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The value of the intellectual capital created by
The Learning Federation
digital curriculum content initiative

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Executive Summary

The project

The Centre for the Economics of Education and Training (CEET) has reported that The Learning Federation (TLF) Initiative has built considerable capital in the form of cooperative arrangements among jurisdictions that have ‘helped to deliver cost-effective digital content to improve teaching and learning in Australian and New Zealand schools’ (Long, North and Burke 2009). This report complements the earlier CEET report by shifting the focus from tangible results to the intangible benefits that flow from TLF’s intellectual capital.

This second project drew on the work of the first study, MCEETYA documents, academic writings on intellectual capital, as well as interviews with officials from five jurisdictions.

Methodology

A recent Australian study (Binney, Guthrie, Boedker and Nagm, 2007) found that systems for valuing tangible investments were often applied to ICT investments with the result that much of the value created was underestimated. ICT investments are usually judged by a cost/benefit analysis, built on a business case. The focus is on quantifiable benefits – these are considered to be the ‘primary benefits’, while qualitative benefits are regarded as ‘secondary’ or ‘soft’ benefits, even though:

...the value able to be derived from the intangible value of ICT investments can be up to nine times the tangible value identified in the original investment case (Brynjolfsson et al 1997 in Binney et al 2007).

Of particular relevance to TLF, this study also found that the benefits of ICT investments can extend well beyond the boundaries of the organization.

To avoid the drawbacks in applying a narrowly defined cost/benefit analysis to ICT investments, the CEET study used an alternative method based on Binney *et al*’s ‘tripartite model’ of intangible resources, which uses categories of human, structural and relational capital as organisers. This method is underpinned by the following understandings:

- The system that results from the ICT investment will have intangible value in its own right. The ‘system’ in this context includes all parties and stakeholders including partners, clients and the broader community etc, as well as all components, processes, applications, software and hardware infrastructure etc, which comprise the ICT system. The value of the ‘system’ can be tangible or intangible.
- The system changes and becomes part of, or enables, a ‘bigger system’. As it does, it changes and enhances the value of this ‘bigger system’. In the public sector this ‘bigger system’ could be part or whole of government or extend to all stakeholders. It may also enable new and bigger systems. (The ‘bigger system’ is analogous to the collaborative effect and benefit of ICT investments.)

Interviews

Interviews focused on the intellectual capital of the TLF and the intangible benefits that have and might continue to flow from that capital. The main types of value identified in this report are summarised below. Consistent with the literature, much is intangible, rather than tangible and interviewees pointed to value beyond the boundaries of the initiative and those directly involved.

Tangible value	Intangible value
Cost savings	<ul style="list-style-type: none"> ◆ Fostering a national view and approach to digital education. ◆ Enabling co-operation, collaboration and mutual learning across borders and agencies ◆ Setting standards for high quality digital curriculum content based on educational soundness and promoting greater awareness of these standards. ◆ Fostering the production of digital resources for educational purposes. ◆ Promoting a culture of learning about the effective use of digital sources in schools and policy settings to support this. ◆ Promoting innovation and growth in the effective use of ICTs in schools leading to improvements in teaching and learning. ◆ The building of a foundation for future work.

The interviewees re-affirmed some of the tangible benefits identified in the earlier report, but drew attention to several further areas of cost-saving not considered previously:

1. Cost savings arising from the ability to use and modify the source codes for TLF learning objects as the basis for producing new learning objects.
2. Cost savings from the availability of SCOOTLE (the TLF system delivering digital content to schools)—for smaller jurisdictions in particular the ability to use SCOOTLE (and to integrate it with other systems and link it to state content repositories) has eliminated the need to purchase an alternative commercial system (although interviewees also drew attention to ways in which SCOOTLE could be improved).
3. Cost savings in cataloguing digital resources—the establishment of a thesaurus of terms (ScOT) and a single cataloguing system through TLF has saved staffing costs for jurisdictions.

