dealing with sustainability in other resource types – supply is mature and at critical mass, funding is entrenched and the relative value of different types of resources is well established, if not explicitly stated. This allows trade-offs to be made at every level – sectoral, schools and teachers.

None of this is yet the case with digital curriculum resources. It will be some time before this new resource type is fully embedded to the same degree as existing types.

Senior stakeholders were conscious of this issue and identified the need for it to be addressed. However, as yet there is no clear path forward. We were advised that the rate of educational and technical obsolescence was likely to be more rapid than might have been envisaged in 2001, although probably no greater than for other resources such as text books. The view is that some objects will need to be refreshed in the next round of content development although stakeholders did emphasise that updating digital curriculum objects was likely to be a more targeted and efficient process than for other resource types.

Overseas sources

The suitability and availability of digital curriculum resources from other countries (as opposed to general digital content of educational value sourced from the Internet) has been explored in a number of the component reviews and on other reports prepared for the TLF. To date, the clear conclusion from the written materials is that, while overseas resources have a valuable ancillary role, they are not a substitute for the products of the TLF. This view is strongly supported by many stakeholders. They identified the same issues as the written materials – match with local curriculum and year levels, cultural appropriateness and acceptability to students, unknown quality management process, etc. – but also highlighted difficulties associated with discovery, assembly and use resulting from a lack of meta-data, unknown levels of inter-operability and compatibility with deployment platforms, concern about the security of school networks and the lack of any reliable basis upon which to assess the usefulness of multiple assets other than the teacher reviewing the materials in detail themselves.

The written materials and stakeholder feedback strongly supports the need for the TLF to provide a core set of digital curriculum resources of known quality, functionality and effectiveness, which can then be supplemented by materials developed elsewhere at any level – sectoral, schools and teachers.

However, the critical question now being asked by the TLF and others is, in providing this core set of resources, whether the TLF should continue...
in a purely production role or should it have a broader mandate (often described to us as a brokerage function). In this model, the TLF would assemble resources from a variety of sources, including continuing an important production role. Material from all sources would be subject to the same priorities, and suitability, quality assurance and interoperability standards that now apply to development commissioned by the TLF.

The TLF argues that trials of the use of content in international classrooms have validated the emphasis that it has placed on educational soundness, pedagogical design and open technical standards. Further, they identify that international bodies have now produced content that is consistent with these standards and is suitable for use in Australian and New Zealand schools. Benefiting from this material will require a range of approaches in order for it to be available, affordable and more cost effective than indigenous development using the current model.

In a brokerage role, the TLF’s mandate would be to satisfy the identified priority needs for digital curriculum resources using a range of approaches such as commissioned development (as currently occurs), purchase of content developed elsewhere, exchange of content, and co-development with international partners. One reason for establishing the TLF was to avoid duplication of effort between jurisdictions to reduce cost, ensure a critical mass of technical expertise and promote consistency. Provided that standards are maintained, a more international scope could yield useful economies of scale and contribute strongly to sustainability.

**Teacher and student developed materials**

We have encountered a wide range of views over the possible direct involvement of teachers (or students) in the production of learning objects – from enthusiasm through scepticism to concern. Quantitatively, the output from even a fraction of professional, engaged teachers would be considerable. But there is scepticism that many teachers would have the time, motivation or technical expertise to work within the necessary quality constraints. The TLF has assessed the organisational costs as likely to be considerable.

But there should be some place in the advancement of on-line teaching and learning for quality assured teacher developed content, perhaps in particular learning sequences incorporating TLF product. With the Initiative moving to the production of digital assets in cooperation with cultural institutions, it could be useful to actively explore the idea, raised for example in Muirhead & Hauhgey, for a teacher exchange to share classroom materials developed by teachers using TLF learning objects.

It was also suggested by stakeholders that teachers are most likely to share resources such as learning sequences developed for their own use among smaller groups of colleagues. The best of these would rapidly spread across the profession if learning management systems and standard Internet tools supported overlapping professional networks.

**Digital curriculum objects developed outside of the TLF**

Several stakeholders directed us to examples of digital curriculum objects that had been developed outside of the TLF. These objects were targeted at valued learning areas that were not part of the priorities included in the Phase Two Plan. For example, the Catholic sector has developed a number of objects in the areas of values education and religious instruction.

The relevant point for this evaluation is that the design, development and testing of these objects has been heavily influenced by the standards created by the TLF. In other words, just as it has in interoperability standards, arrangements for accessing digital assets held by cultural institutions and a range of other important areas, the TLF is seen by stakeholders to have established the benchmark against which other investment and activity should be judged.

A number of stakeholders commented that this represents a clear expression of confidence in the work of the TLF.
4. Governance and operations

Governance

As would be expected with a high profile initiative in the public sector, governance issues have been addressed in considerable detail. A succession of general and specific governance reviews (all by Finlaysons) has been commissioned. It appears that the Steering Group or the Joint Venture has attended to all recommendations from these reviews promptly (refer to Chapter 9 Appendix - Analysis of past reviews).

Reflecting in part the complexity of the Initiative’s ownership and oversight, the initial focus was on the Joint Venture companies, and the AESOC CEOs in their various potentially conflicting capacities. The consistency of the Joint Venture Agreement with the governance arrangements of the Initiative was examined.

As the Initiative moved from start-up to implementation, examination moved to potential governance issues in the project management framework, the systems development plan, the IP property management plan and the learning exchange risk management plan.

The Steering Group also sought advice on sensitive operational matters (for example, changes to tender processes). As noted by the reviewer, it is imperative to maintain confidence in the integrity of processes among both stakeholders and other parties involved.

In summary, the general governance of the Initiative was found to be of a high standard.

In analysing the various governance reviews and considering the performance of the TLF in this regard, we found the comments made in the recent 2005 Governance Report to be particularly appropriate:

"The recommendations we made in our 2003 Governance Review have all been acted on to our satisfaction. The last major outstanding policy issue to be dealt with during the life of the Initiative is the Licensing Regime.

The Le@rning Federation is operating in accordance with the governance framework and … the objectives of the framework are being achieved.

… the major parties involved understand and perform their roles in accordance with the agreed roles, accountabilities and decision making hierarchy.

… there has been a continuing evolution in the governance practices of The Le@rning Federation. In the early years of the Initiative, the focus was on clarifying roles and accountabilities, creating decision making frameworks and establishing appropriate control and risk management environments. There was fairly detailed monitoring of the joint venture companies’ activities and considerable effort was put into systems for managing conflicts of interest and fulfilling probity requirements.

As the governance systems and practices have matured, … good governance has become embedded in the way The Le@rning Federation goes about its business. Routine governance activities have settled into a well established rhythm and there appears to be confidence in the robustness of the systems and the capability of the people administering them. This has allowed the Joint Venture to get on with fulfilling its role within a control framework where accountability is built into its systems and part of its culture. This in turn has freed up the Steering Group to focus on strategic and policy issues, while still monitoring the joint venture and holding the joint venture companies accountable through an effective reporting framework.

The governance model and practices employed by The Le@rning Federation appear to have served the Initiative well. Although
they may have felt cumbersome and as if the Initiative was over governed at times, they have provided a framework within which accountabilities have been clear and trust has grown.

The governance framework has underpinned a successful model for a federal collaboration using collective funding.