The main aspects of TLF’s intangible value identified in interviews were:

Human capital

- ‘Re-invigorating teaching’ by driving the use of ICTs, innovation and their effective use
- Encouraging a larger number of content producers and providers (cultural organizations, multimedia organizations and publishers) to participate in providing digital content
- Working with cultural institutions in making material available to schools (individual jurisdictions do not have the same capability to tap resources nationally)
- Building knowledge and expertise and creating a pool of people with knowledge of appropriate standards and specifications
- Creating fertile ground for the work of the next stage of the expansion of digitally-based teaching in schools.

Structural capital

- Creating a ‘national asset’—not just a pool of accessible and usable high-quality digital content, but robust quality systems and technical and content quality standards
- Enabling a central infrastructure
- Developing a ‘critical mass’ of quality-assured digital content that can act as exemplars
- Setting high standards for quality content and raising awareness of them (e.g. W3C standards)
- Increasing the production of digital content
- Advancing ‘educational soundness’ and documenting new pedagogies through research and evaluation
- Providing a capacity to manage intellectual property (IP) nationally
- Building pedagogical soundness into digital resources and strengthening links between digital content and pedagogy.

Relational capital

- Providing leadership in the design of effective interactive content
- Creating a space and culture for collaboration and co-operation across jurisdictions including a common language and standards for working together
- Creating an environment to promote the testing and refining of ideas
- Promoting ‘inclusivity’ through a variety of feedback processes (including among teachers)
- Through support for Contact Liaison Officers (CLOs)—ensuring a sense of ownership of the initiative at a jurisdictional level, carriage of the initiative within the state, and state input into the initiative
- Creating and supporting networks for sharing ideas, progress, stories and building intellectual capability
- Promoting Commonwealth-state collaboration that will also have future value
- Providing the foundation for further collaborative work on what resources should be developed and produced
- Encouraging cooperation rather than competition among participants.

Looking Forward

From mid 2009, the Learning Federation Initiative will move into a new phase and a new policy environment. A shift in direction is both required and appropriate and is expected to involve:

- A move toward more diverse sources of digital content away from a central funded initiative
- A move to a ‘base service’ in growing new ‘green’¹ digital content for schools
- The provision of on-demand services
- New governance arrangements.

Major elements shaping the new environment for ICTs in education are:

- A national vision for ICTs in education articulated in *The Joint Ministerial Statement on ICT in Australian education and training: 2008-2011*
- The roll out of *The Digital Education Revolution* – an Australian government initiative
- The pending adoption of a *National Curriculum* for Australian schools

¹ ‘Green’ resources have a high level of educational ‘wrap’, curriculum effectiveness and are free of all future copyright remuneration when used in schools. They allow the teacher to spend less time preparing resources and adapting them to student need and more time focusing on the student and the learning outcome (AESOC 2008).

- The development of an *E-Learning Business Model* – a collaborative project across jurisdictions.

The developing context for ICTs in education in Australia will provide an environment in which the TLF intellectual capital will become more valuable. It is an environment that emphasises both the roles of ICTs in education and the cooperation among jurisdictions in their deployment. Brokering and monitoring agreements between jurisdictions, for instance, are likely to become more central to TLF's role.

Maintaining the currency of TLF's various forms of tangible and intangible capital would be prudent. Reflecting the accelerating speed with which knowledge can change and grow, knowledge-based assets tend to become redundant at a faster rate than many other assets. Without ongoing attention to currency, TLF digital resources, for instance, may become outdated. To allow this to happen would be to fail to make the optimum use of the substantial investment in the initiative. Maintaining both the tangible and intangible capital is likely to be less expensive than starting again.

Beyond this minimum, the new policy context provides opportunities to leverage TLF intellectual capital to create significant further value and to accelerate progress toward the national vision for ICTs in education set out in the Joint Ministerial Statement. Those jurisdictions participating in The Learning Federation Initiative put a high value on its potential to contribute to further and future work: failure to take up leveraging opportunities risks squandering this potential – with potential negative implications for both the effective use of the resources and the overall effectiveness of new policies and programs.

Introduction

This paper explores the main forms of intellectual capital (IC) that have been created by The Learning Federation (TLF) digital curriculum content initiative. It considers the types of intellectual capital created, its value to the project and to stakeholders, and the benefits that have flowed from the creation and use of this IC. The paper also considers the potential future value of this IC as the initiative moves into a new phase from July 2009.

In the context of knowledge expansion and the shift to knowledge-based economies *Intellectual Capital* become a key performance driver for organizations of all kinds. While the term has a variety of usages, most commonly it refers to knowledge-based assets, many of which are intangible, in contrast to the physical and financial resources of organizations. Knowledge-based assets are valuable for all types of organizations, but particularly for those that are technology-driven and/or dependent, such as The Learning Federation Initiative.

This paper complements a report prepared by CEET in 2008-2009 evaluating the returns to jurisdictions from their participation in The Learning Federation Initiative and options for future funding. That report found that the initiative had built cost effective digital curriculum resources and considerable capital in the form of cooperative arrangements among jurisdictions, which have 'helped to deliver cost-effective digital content to improve teaching and learning in Australian and New Zealand schools' (Long, North and Burke 2009).

The paper has four main sections:

1. A background section discussing the concept 'intellectual capital'; the major elements of intellectual capital; and methods for valuing intellectual capital.
2. A section reporting the main elements of TLF intellectual capital and how each contributes to the work of the initiative.
3. A section discussing the tangible and intangible value of TLF intellectual capital, based on consultations with representatives of five educational jurisdictions.
4. A final section discussing the future value of this intellectual capital in the context of the initiative's changed environment and the new role from mid 2009.

Background

What is Intellectual Capital?

‘Intellectual capital’ is a term that is primarily used to denote the assets of an organization that are built on knowledge and that are often intangible in nature, in contrast to physical resources such as buildings and land (physical capital) and financial resources (financial capital). For instance intellectual capital (IC) often refers to the skills and expertise embodied in the people of an organization, the organization’s internal systems and its external relationships. In addition the term ‘intellectual capital’ is used to refer to knowledge-based tangible assets such as copyrights and patents.

The role of intellectual capital in driving the performance of organizations of all kinds has strengthened with the advance of technology and the shift from industrialized to knowledge-based economies. Where an industrial woollen mill of the nineteenth century relied principally on physical resources such as buildings and machinery, an organization creating computer software in the 21st meets customer needs and creates value to a greater extent through the effective management and use of its IC. For this reason, IC has been described as ‘the new wealth of organizations’ (Stewart 1997).

Knowledge-based assets (IC) differ in characteristics and behaviour from physical and financial assets, thus as the role of IC has strengthened, managing and using their IC effectively has presented organizations with some new challenges. Traditional methods and approaches are inappropriate—new tools and ways of thinking are essential. The main differences are:

- Tangible assets are scarce commodities. Knowledge is abundant and growing. It can rise in value at the same time as it grows.
- Tangible assets are depleted through use. Knowledge can grow even while being used.
- Tangible assets used for one purpose are not available to be used for another. Knowledge can be used for many different purposes.
- If tangible assets are sold or transferred they are not retained. Knowledge can be sold or transferred many times and still retained.
- Tangible assets can be re-possessed – e.g. if sold they can be bought back. Once transferred or sold, knowledge cannot be reclaimed.
- Tangible assets exist in space and time. Knowledge exists in time, but not in space – it can become obsolete in time but exists independently of place.

Economics, accounting practice and many regulations and laws are based on the characteristics of tangible assets. The scarceness of a commodity is reflected in the value people place on it so that gold (scarce) is usually worth much more than sand (abundant). When assessing the value of a company, accountants measure the value of its tools and equipment. Regulators have specified different forms of property ownership and grounds for re-possession. In the case of knowledge-based assets, different ways of measuring, reporting and managing are essential to maximise the benefits that can be derived from them.