... while governance frameworks are very important, the ability, attitude and behaviour of the key people within the framework is a decisive factor in achieving good governance. Those people are to be congratulated for navigating The Le@rning Federation through a necessary focus on structure and process to a more evolved governance environment, where adherence to well established rigorous processes frees decisions makers up to focus on the big questions."

These comments are consistent with the position put to us by many stakeholders. They argued that, although the TLF governance arrangements and the Joint Venture structure appeared overly complex, it had been successful in practice. Several executive level stakeholders argued that the TLF and the Steering Group had remained responsive to the need to update the way in which the governance arrangements worked as the project progressed. This agility had meant that any administrative burden associated with the arrangements was managed within the TLF itself and was not visible to other stakeholders. This had increased confidence in the organisation.

The Initiative’s ownership and oversight arrangements have now been rationalised, with the TLF being folded into the Curriculum Corporation. With the maturing of the project, this seems an entirely sensible development. The latest governance review has identified the need to manage conflict of interest issues carefully.

Operations

Learning from component reviews

We were asked to test whether the "... the joint venture learned from the component reviews conducted in 2001-2005."

Our interviews with stakeholders and TLF staff indicate that the TLF has been responsive to external evaluation and input.

Some of the key points raised by the component reviews include

- other than in the some of earliest examples, few problems were found with the technical or design characteristics of the learning objects
- the initial reaction of teachers to learning objects ranged from caution over change, accentuated by limited capacity to deal with IT, to enthusiasm over the possibilities they offered
- from the beginning, the need for teachers to receive clear guidance that digital curriculum materials were to be integrated into standard classroom practice, encouragement and support by peers with adequate skills and resources, targeted professional development, and access to easy to use discovery and assembly tools has been accepted (issues mainly beyond the TLF mandate)
- new ideas continue to emerge about how best to use digital curriculum materials in relation to subject areas, classroom practice, student populations and other factors
- market linkages underwent evolution over the period, in light of experience and feedback from market respondents, and
- the TLF is a well run organisation.

Our discussion elsewhere in this Report shows that these and similar issues raised in the component reviews have been, and continue to be, important strategic and operational matters for the TLF.

Operational performance

The issues involved in mounting effective collaboration among the sovereign education jurisdictions are familiar, but always challenging.
and, for the TLF, were given new dimensions when New Zealand joined in the Initiative, and as the Catholic and Independent sectors became progressively more engaged at an operational level.

With the advantage of strong leadership at all levels - a point made to us repeatedly - the TLF seems to have been singularly successful in all operational aspects. Of note,

- at the strategic level, management capitalised on its direct access to the AESOC CEOs
- the TLF seems to have been entrepreneurial in the early identification of tasks, and in developing appropriate strategies
- the TLF successfully married quite disparate disciplines across the educational and technological domains
- effective, highly consultative forms of communication were established to relate to the many stakeholders in jurisdictions and beyond, which assisted in early response to perceived problems, and
- the TLF developed a productive, valued relationship with industry.

We did encounter some qualifications to this picture. In particular, unlike the Catholic sector which in the main has successfully capitalised on the opportunities offered by the Initiative, the disparate Independent sector, while no less enthusiastic about the potential benefits of the venture, has clearly struggled to keep pace with developments. Probably this is not the first occasion when this has been observed. It is primarily a matter for the sector itself to consider, in conjunction with respective Ministers, in the establishment of a project as ambitious as The Le@rning Federation.

We also encountered a range of comments from industry that indicate some difficulty in keeping abreast of developments relevant to themselves, and a strong desire by highly involved teachers to have a ready means of keeping abreast of latest developments, especially in available products.

Knowledge management

The Research Project Brief asks that we identify “…any areas where the joint venture documentation needs to be supplemented to ensure sustainability of the learning from this Initiative (that is evaluate whether major learning has been captured in a way that can be utilised or capitalised in the future)”. The management of documentation and learning in a sustainable manner, and how others might access and use that information, are elements of the broader issue of knowledge management. While it was beyond the scope of this assignment to assess the overall knowledge management practices of the TLF, it is worthwhile taking a slightly broader view than just documentation.

Knowledge management can be characterised in many ways but, for our evaluation, we have adopted a simple framework.

Knowledge management starts with the continuous capture of data, information and knowledge critical to the business functions of an organisation, including unstructured information, experience and skills, and heuristic processes and modes of decision making.

The TLF undertakes extensive documentation of its processes and decisions although some care is required to avoid mixing the purely descriptive with information that is important in business processes. Further, continuous capture and the inclusion of unstructured forms requires approaches that go beyond a purely document based paradigm.

It seeks to ensure the right knowledge is available to staff and others outside the business at the right time.

The TLF uses procedure manuals and other formal guides to make knowledge available to the appropriate personnel when it is required, and maintains an extensive web site containing detailed information and knowledge relevant to people in jurisdictions and systems. Stakeholder feedback, especially from technical IT personnel, indicated a high degree of satisfaction with the resources the TLF makes available online. This reflects an important strategic
decision by TLF management relatively early in the Initiative to ensure that key information assets were available to stakeholders in an accessible form. 

Knowledge management deals explicitly with sustainability and archival issues, including maintaining information in a form that is accessible to contemporary platforms.

Web based storage and common but mainly proprietary content formats have provided the TLF with a short term solution but decisions will be required about how to sustain access to textual, graphical, video and audio resources as legacy formats are no longer supported.

The TLF has been influential in the emergence of consensus approaches to IP and licencing, interoperability standards and in similar areas in part because it has had a direct interest in their resolution. The TLF has large and valuable content holdings. As with all such organisations, its assets are at risk from format and platform obsolescence. It may be that the TLF can play an influential role around standards for preserving access to content.
Knowledge management creates intersections between otherwise separate areas.
Knowledge intersections are rich sources of innovation. Some of the forums maintained by the TLF play a knowledge intersection role but we saw no indication that this is a formal part of the organisation’s internal business processes. The TLF is an information and knowledge dense organisation, and it would benefit from some consideration of this area.

Knowledge management reduces dependencies on individuals and small groups.
Critical business information, knowledge and processes can become closely held by an individual or small group making an organisation such as the TLF dependent on their continued presence and cooperation. While experienced personnel are valuable assets, an investment such as this initiative should treat these knowledge assets in the same way as it does physical assets – critical property to be managed and maintained in the interests of the business and independent of any one individual.
5. Developing the market

One of the specific objectives for the Initiative is to "encourage a marketplace for high quality public and private online curriculum content".

Market Failure

Prior to the formation of the TLF the digital curriculum content industry was extremely immature. The Trinitas Report identified the need for two strategic interventions to overcome market failure, and provide a basis for the development of the industry, viz

- establishment of a framework for the market, and
- public funding to kick start on-line curriculum development.

With one important exception, the market framework was successfully put in place during Phase One of the Initiative. Key aspects include

- setting technical standards
- setting instructional design standards and methodologies
- specifying developmental and quality assurance procedures, and
- establishing a systems environment.

As noted in the November 2003 Review of Market Linkages, by the end of Phase One the TLF had already become recognised as a global leader in developing standards and frameworks.

The exception concerns resolution of the complex issues involved in the management of intellectual property rights. As elaborated in Chapter 6, a widely accepted licencing regime has now been established.

The processes by which TLF presented its significant allocation of public money to this very immature industry posed a number of challenges (beyond those, discussed elsewhere in this evaluation, involved in the aggregation of demand-side needs of its component jurisdictions).