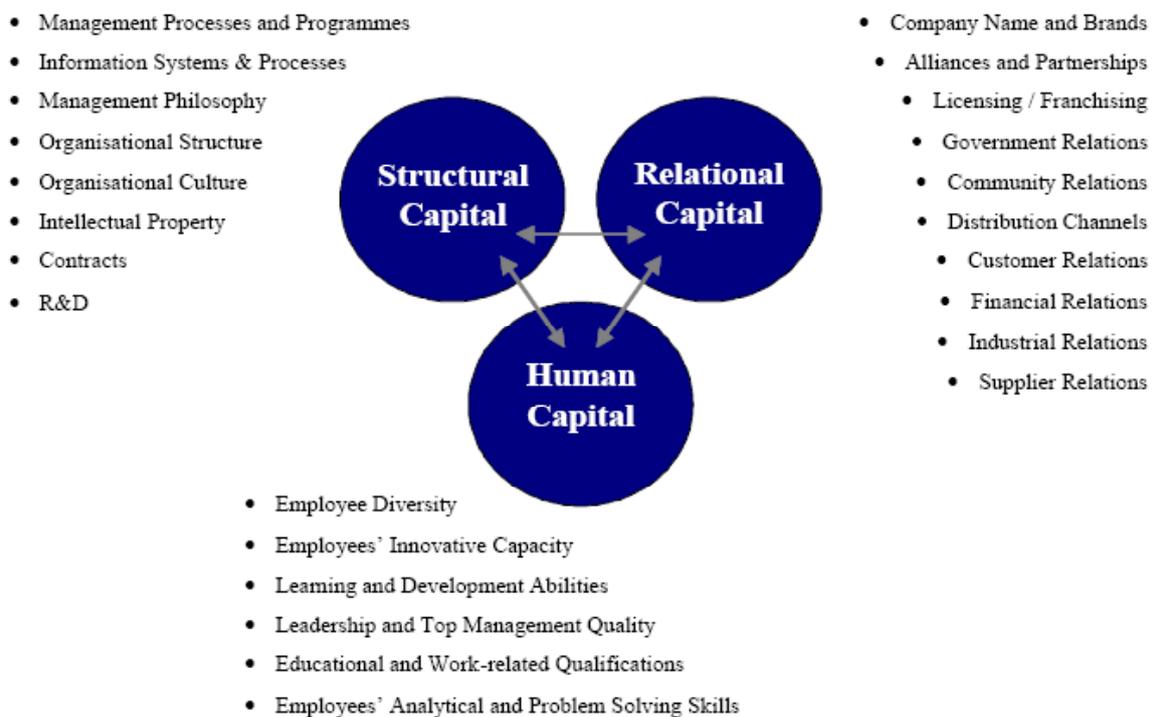
Types of Intellectual Capital

Models for exploring intellectual capital and assessing its value tend to break it down into a number of component elements. Human capital is invariably one of these elements and the others vary in how they are disaggregated and named, but models generally consider the internal systems and

structures of the organization and its external relationships. A ‘tripartite model’ recommended for Australia disaggregates the intangible resources of an organization into three groups: human capital, structural capital and relational capital (Figure 1).

- *Human capital* is the skills, knowledge, motivation and abilities of the people in the organization.
- *Structural capital* is knowledge embedded in the structure of the organization, such as values, culture, processes, digital data systems, policies and procedures.
- *Relational capital* is knowledge embedded in people outside the organization, such as stakeholders, customers, suppliers and government agencies. It also includes the reputation of the organization and its brand.

Figure 1: The Tri-partite Model of Intangible Resources



Source: Binney, Guthrie, Boedker and Nagm 2007.

The three elements are interlinked and support each other. For instance structural capital is essential for capturing the knowledge embodied in human beings. External relations are supported by staff attitudes and skills and by systems and processes for managing them. However, the elements can also detract from each other:

Human and structural capital reinforce each other when an organization has a shared sense of purpose combined with an entrepreneurial spirit and management places a high value on agility and governs more by carrot than stick. But they destroy each other when too much of what goes on isn't valued by customers or the corporate centre attempts to control behaviour rather than strategy (adapted from Stewart 1997).