The initial approach to tendering for content reflected a felt need by the TLF to be dealing with demonstrable fairness between all industry elements, in the public as well as private sectors, and between regions. This resulted in a number of problems, such as loss of economies of scale and excessive overheads.

In response, in consultation with all the parties, the TLF removed regional distinctions, took curriculum development in-house and consolidated tenders around ‘best in breed’ suppliers. Allowing for some inevitable and, indeed, desirable on-going tension between purchaser and supplier, these reforms have been generally accepted, and welcomed, by the market.

For example, the Phase Two Review of Market Linkages noted that production, project management, quality assurance and testing processes had significantly improved, with the achievement of much more workflow planning and collaboration.

General Market Considerations

The question of whether the Australian on-line curriculum content industry has achieved sufficient critical mass to be globally competitive is beyond the purposes of both the TLF and this evaluation. The industry is always likely to be small, by any standard. However, as acknowledged by the industry, the Initiative has significantly assisted elements of the wider digital content industry in becoming more globally competitive through driving improved productivity and skills within a standards framework acknowledged to be head of class, and, as noted, in concentrating activities around ‘best in breed’ suppliers.

There is evidence - from Austrade and others - that some learning objects can be sold overseas, at least to particular markets such as Singapore, or capitalised on in other ways with indirect financial benefit.

However, the notion that TLF content is marketable in a volume relevant to significant cost recovery has increasingly come to be understood to
have been a misapprehension. TLF content is specifically designed for the application of non-commercial school education in Australia and New Zealand. Its potential for use in other applications for which it has not been specifically designed is quite limited.

There may be opportunities to market TLF IP and related assets rather than content alone. It may well be productive to explore the extent to which TLF content, non-content IP and the services available as a result of the TLF Initiative could strengthen educational service offerings in overseas markets. However, to a significant extent, events have now moved on in several respects:

• there is keen interest among some multimedia interests in obtaining the property rights of ‘derivatives’ of the learning objects (as mentioned in the preceding chapter) although it has to be said that the size of this development is unlikely to be large, and

• of more potential significance, the debate about a broader mandate for the TLF, assembling resources from a variety of sources, including international bodies, in addition to its existing production role (see the section headed Sustainability in Chapter 3).

Summary

We are inclined to draw these conclusions from the foregoing:

• the important issue of cost recovery can now be seen in a broader perspective. The TLF may be able to use its internationally recognised product and expertise to leverage a range of digital curriculum resources significantly richer and more voluminous than can be obtained purely through directly procured product

• while this may be seen as taking demand away from the local market, it will expose the quality of such product internationally

• given the extent of market development now achieved, educational objectives in the third round are surely those that should prevail, and

• in this approach, the TLF is given the responsibility to supply the required products but the flexibility to source those products in the most efficient fashion.
6. Intellectual property

The licencing regime

The products of the TLF are covered by a series of licences (Licences A to H with a possible Licence I). These licences are designed to allow for a wide range of educational uses while protecting the intellectual property of the Joint Venture and third parties, set out certain rights and obligations, help show how digital rights are to be managed, clarify the arrangements under which certain parties can commercialise derivatives of TLF content, and for other purposes.

Negotiating these licences has been a drawn out and, at times, difficult process. In part this reflects the fact that the licences represent the first major attempt by the school education sector to deal with intellectual property rights in a comprehensive manner.

Nothing in the 2001 goal and objectives for the TLF requires a particular approach to intellectual property. However, in the early years of the Initiative, jurisdictions were concerned to protect what some saw as a substantial opportunity to commercialise TLF content. A ‘closed’ approach with a range of specific licences and detailed provisions on the rights and obligations they conferred was seen as a worthwhile precaution.

It is now understood by most stakeholders and documented in several reports that there are few commercialisation opportunities around TLF content. However, by the time this became understood, the licencing regime was substantially in place.

There is a widespread view among stakeholders that the existing licencing regime is overly complex. A more ‘open’ approach is now considered to be superior although it is accepted that there are third party rights associated with many digital curriculum objects and digital assets that must be protected.

Nevertheless we found little demand among stakeholders to change the licencing regime in the immediate term. The current agreements represent a large investment by all of the parties, in most cases have the advantage of being in place and operating, and have become familiar to decision makers. In practice, they have not proven to be a substantial barrier to sensible deployment, use and other exploitation of the content.

Our sense is that there is support for reform of the licencing regime but no immediate need for radical change. In particular, stakeholders see some simplification of the current arrangements as practical and desirable.

Stakeholders were generally supportive of the process used by the TLF to negotiate the licences. It was seen to be inclusive and to provide sufficient time for the parties to become comfortable with new concepts. As with other aspects of the TLF process, the Independent sector has sometimes found the issue to be complex and expensive to manage because of the autonomous nature of its constituent schools.

Intellectual property rights and the licencing regime will be an issue for the next round of content development, but one that can be approached in a measured manner building on existing consultative practices.

Managing digital rights

There are different ways in which digital rights can be managed and enforced. In many established industry sectors, ‘wrapping’ content in active digital rights management capacity is seen as the best way to ensure compliance and protect valuable assets. In other circumstances, end users and intermediaries are provided with guidance about appropriate behaviour and, sometimes, incentives to respect the rights of the content owner.

The TLF has adopted the latter course in protecting the intellectual property of the Joint Venture and third parties. Not only is this seen as more consistent with the culture of the school education sector, it is an important part of maintaining interoperability in TLF content. The approach also dramatically reduces the administrative and systems management burden placed on schools and teachers.
The current approach to managing digital rights is widely supported by stakeholders. This is especially the case among those responsible for managing technical systems.

Again, while the 2001 goal and objectives do not require a particular approach to this issue, the path adopted by the TLF and supported by stakeholders is the most consistent with the aims of maximising benefits from and engagement with digital content.

Progress against the Phase 2 plan
While the 2001 goal and objectives do not establish a timetable for the licencing regime, one is adopted in the Phase Two Plan 2004-2006.

One licence included in the timetable remains unresolved, the so called LICENCE B - Government systems & private school bodies - Commercialisation of Derivatives. At the time of completion of this report, we believe TLF has taken every appropriate initiative, and steps are now needed to expedite the completion of this licence by certain jurisdictions.
7. Issues at the boundary of the TLF’s role

As noted earlier, it was agreed that we should report on issues emerging at the boundary of the TLF’s responsibilities. The ambit of the TLF’s mandate was tightly drawn. In retrospect, it can be seen that this has left the full realisation of the project’s potential, however outstanding its product may be, hostage to factors outside the control of the Joint Venture.

By the end of Phase II, there will be a large pool of high quality learning objects and a highly receptive school population, but a continuing, if slowly lessening, array of impediments between the two.

Learning management systems

It may seem surprising, in the abstract, that the logic of the huge economies of scale inherent in joint production of learning objects was not extended to jointly shared means of distribution, discovery and access. The reasons for this are well beyond the scope of this evaluation.

In any event, some though not all jurisdictions have now moved decisively to make the necessary investments to develop their own systems geared specifically to their own circumstances, taking advantage of free open source solutions such as Moodle or proprietary solutions such as Myinternet. This leaves some less well resourced jurisdictions, and some in the Independent sector, still dependent on CD-ROMs to obtain TLF content.

The TLF surveys and tabulates the current state of infrastructure development among jurisdictions. This is a very comprehensive and useful process, especially for senior executives in jurisdictions looking to benchmark their own performance in this area against other systems. By way of example, Chapter 12 Appendix – Infrastructure development shows the first page of the most recent survey.