Each type of IC plays a slightly different role:

- Human capital is critical to innovation such as new ways of working, new products and services.
- Structural capital is essential for capturing human capital and critical to efficiency – it can reduce waste (e.g. by eliminating duplicate work) and enable faster problem-solving (e.g. through the sharing of knowledge).
- Relational capital promotes knowledge transfer (e.g. market intelligence) and can be critical to the competitive advantage of commercial organizations.

Identifying, assessing and using each type of intellectual capital wisely presents varied challenges for organizations. In the case of human capital these include:

- Identifying the knowledge, skills and abilities of their staff that can be useful, for not all will be relevant.
- Identifying where there are gaps.
- Capturing knowledge to enable it to be retained and shared, e.g. by codifying it in data systems, policies, procedures, etc.
- Retaining staff to ensure that human capital is not lost when an individual leaves the organization.
- Developing human capital through experience, education and training.
- Renewing and extending human capital through staff recruitment.
- Maintaining and increasing staff motivation.

For structural capital the challenges include:

- Capturing both ‘soft knowledge’ (eg. about what works and where) and ‘hard knowledge’ (knowledge that is rules-based, such as a spell checker).
- Selecting or creating systems that will enable knowledge to be easily captured and accessed.
- Maintaining up-to-date knowledge systems, for knowledge can quickly become obsolete.
- Ensuring that systems are user friendly – both for those contributing and those seeking information.
- Encouraging staff to contribute to knowledge systems.

For relational capital the challenges include:

- Understanding who are customers and stakeholders and their needs and wants.
- Maintaining and increasing customer loyalty.
- Maintaining and increasing stakeholder ‘buy in’.
- Sharing information with customers and stakeholders (what, how much and how)
- Learning from customers and stakeholders (e.g. acquiring and applying feedback).

Valuing intellectual capital

While there is now widespread recognition of the value of intellectual capital, quantifying and demonstrating this value is no easy matter:

...despite consensus as to the value of intangible, knowledge-intensive resources there is limited agreement among practitioners, professionals, policy makers and researchers as to how to ‘measure’ report and account for these ‘invisible resources’.

(Guthrie, Petty and Johanson, 2001)

A failure to recognise critical intangible resources can have negative consequence, for instance it may affect decisions about resource allocation and investments. Yet these resources are often

overlooked. One example is that professional accounting standards restrict recognition of intangible resources to those that are identifiable, can be reliably measured, are controllable or are acquired from a third party:

...the result is a continuous focus on tangible resources, bottom line results and prioritisation of short-term financial performance, setting aside the qualitative, intangible aspects of organizational wealth and sustainability.
(Binney *et al* 2007)

Differences in the characteristics and behaviour of tangible and knowledge-based assets mean that their value cannot be assessed in the same way. One difficulty is that intellectual capital is not a fixed asset, but ‘a living, dynamic entity’, whose value is ‘constantly changing, as it reflects changes in human understanding, acceptance and use’. Its value may increase over time, or may decline then increase again – perhaps in a cyclical pattern².

Knowledge-based assets do not always have clear ownership. Some, such as patents, trademarks and copyright, can be owned and sold like tangible assets. Others, such as human capital, cannot be wholly owned or their ownership may be contested. Some can be ‘owned’ and controlled but not separated out and taken to market, e.g.: research and development that is still in progress, reputational capital and business processes (Hunter 2002, Blair and Wallman, 2001).

Being able to identify and value their intellectual capital is particularly important in the case of organizations that have much larger investments in human, structural and relational capital than in tangible assets such as buildings and equipment. The focus on tangible assets that exists in financial statements gives an incomplete and misleading picture of such organizations’ resources, how they are used, their impacts and their potential to support future work and create greater value. For these reasons, alternative methods for assessing and reporting intellectual capital have been developed (see Appendix One for further information about Intellectual Capital Statements and examples drawn from one statement, developed to supplement a financial report).

Many organizations that depend on knowledge-based assets are also highly dependent on – and driven by – technology. For instance the literature on intellectual capital notes the difference between Microsoft and enterprises that work on a more traditional industrial model. For much more of what Microsoft does, traditional investments in buildings and machinery are less important than the ideas and creativity of their staff, their systems for capturing knowledge and their channels for receiving and communicating knowledge. This is the case also for The Learning Federation Initiative – its work and success is highly dependent on the skills and knowledge of its staff and others who contribute to its work, to the systems in which it captures knowledge, and to its interactions with external bodies and individuals.

A particular issue for IC-dependent organizations – and thus also when considering the IC of The Learning Federation Initiative – is the value of ICT investments. Investing in ICT is different from investing in machinery to make a single tangible product (widgets). Differences include:

- Without adaptation, a machine for making widgets, makes only widgets. Hardware and software can be used for many different purposes.

² (www.alamedai.com/alamedavc/pdf/value.pdf).

- The outputs of a widget machine cannot be increased beyond a certain point, regardless of the skill and creativity of its operator. The outputs of ICT investments are highly dependant on the skills and creativity of users.
- A widget machine creates value by producing a tangible (and marketable) product. Much of the value that is created through ICT investments is intangible, i.e. knowledge-based and not necessarily (or readily) marketable.

These differences are often overlooked. A recent Australian study (Binney, Guthrie, Boedker and Nagm 2007) found that systems for valuing tangible investments were often applied to ICT investments with the result that much of the value created was underestimated. ICT investments are usually judged by a cost/benefit analysis, built on a business case. Costs include: the costs of hardware and software acquisition and of staff involved in the design, development and delivery of the system, the costs of implementing the system such as changes to processes, staff training, potential disruptions to service, etc. Benefits are both quantitative (usually expressed in financial terms) such as improvements in efficiencies, headcount reductions, reductions in inventory holdings and improved cash flows; and qualitative such as improvements in customer service, systems standardisation, processes aligned with best practice, and support for rapid decision making. The focus is on quantifiable benefits – these are considered to be the ‘primary benefits’, while qualitative benefits are ‘secondary’ or ‘soft’ benefits, even though:

...the value able to be derived from the intangible value of ICT investments can be up to nine times the tangible value identified in the original investment case
(Brynjolfsson and Yang 1997 in Binney *et al* 2007).

Of particular relevance to TLF, the study also found:

- That in their unpredictability, ICT investments are more like research and development projects than more traditional investments.
- That the benefits of ICT investments can extend well beyond the boundaries of the organization.

To avoid the drawbacks in applying a narrowly defined cost/benefit analysis to ICT investments, the study proposes an alternative method based on the ‘tripartite model’ of intangible resources discussed earlier, underpinned by the following understandings:

The system that results from the ICT investment will have intangible value in its own right. The ‘system’ in this context includes all parties and stakeholders including partners, clients and the broader community etc, as well as all components, processes, applications, software and hardware infrastructure etc, which comprise the ICT system. The value of the ‘system’ can be tangible or intangible.

The system changes and becomes part of, or enables, a ‘bigger system’. As it does, it changes and enhances the value of this ‘bigger system’. In the public sector this ‘bigger system’ could be part or whole of government or extend to all stakeholders - as in a national level system. It may also enable new and bigger systems. (The ‘bigger system’ is analogous to the collaborative effect and benefit of ICT investments.)

A given ICT investment may introduce a new ICT infrastructure –this infrastructure has an enabling benefit for the organization initiating the investment in that it may allow the integration and provisioning of other services, a likewise additional benefit may exist if it can also be leveraged by other government departments as part of the ‘bigger system’.

If the elements of intangible value that exist in the system (at either level) when delivered can be identified prior to project initiation then they can be incorporated and considered in the initial ICT investment justification and evaluation process.

Actions are required to realise the intangible capital value of either the new system or the bigger system
(Binney *et al.* 2007).

From this study, Table 1 provides an example of the model when applied to identification of the future intangible value of ICT investments. It shows that each element of the tripartite model is considered separately and discussed in the ICT context.

- The first column of the table represents an intangible value element.
- The second column discusses the element in the ICT context.
- The third column maps tangible and intangible benefit ‘outcomes’ identified in the ICT evaluation literature to the elements.
- The fourth and fifth columns indicate whether the intangible value may exist at both a system level (for example, department level) and/or at the ‘bigger system’ level, (for example, a whole of government level or nationwide levels, that include citizens, service providers, multiple and specialist agencies).