Given the very significant investment in the production of high quality learning objects, it seems very desirable for AESOC to review the extent to which less than optimal management systems (and indeed other factors further along the chain) are still constraining the utilisation of this product in the various jurisdictions.

Teacher preparedness

As the jurisdictions eventually get effective learning management systems into place, the pivotal role of the teacher in capitalising on digital curriculum materials becomes even clearer than it was at the outset.

It is beyond our responsibility to pursue this, other than to point out that a variety of initiatives, some costing little, have been put forward in the various reviews we have examined as well as by a number of stakeholders we have interviewed. A non-exhaustive list would include

- on-line communities of practice amongst teachers to engage with peers about the appropriate use of learning objects, which could be supported by TLF expertise where relevant
- professional development of teachers in selecting, structuring, implementing and monitoring the use of learning objects
- provision of leadership in mandating change, particularly at the level of the Principal but also by jurisdictions and sectors. Some held that this was more effective than any amount of professional development or new pedagogies
- provision of a qualified IT resource in all schools (some jurisdictions are in course of implementing versions of this)
• development by TLF of an alert system for nominated points within (or readily accessible to) all schools to provide early advice of new developments, especially the availability of new objects
• review of cataloguing and access systems for teacher librarians
• making learning objects free to all, rather than the property of jurisdictions (or the producers), and
• upgrading training at the tertiary level to properly deal with IT generally and the use of digital materials in classrooms, and targeted ‘remedial’ assistance to the large body of teachers who entered the profession long before the relevance of the computer was imagined.

It is clearly not for this report to advocate any particular proposal. But, if only because of the considerable investment of time and money into this joint Initiative, these notions deserve collective as well as individual consideration by jurisdictions.

The role of digital content in the developing national agenda in school education

A further issue at the boundary of the TLF is the role of digital curriculum content in the national agenda around school education.

There has been a growing focus on the benefits of national consistency in core areas of curriculum such as mathematics and science, and how this might best be achieved. This is part of a wider debate about ways to improve educational outcomes, including the best models for student learning, the role of monitoring and reporting, and enhancing teacher effectiveness and classroom practice.

These matters are critical to our national economic performance, the maintenance of our civil society and inclusive social compact, and in expanding opportunities for individual fulfilment.

It is well outside the scope of this report to examine the issues involved in this debate or to test the merits of various approaches. However, the evaluation did reveal a strongly held view among some senior stakeholders that the widespread use of digital curriculum content, developed using the TLF model, in Australian classrooms would be a powerful tool in achieving these objectives. As mentioned elsewhere in this report, these stakeholders specifically advocated the deliberate use of the Initiative for this purpose.

The feedback from stakeholders is relevant to Objective two of this evaluation as it relates to the focus of any future initiative. However, this is clearly a substantial policy issue and it is not the role of this report to undertake any necessary analysis. Instead, we have synthesised and summarised the position put by stakeholders as follows

• well designed digital curriculum content used effectively across a broad range of learning activities within classrooms has a positive effect on student engagement and learning outcomes
• digital curriculum content is well suited to the areas of interest for national consistency
• while remaining inclusive, the approach used by the TLF to specify, develop and test digital curriculum content heavily emphasises best practice both in what is learnt and the manner in which the learning takes place
• digital curriculum content can be expanded and deployed relatively quickly, and can be readily revised in light of new evidence
• digital curriculum content and the learning management systems used to deploy it
  - can provide significant guidance to teachers without reducing their necessary flexibility in responding to the unique combination of needs seen in their classroom
  - significantly enhance a teacher’s capacity to monitor and report on the progress of individual students
- further improve teacher effectiveness and productivity by increasing their flexibility in allocating time to individual students and providing a greater capacity to manage many simultaneous learning sequences among students, and

- adoption by teachers will be significantly accelerated if educational authorities clearly identify the use of digital curriculum content as an expected part of normal teaching practice.
Summary of The Learning Federation

It is useful to briefly reflect on how the digital curriculum content Initiative developed in Australia.

The first question was whether a case for action could be established. Jurisdictions agreed that there were sufficiently compelling pedagogical, economic and social policy reasons for the rapid adoption of digital curriculum resources in Australian classrooms.

The second question was whether the market would provide the necessary digital curriculum materials, learning sequences and infrastructure. It was agreed that, without intervention, the response would be ‘too little, too slow’. Market failure was anticipated among providers and users.

To address this market failure, significant resources were committed and an initiative, The Learning Federation, created. The mission of the TLF was to ensure the development of a set of digital curriculum objects, including setting standards, providing the necessary infrastructure and acting as a market organiser. The objectives were to achieve a critical mass of digital curriculum materials of known functional quality and pedagogical effectiveness, and encourage the emergence of a sustainable provider market.

In meeting these objectives, it was hoped that private sector investment would be attracted to the production of digital curriculum materials.

The continued relevance of the 2001 Ministerial objectives

In 2001, Ministers set a course for the development and use of digital curriculum content in Australian schools. While their decision was the result of extensive consideration and analysis, it was inevitably based on imperfect information. The role of digital curriculum content in teaching and learning was still speculative, although the importance of acting in advance of certainty in this area has been stressed repeatedly.

For Ministers, there was every indication that the use of digital curriculum content would bring important, even transformational changes to learning outcomes, student engagement, teacher effectiveness and classroom practice, but how best to achieve these possibilities was still unclear.

Sensibly, this uncertainty was reflected in the open-ended nature of the objectives set for the TLF. As mentioned in Chapter 1, while the terminology was qualitative and there were few concrete objectives against which progress could be measured, the approach provided the necessary flexibility for an iterative development process that has proven to be highly effective. There is no indication that the TLF has lost sight of the broad objectives sought by Ministers as the Initiative has progressed. Instead, they have clearly remained the central vision against which the strategy and actions of the TLF have been tested.

Looking forward to the next stage of digital curriculum content development, it will be necessary to consider whether there is now sufficient knowledge to set more concrete objectives. From a purely instrumental view, good practice in commissioning and developing content is now well established. There is no reason that production metrics and other measures of efficiency cannot be developed.

See, for example,
The Power Of The Internet For Learning: Moving From Promise To Practice, Report Of The Web-Based Education Commission, Washington D.C. December 2000 (Available at: http://www.ed.gov/offices/AC/WBEC/FinalReport/index.html), and
Fulfilling the Potential: Transforming teaching and learning through ICT in schools, Department for Education and Skills, 2003 (Available at: http://www.dfes.gov.uk/ictinschools/).
In contrast, our understanding of the nature of digital curriculum content, and how best to use it to enhance learning outcomes and improve teacher performance, is still emerging. The technology remains fluid and immature. There is still substantial innovation required to discover all of the ways in which this new resource can be successfully exploited. The need for more research around these issues was repeatedly put to us during the review. However, there was also a well-articulated argument that widespread deployment and use should not be delayed until these matters are settled. Indeed, it is this extensive contact with the reality of students, teachers and classrooms that will supply that guidance.

Further, as discussed elsewhere in this report, the existing agenda for digital curriculum content is incomplete, requiring more objects across further subject areas and year levels.

To a large measure, therefore, the 2001 Ministerial objectives remain relevant to the next stage of digital curriculum content development. While there are opportunities for more concrete metrics, the need for flexibility to accommodate new lessons about how best to define, develop and deploy the resources remains unchanged.

The evolving social and economic context

It is outside of the scope of this report to detail the impact of digital technology on our society and economy, or the importance of education to national performance relative to competing economies, the maintenance of a civil society and opportunities for individual fulfilment.

It is sufficient to say that digital technology is a major means by which increased knowledge is embedded in goods and services, a significant determinant of value in a modern economy. This increasing penetration of digital technology is not just an economic phenomenon. Our relationship with the technology is changing as it shapes the characteristics of our society, and as legacy alternatives become increasingly unavailable.

In other words, the technology is becoming ubiquitous - essential, widespread and non-replaceable - but this is happening through a series of discontinuous shifts rather than a smooth process of continuous change.

Against this background, many of the stakeholders consulted in developing this report contrasted the experience of most students in their classrooms with their life outside of school. Outside of school, digital technology and the information and network spaces it supports penetrate all aspects of most young peoples' lives. School aged children in Australia have passed the discontinuous shift and experience technological ubiquity as normal. Yet, when they enter their classrooms, there is no ubiquitous penetration of the technology and its associated information space, and what are clearly legacy alternatives outside of school continue to predominate.

Stakeholders stressed the negative impact of this divide on student engagement with learning, perceptions about the relevance of school and classroom, and the relationship between teachers and their students. They argued that digital curriculum content provided one of the most important pathways to reversing this growing fracture because, unlike technology deployment alone, it could be used as a normal part of all aspects of a student’s classroom and learning experience.

Educational outcomes, teacher effectiveness and sectoral efficiency

A new pedagogy?

The consultations revealed a difference of view about the need for a new pedagogy to best exploit digital curriculum content. Commenting from a central curriculum perspective, some stakeholders questioned the capacity of teachers to properly exploit the resources without extensive guidance and the emergence of a new pedagogy.

Most others, including the classroom teachers we consulted, took a more pragmatic view. They argued that, while a new pedagogy might emerge from the use of digital curriculum content, teachers are quite capable of incorporating it into their existing pedagogical approach. The strong
view was that students would benefit greatly from widespread deployment and use within existing patterns of teacher and classroom practice.

**Productivity and reform in the school education sector**

A number of stakeholders also put the view that the widespread introduction of digital curriculum content was an essential component of productivity improvement and other reform in the school education sector. They pointed to the contribution that significant penetration of the technology has made to productivity in other sectors of the economy and to overall national performance, and contrasted this with the school education sector.

An important and often repeated point was the opportunity that digital curriculum content offers to change the nature and organisation of work by teachers. Increased flexibility in allocating time, improved capacity to monitor the performance of students and a greater capacity to manage many simultaneous learning sequences among students were given as examples of the benefits that could accrue to teacher performance and productivity.

**The ‘big picture’ lessons from the Initiative**

A number of the stakeholders operating at an executive and strategic level, and in some technical specialties, strongly emphasised that the value of the TLF went well beyond its core mission. They saw it as both a catalyst for other valued outcomes since 2001 and into the future, and an exemplar for national cooperation in the schools sector. The Initiative was frequently described in terms such as “by far the most successful example of national cooperation to date” and “a model for how we should go about things”.

At the same time, these stakeholders believed that the Initiative had thrown up some valuable lessons about what not to do when approaching a project of this scale and importance.

While many individual points were made along these lines, five areas were commonly identified as big picture lessons about what to do and what not to do.

**National cooperation and leadership**

“Many things could have been achieved without The Le@rning Federation but they weren’t happening. I simply don’t believe we would have come together and agreed on such a broad range of issues if the Federation hadn’t existed.” (A senior jurisdictional technical specialist)

It is clear that the TLF acted as a catalyst for change in a number of areas that touched on its core mission but were outside its direct responsibility. This is not to say that TLF resources were directed to these purposes but that the Initiative provided

- structures - within which motivated people could take responsibility, reach decisions and act
- reasons for action - providing a trigger or opportunity to solve wider questions where the imperative to act had previously been insufficient, and
- communications channels - formal and informal networks supported by good communications tools and practices implemented for TLF purposes but that could be leveraged off for wider school education reform.

While there are other structures within the sector that achieve similar purposes, there was a strong view that the TLF had been particularly successful as a platform for wider action.

**National consistency and regional difference**

There was also a widespread view among stakeholders at these senior levels that the TLF model achieved the right balance between national consistency and regional differences, and between a rigorous and efficient process and the opportunity for innovation.

As discussed briefly in Chapter 2, digital curriculum content is increasingly seen as a powerful mechanism to achieve improved
• national consistency in core areas such as mathematics, science and English, and
• teacher effectiveness on a large scale at low unit cost.

At the same time, the object based approach adopted for the Initiative was seen to allow considerable scope for innovation both in content and application. Many stakeholders argued that curriculum must accommodate different regional, cultural, religious and social contexts. By creating a body of knowledge about best practice in the development of digital curriculum content, the TLF had improved the capacity of systems to deliver this diversity. A number of stakeholders argued that digital curriculum content should be purposefully and systematically used to advance the national schools agenda, building on the success of the TLF as a cooperative mechanism.
Funding and investment

Stakeholders identified that the approach to funding agreed in 2001 was an essential element in the TLF’s success. They made the following points:

- enough money was allocated – the level of investment was sufficient to provide a critical mass of activity
- there was certainty of funding – this supported the necessary research and learning process, a long term approach to when the money could best be spent (for example, the back-ending of products that has occurred), and the development of an organisation with substantial intellectual assets, and
- it was efficient to act together – while some might argue that the cost per object was high (although this is by no means widely accepted and does not take account of costs avoided elsewhere in school systems), the cost per object per system at the desired level of quality was well below what any of the jurisdictions could have achieved acting alone.

At a senior level, this approach to funding was widely seen as a model for other national initiatives.

Managing the complete set of objectives

In 2001, Ministers agreed to a package of policy around the production and use of digital curriculum content, not just to the goal and objectives for the TLF. While it can be variously categorised, three policy pillars stand out:

- the specification and development of digital curriculum content (objects and assets) to be managed by the TLF
- deployment of the content; discovery, access and assembly of individual elements by teachers in classrooms; and use by students to be managed by jurisdictions, and
- developing teacher preparedness to be managed by jurisdictions.

Most stakeholders commented that these three pillars had not proceeded sufficiently in parallel. The problems that have arisen because of this are discussed elsewhere in this report.

A number of executive level stakeholders argued that, no matter how compelling the arguments were in 2001 for a strict separation between the responsibilities of the TLF and those of jurisdictions, there had been a failure to explicitly monitor and, as required, manage at a national level the complete set of policy objectives. Extensive governance and consultative arrangements were implemented for the TLF but there was no similar commitment for the other pillars. Several stakeholders also put the view that this lack of explicit arrangements

- came at the cost of lost opportunities for cooperative action between some, if not all jurisdictions
- caused some systems to lag behind others more than might otherwise have been the case, and
- could have been avoided with no imposition on jurisdictional sovereignty.

In terms of the 2001 package of policy, the failure to take a systems approach (used here in its technical meaning, not to refer to school systems) is seen by at least some stakeholders to have delayed the widespread adoption of digital curriculum content in Australian classrooms.

Stakeholders identified that future initiatives should adopt a systems approach at the national level where there are similar significant dependencies between areas of policy and implementation. At a minimum, this should extend to systematic and explicit monitoring.