Table 1: Example of model for assessing the future value of ICT investments

Intangible element	In ICT context	Related outcome/benefit	Applies to the system	Applies to the bigger system
Company name and brands (example of relational capital)	Does the ICT investment re-enforce, support or detract from the organization’s desired image?	<ul style="list-style-type: none"> ▪ Improving organizational image ▪ Supporting branding, including positioning and changes to customer perceptions. 	Yes	Yes if the result of the investment is also associated with other services, or parts of the ‘extended’ organization.
Management processes and programs (example of structural capital)	Does the ICT investment support management programs? Does the ICT investment capture the organization’s processes? Does it provide more instant and up-to-date information?	Support for business strategy Market share, growth, competitive advantage, improved efficiency and effectiveness.	Yes	Unlikely unless there are shared programs and processes.
Employee diversity (example of human capital)	Does the ICT investment support the organization’s need for employee diversity?	Increased technical skills and competencies. Employee engagement and development.	Yes	Possibly, if there is a mechanism for sharing staff.

(adapted from Binney *et al*, 2007)

This framework can be applied at multiple levels to determine the potential change to intangible capital value that may result from any given ICT investment. These levels include the ICT organization itself, the organizational unit implementing the investment or to the ‘bigger system’ of which the ICT investment is a part (Binney *et al* 2007).

Summary

The IC literature and in particular the findings of an Australian study of the intangible value of ICT investments provide some important points to be taken into account when considering the value of the IC of The Learning Federation Initiative:

- IC should be understood as knowledge-based assets, the vast majority of which are intangible in nature.
- Intangible assets differ from tangible assets such as buildings, equipment and financial resources in both characteristics and behaviour.
- IC should be understood as comprising human, structural and relational capital.
- It is important to look beyond quantitative measures of the return on investment in ICT. The intangible value arising from these investments is much greater than the tangible value and therefore should be considered as the primary rather than the secondary benefits.
- ICT investments are closer to research and development projects than to traditional investments.
- The benefits of ICT investments can extend far beyond the boundaries of the organization.

The Intellectual Capital of *The Learning Federation Initiative*

Context: *The Learning Federation Initiative*

The Learning Federation is an initiative of the Australian government, the governments of the states and territories and the New Zealand government. It was commissioned by the Ministerial Council of Employment, Education, Training and Youth Affairs (MCEETYA) as a mechanism through which governments could agree on common standards for sharing curriculum-relevant digital content and create and share that content. The initiative is managed by the Curriculum Corporation.

The primary goal of The Learning Federation is to support students' learning of key concepts and skills through the development and delivery of digital curriculum content for schools. Prior to the creation of the initiative, there was a dearth of curricula-linked and relevant digital content available for use in schools. This presented a barrier to the more effective and more widespread use of ICTs for learning.

TLF activities and funding have been in three phases:

- Phase 1—July 2000 to June 2001 – scoping work
- Phase 2—July 2001 to June 2006 – a developmental phase
- Phase 3—July 2006 to June 2009 – a mature phase with large amounts of content being delivered.

In working toward the achievement of its primary goal the initiative has faced some significant challenges, including that participating jurisdictions were – and still are – at different stages in a journey towards full implementation of ICTs in schools. Each has different capabilities and resources, needs and goals and there were – and remain – some differences in the outcomes they were seeking from the initiative. Establishing a common vision and common ground on which to build progress was an early imperative.

A further significant challenge has been ensuring interoperability – that the systems for storing and delivering digital content integrate equally well with the many different ICT systems and software products adopted for use in schools across jurisdictions (rather than favouring a single system).

Other major challenges have been:

- Identifying and preparing digital content from multiple sources – including negotiating and managing relationships with cultural organizations such as museums and libraries and with external suppliers of multimedia services.
- Ensuring the quality, relevance and educational integrity of all digital content produced.
- Developing a system for storing the digital content that enables it to be readily retrieved.
- Developing a system for searching digital material that allows users (teachers and students) to easily find and retrieve what they seek.
- Dealing with issues of copyright at a central point, so that jurisdictions and schools face no further copyrights issues or costs.