Managing for all education systems

The final big picture lesson identified by a number of senior stakeholders was the need to manage policy in areas such as digital curriculum content for all school children, regardless of the system through which they receive their education.
While the Initiative always included the Catholic and Independent sectors, it was some time before they were fully operationally involved. Even now, they are not part of some of the key decision making bodies although we note that the agreed arrangements for the next round of content development provides these sectors with improved participation in decision making.

Although satisfactory arrangements apply in some jurisdictions and for some parts of these other sectors, there are clear disparities, at least some of which might have been avoided if a wider perspective had been adopted from the beginning.

The particular issues around the Independent sector and possibly some elements of the Catholic sector are mentioned elsewhere in the report. Most are outside the remit of the TLF but as boundary issues, they represent significant barriers to the adoption and use of digital curriculum content. At least some of these could have been mitigated with a different approach.
9. Appendix – Analysis of past reviews

The table on the following pages summarises the scope and major results or recommendations of the component reviews and other written materials we examined.
<table>
<thead>
<tr>
<th>Title (short form)</th>
<th>Date</th>
<th>Author</th>
<th>Summary Scope of Review</th>
<th>Summary Results/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Objects</strong></td>
<td></td>
<td></td>
<td><strong>Assessment of the Learning Objects, Models and Frameworks</strong></td>
<td><strong>Learning objects developed successful in terms of accuracy, size, aggregation, flexibility, localisation, &amp; customisation.</strong></td>
</tr>
<tr>
<td><strong>Muirhead &amp; Haughey</strong></td>
<td>Sep</td>
<td>Muirhead &amp;</td>
<td>Assess usability, exchangeability &amp; re-usability of twenty two learning objects.</td>
<td><strong>TLF mandate should expand to allow teacher communities of practice.</strong></td>
</tr>
<tr>
<td><strong>Haughey</strong></td>
<td>2003</td>
<td>Haughey</td>
<td>Development, instructional design &amp; pedagogical use of learning objects within international setting.</td>
<td><strong>Content development should expand to include online curricular materials.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Various recommendations concerning international linkages.</strong></td>
<td><strong>All feedback within its mandate has been incorporated.</strong></td>
</tr>
<tr>
<td><strong>Assessment of the Learning Objects, Models &amp; Frameworks Phase Two</strong></td>
<td>Jan</td>
<td>Muirhead &amp;</td>
<td>Has TLF taken account of feedback in Phase One review?</td>
<td><strong>International leadership remains intact.</strong></td>
</tr>
<tr>
<td><strong>Haughey</strong></td>
<td>2005</td>
<td>Haughey</td>
<td>Has TLF retained international leadership?</td>
<td>‘Focus’ on instructional design remains essential.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Validity of 100% quality in instructional design?</td>
<td>Several recommendations at or beyond boundary of TLF mandate for teacher support &amp; links to online curricular materials.</td>
</tr>
<tr>
<td><strong>Learning Exchange</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Partner international projects to add to available quality.</strong></td>
</tr>
<tr>
<td><strong>2003</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>No technical impediments identified; no implementation flaws.</strong></td>
</tr>
<tr>
<td>Title (short form)</td>
<td>Date</td>
<td>Author</td>
<td>Summary Scope of Review</td>
<td>Summary Results/Recommendations</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>-----------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>II. MARKET LINKAGES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Review of TLF Phase One Market Linkages | Nov 2003   | Convergent Consulting | Assess market linkages developed by TLF.                                                  | Phase One objectives (establish market framework: kick-start curriculum development) met or exceeded.  
Supplier concerns  
• variety of issues identified limiting efficiency & effectiveness of contracting model, and  
• jurisdictions need to resolve IPR ownership if export opportunities to be maximised. |
| Review of TLF Market Linkages Phase Two | Feb 2004   | Convergent Consulting | Has TLF adapted to shifts in multi-media market?  
Extent of support for online development industry?  
Implications for future schooling market linkages? | Some improvement noted in contracting & other arrangements relevant to market efficiency.  
IPR issue not fully resolved.  
Concern about under preparedness & under resourcing of educational authorities (reference to BECTA role in UK). |
<p>| III. PROCESS       |            |                 |                                                                                         |                                                                                                |
| Internal Management |            |                 |                                                                                         |                                                                                                |</p>
<table>
<thead>
<tr>
<th>Title (short form)</th>
<th>Date</th>
<th>Author</th>
<th>Summary Scope of Review</th>
<th>Summary Results/Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance of Initiative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLF Governance Report</td>
<td>Dec 2001</td>
<td>Hickey (Finlaysons)</td>
<td>Advice on government structures, in particular: - number of roles of AESOC members - delivery of the Joint Venture within the Phase Two plan, and - generation of competition.</td>
<td>Eighteen procedural recommendations including recommendations for more detailed advice on sensitive aspects of governance.</td>
</tr>
<tr>
<td>Potential Conflicts of Interest for CC in Relation to TLF</td>
<td>Feb 2002</td>
<td>Finlaysons</td>
<td>Advice on potential conflict for AESOC members between their roles on CC Board (CC as developer of content) &amp; as Steering Group for TLF (TLF as purchaser of content).</td>
<td>Review actions one of initial governance recommendations. Four recommendations for action by CC. Joint Venture to make tender process as public as possible.</td>
</tr>
<tr>
<td>Half Yearly Governance Review</td>
<td>Aug 2002</td>
<td>Hickey (Finlaysons)</td>
<td>Review response to previous recommendations. Identify any new governance issues.</td>
<td>All previous recommendations actioned, except: - IP Management Plan not yet available, and - JV still to consider impact of tender process on small companies Four new recommendations on particular issues the responsibility of CC Board members, CEOs of JV companies &amp; jurisdictions.</td>
</tr>
<tr>
<td>Title (short form)</td>
<td>Date</td>
<td>Author</td>
<td>Summary Scope of Review</td>
<td>Summary Results/Recommendations</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Systems Development Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectual Property Management Plan</td>
<td></td>
<td>(Finlaysons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Governance Review 2002-03</td>
<td>Oct 2003</td>
<td>Hickey (Finlaysons)</td>
<td>Assess operation of TLF governance structures, processes &amp; practices over previous 12 months.</td>
<td>All governance aspects well in hand. Three recommendations concerning appropriate handling of modifications to tendering processes then under consideration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Governance Review Aug 2003- May 2005</td>
<td>Sep 2005</td>
<td>Hickey</td>
<td>Assess operation of TLF governance to May 2005.</td>
<td>All previous recommendations actioned. TLF is operating in accordance with the governance framework, &amp; objectives of framework are being achieved.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Finlaysons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance Advice 2006-2008</td>
<td>undated</td>
<td>Hickey</td>
<td>In relation to the Online Curriculum Content Investment Agreement, advice on options for elevating policy issues to AESOC &amp; for a check &amp; balance mechanism to manage conflict of interest &amp; accountabilities.</td>
<td>Appropriate to allow CC to be directly accountable for its deliverables provided Board plays strong monitoring role. A TLF governance model combining a Lead Taskforce &amp; a standing AESOC policy sub committee comprising Chairs of the CC Board, the ICT in Schools Taskforce &amp; AESOC to elevate policy issues to AESOC should be effective in assisting TLF in achieving its responsibilities. CC must have in place robust procedures to identify &amp; monitor conflict of interest.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title (short form)</td>
<td>Date</td>
<td>Author</td>
<td>Summary Scope of Review</td>
<td>Summary Results/Recommendations</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>IV. RECEPTIVENESS OF USERS TO LEARNING OBJECTS</td>
<td></td>
<td></td>
<td></td>
<td>Recommended that</td>
</tr>
<tr>
<td>Report on Pedagogical Trial of learning objects in ACT Schools</td>
<td>Dec 2003</td>
<td>Chapuis</td>
<td>Reports on effectiveness of different pedagogical models for integrating learning objects into classroom practice.</td>
<td>- learning objects be released on CD-ROM forthwith</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- PD workshops to find effective ways of integrating PLs into classroom practice</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- trial learning content management systems</td>
</tr>
<tr>
<td>Field Review of Schools Online Curriculum Content Initiative Report of Stage 1</td>
<td>May 2004</td>
<td>Murdoch University Centre for Learning, Change &amp; Development</td>
<td>Evaluate the pedagogical application of learning objects at systemic, school &amp; teacher levels. Identify key components impacting on the application &amp; effectiveness of the learning object model &amp; learning objects, including curriculum provision, pedagogy, resourcing &amp; PD. Twenty classes in fourteen schools involved.</td>
<td>learning objects have a valuable role to play in the classroom. Many observations, including</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- evidence of benefit to both gifted &amp; lower achieving students</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- preliminary evidence of learning outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- without appropriate facilities &amp; technical &amp; operational support uptake of the LO model is likely to be limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- PD must be a priority if the model’s full potential in the classroom is to be achieved, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- TLF should continue to improve its educational design, content procurement &amp; quality assurance processes.</td>
</tr>
<tr>
<td>Exploring Learning Objects</td>
<td>Aug 2004</td>
<td>Internal</td>
<td>Snapshot of data from conferences &amp; workshops between March and July 2004..</td>
<td>A high proportion of respondents indicated they would use learning objects with students</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- small number of negatives noted</td>
</tr>
<tr>
<td>Exploring learning objects with Teachers of Indigenous Students</td>
<td>Sep 2004</td>
<td>Internal</td>
<td>Snapshot of data from workshop of teachers in Moree area..</td>
<td>High proportion of participants they are likely to use learning objects with students. Range of concerns noted from minority of teachers.</td>
</tr>
<tr>
<td>Title (short form)</td>
<td>Date</td>
<td>Author</td>
<td>Summary Scope of Review</td>
<td>Summary Results/Recommendations</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------</td>
<td>-------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Does the Use of Online Curriculum Content Enhance Motivation, Engagement & Learning? | May 2005| Freebody    | Summary of pilot review of implementation of learning objects to date in 6 very different schools (500 teacher & 1700 student respondents). Conclusions relevant to maintenance of this implementation. | Strong prima facie case that  
  - use of learning objects supported enthusiastically by teachers, parent home tutors & students  
  - learning objects motivate students, & enhance their learning & interest in learning  
  Teachers need time to select appropriate learning objects.  
  Technical difficulties confronting both teachers & systems.                                                                                          |
| Learning by Design Maths learning objects in certain Melbourne Catholic Schools   | Dec 2004| Clarke & Gronn | Study findings from 6 Catholic primary schools in Archdiocese of Melbourne. Tria of Number & Measurement strands of Maths learning objects.                                                                                   | Schools with robust infrastructure, easy classroom access & curriculum & technical support for teachers exemplify how pedagogy rather than technology can be the focus to embed ICT into the curricula.  
  Teachers approached learning objects with caution, as with other factors associated with change.  
  Teachers needed time to understand the possibilities offered by learning objects- upskilling of teachers important to realise full benefit of learning objects.  
  Students related to learning objects enthusiastically (unless insufficiently challenging).  
  Indications of differentiation of curriculum to meet needs of individual students.                                                                                                                  |
| Early-stage Use of TLF learning objects in Schools                               | Jan 2006| Freebody    | Summary of field review of early-stage implementation of learning objects. Recommend on next steps.                                                                                                                     | Strong responses to learning objects from teachers & students as to both learning outcomes & engagement in learning across all teacher & student demographics.  
  Considerable variation in pattern of responses within & between learning objects.  
  Major variations in awareness & usage of learning objects in schools, & in extent to which learning objects are integrated into learning programs.                                                                                      |
OTHER DOCUMENTS EXAMINED

Phase Two Plan, 2001-2006, TLF, June 2001
Phase Two Plan 2005-2006, TLF, May 2005
Learning in an Online World series
  • School Education Action Plan for the Information Economy, Dr Martyn Forrest, 2000
  • Learning Architecture Framework, MCEETYA, 2003
  • Content Strategy, MCEETYA, 2003
  • Bandwidth Action Plan, MEETCYA, 2003
  • Research Strategy, MEETCYA, 2003
  • Bandwidth Implementation Plan, MEETCYA, 2004
  • Pedagogy Strategy, MEETCYA, 2005
  • Online Curriculum Content Investment Proposal, 2006-2008
Cost-effective of Shared Development of Online Curriculum Content Beyond 2005, TLF (Claire Murray), January 2004
Cost-effective Options for Online Curriculum Content beyond June 2006, AESOC Secretariat, July 2004
TLF Steering Group
  • Sustainable Provision of Online Curriculum Content Beyond 2005, November 2003
  • The Readiness is All: Implementing The Learning Federation, May 2003
Approach to Managing Intellectual Property Rights, internal TLF summary, July 2004
Various other TLF & AESOC & Steering Group internal planning & position papers
Australia’s Future Using Educational Technology, DEST (Spring Consulting Services), 2004
Intellectual Property Project, TFG, 2004
Digital Content Industry Roadmapping Study, AIMIA, April 2005
Appendix – Summary of interview list

Interviews with a broad group of stakeholders proved to be the most valuable source of information for the review. They were conducted face to face, by telephone or through a written questionnaire. Each interview was based around a common format and set of issues.

Below is an indicative list of the organisations we consulted. It is not exhaustive because we often made enquiries with elsewhere to check facts or test the views that had been presented to us. We commonly spoke to people from several different units within the larger organisations, sometimes together but often individually. The range of personnel was very broad, including CEOs, company directors, senior executives, education specialists including curriculum staff, ICT specialists, academics, liaison staff, those charged with substantial reform, and those focussed on day to day operations.

Association of Independent Schools of NSW
Association of Independent Schools of Tasmania
Austrade
Australian Advanced Distributed Learning Partnership Laboratory
Australian Education Union
Australian Government Solicitors
Australian Interactive Media Industry Association
Board of Studies NSW
Cadre Design
Catholic Education Commission, NSW
Catholic Education Office of Western Australia
Concord Australia Pty Ltd
Curriculum Corporation
Department of Communications, Information Technology and the Arts
Department of Education, Science and Training
Education departments in
  • ACT
  • Northern Territory
  • NSW
Queensland
South Australia
Tasmania
Victoria
Western Australia
education.au
ICT in Schools Taskforce
Independent Schools Council of Australia
Language Australia
Multimedia Victoria
myinternet Ltd
National Catholic Education Commission
National Institute for Quality Teaching and School Leadership, now Teaching Australia – Australian Institute for Teaching and School Leadership
New Zealand Ministry of Education
Nine Lanterns Pty Ltd
The Le@rning Federation
Tradestart
Victorian Curriculum and Assessment Authority
a number of academic institutions

We also spoke to many teachers across several States and Territories. In the main, they were classroom teachers but this group also included principals, those involved in distance education, and teachers working temporarily in field support or central office roles. They came from a wide variety of schools and professional circumstances: primary and secondary; a mix of subject specialties; experienced and more recent to the profession; urban, regional and isolated; public and private sectors; large and small schools; and different socio-economic and educational patterns among their students.

And finally, we spoke to children of all ages who welcomed us into their classrooms and revealed to us most clearly of all the extent to which...
digital resources can improve their learning outcomes and engagement with education.
Excluding students, we consulted with just under one hundred stakeholders.
11. Appendix – Thematic textual meta-tagging

The analysis of qualitative data using coding

Qualitative data such as interviews, observations, documentary artefacts, and surveys presents particular challenges in analysis and interpretation.

The process has been described in the following way, “In qualitative research (i.e., research relying primarily on interviews, observations, document collection) analysis proceeds by sifting through these raw (or if transcribed, semi-raw) pieces of information and deciding what each portion represents.” Very quickly, this results in too great a data burden to be handled rigorously. Nuance is lost and various forms of analyst error, not least of which is the difficulties in retrieving who said what and in what context, can become acute.

These and other difficulties are magnified when multiple analysts are involved, each bringing a subtly different interpretation to the transformation of raw information into data and then to the interpretation of that data, and where there is polymorphous data (mixed data types applying to the same analysis).

One method to manage these challenges is to use coding. Coding involves the application of meta-tags to fragments of text or other content elements. These tags can identify certain characteristics of the data (e.g. the interviewee expressed a strongly negative view about issue X) or they can describe the context of the data (e.g. they describe who the interviewee is or their organisational level more than what they said). This ability to apply both context and values to quantitative data is fundamental to the discovery of patterns, relationships, internal contradictions and ambiguity in the information. Importantly, codes can be nested and overlap. This allows a rich layer of significance to be added to the raw sources.

The various codes are organised into thematic areas, which then form the analytical typology for the project. Suitable software can then be used to automate the process of identifying relationships and other data. Coding also allows for the calculation of inter-rater reliability using non-parametric statistical techniques such as Cohen’s Kappa (the level of agreement beyond chance when two or observers are classifying the same data set into two or more exclusive categories). This helps reduce problems arising from differing interpretations between analysts.

The following text is an example of thematic textual meta-tagging.

Original text from an interview

R: Well, my high school was known as a trouble school. There were a lot of fights, and kids, uhm wandering around, and most of us worked in factories on the [city’s] east side. Most of us parted rather than worked.

---


Dr Weinstein is Associate Professor of Science Education at Kent State University. His research interests include pedagogy in science education.

4 We used the application TAMS Analyser v3-31b5 available from http://tamsys.sourceforge.net/, released under the GPL and Apple Public Source Licence.

5 This example draws heavily on Weinstein, M (2005), op. cit., p 40.
The following is an example of a simple relationship identified through coding. In this example, the meta-tags ‘positive reason’ and ‘negative reason’ are mapped to the meta-tag gender that has two sub-tags, M and F.

The numbers are the count of the various relationships in the data set. These can be tabulated and, where appropriate, parametric and non-parametric statistical techniques can be used to test significance and other measures.

Some results

Approach

We restricted our use of thematic textual meta-tagging to the contemporaneous records of interview we created for the various stakeholders to whom we spoke, and to the written submissions sent in by some stakeholders. We did not code the various component reviews both for practical reasons and, as discussed in Chapter 1, because they proved to be a much less useful source than originally envisaged.

We used the techniques described above to codify the views expressed by stakeholders and to identify any correlation between various characteristics (i.e. contextual factors) and those views. In the main, this provided a test of the patterns we observed from the interviews rather than revealing any new relationships or insights.

We limited our use of statistical analysis because the data sets were relatively small and to avoid the common but incorrect practice of imposing a quantitative ‘veneer’ in order to add supposed weight to what are, in reality, professional judgements that we have made.

ibid, p65.
Indicative results

It is not our intention to publish much of the output of the thematic or statistical analysis in this appendix. Our findings and conclusions are set out in the body of the Report, and it is unlikely that an array of graphs and numbers would aid even the most informed reader. This is consistent with the common use of thematic textual analysis as a tool for the researcher rather than a method of reporting findings. In this respect, much qualitative research differs from the practice with quantitative analysis.

Nevertheless, some of the analysis we used provides a useful indication of the strength of views expressed by stakeholders, and the importance of contextual factors. For example, there was

- a statistically significant relationship (p<.01) between a positive view of the products of the TLF and how closely associated the interviewee had been with those products. This was independent of whether the association was in the specification or development of the products or as a teacher making use of those products in the classroom
- no statistically significant difference between the overall view about the products of the TLF held by stakeholders from different jurisdictions or systems, or between the various classes of stakeholders such as teachers, technical IT personnel or central office staff
- statistically significant support (p<.05) for the TLF’s organisational performance, governance arrangements and approach to consultation among the various classes of stakeholder where sufficient interviewees responded on those issues to allow analysis
- statistically significant support (p<.01) for the IP and licencing regime among the various classes of stakeholder where sufficient interviewees responded on those issues to allow analysis, and
- a statistically significant relationship (p<.05) between a negative view of current discovery and access arrangements and how closely associated the interviewee had been with TLF products. This was independent of whether the association was in the specification or development of the products or as a teacher making use of those products in the classroom.
12. Appendix – Infrastructure development
The Learning Federation Phase Two Plan 2004-2006 states that ‘School educations systems and sectors will be the primary delivery mechanism for teachers to access the learning objects available through the Initiative.’ The aim of this survey is to gather information that will allow TLF to provide appropriate support for system and sector delivery of TLF content to schools. TLF has created this standardised reporting form to gather information at this and future meetings of the Exchange Consultative Committee:

<table>
<thead>
<tr>
<th>Download from Exchange into own repository</th>
<th>Distribution and access to content</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td><strong>Current</strong></td>
<td><strong>Plans</strong></td>
</tr>
</tbody>
</table>
| 1. How are you currently downloading content from the Exchange into your own repository?  
   E.g. Download content from the Exchange using BELTS 1.1.3 and then manually upload the content into our own repository. | 3. How is content currently being delivered to schools?  
   E.g. Selected high-bandwidth schools access content from a centralised portal. The content is then cached locally at the school to reduce ongoing bandwidth costs.  
   Regional schools receive 1 CD per term, included as part of a professional development kit. | 6. What are your future plans for delivery and access to content?  
   What is the timeline for these plans?  
   E.g. Our portal will be expanded to include example lesson plans from July 2005.  
   Full scale use will depend on role out of professional development and end-user technical support. Current plans are to roll these out to 500 schools in 2005, and the remainder of schools in 2006. |
| 2. What are your future plans for downloading content from the Exchange? What is the timeline for these plans?  
   E.g., We plan to upgrade to BELTS 1.2 by June 2005. Our longer term plan is to add a LORAX interface to our repository and directly download content. | 4. How many schools are trialing content?  
   How many have moved beyond trialing into full use of content?  
   E.g. 15 ‘lighthouse’ schools are currently involved in trialing content. | 7. What support would be appropriate for TLF to provide over the next 12 months to assist with your planning and roll-out?  
   E.g. We require a granular understanding of the intellectual property rights covering 3rd party materials contained in TLF content.  
   We would appreciate support for implementing LORAX into our own repository. |
| 5. Are there any technical issues that TLF should be aware of arising from the trials?  
   E.g. Some of our schools cannot access the content using the Mozilla Firefox browser. Is TLF considering support for this browser? | | |