Figure 1 illustrates the processes created by TLF for developing and delivering online curriculum content. TLF has developed an interoperability framework to ensure that all education systems and schools can access TLF content within their standard operating environments. During the

production and post-production stages, digital material is stored in a repository known as *The Exchange* in a form compatible with the online learning services of the jurisdictions. TLF distributes learning objects and digital resources directly to (mostly) non-government schools through its own searchable exchange (SCOOTLE) and indirectly to (mostly) government schools through their education authorities. The education authorities may tailor material to strengthen its links to the local educational environment, including curriculum.

Material stored in TLF repositories (The Learning Exchange, Metadata Exchange and Sharing Exchange) is enhanced for discoverability through adding ScOT terms – (Schools’ Online Thesaurus) – a set of terms developed by TLF linked to the educational curricula of the jurisdictions. ScOT provides the foundation for SCOOTLE – a TLF-developed search engine that assists teachers and others to find and retrieve material stored and distributed from the TLF repositories – and enables users to browse through a hierarchical structure to discover digital curriculum resources.

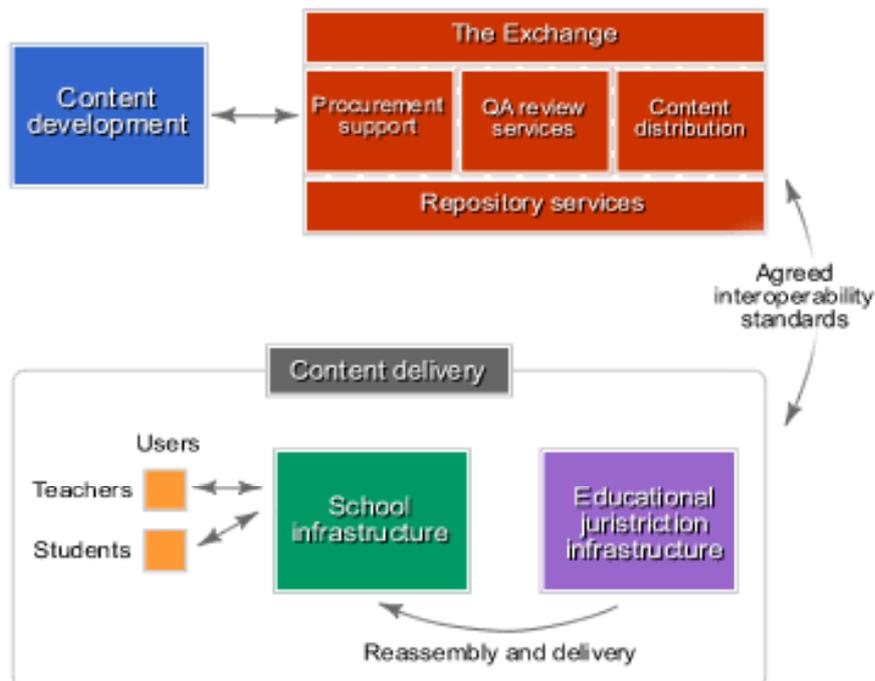
ScOT terms are distributed with the digital curriculum resources as keywords within the metadata and the TLF quality assures the terms in:

- *The Learning Exchange*—the content management and quality assurance system and repository used when TLF is developing digital curriculum resources;
- *The Sharing Exchange* that allows jurisdictions to share digital curriculum resources; and
- *The Metadata Exchange* that retrieves and distributes metadata from partner institutions.

The ScOT terms, as part of the metadata, aid the discovery of digital curriculum resources within the portals of jurisdictions and commercial vendors who distribute TLF content to schools.

Figure 1:

**Development and delivery of
online curriculum content**



TLF both develops and sources digital material. Following consultation with stakeholders and other educational experts, TLF either commissions new digital curriculum content from private multimedia firms or obtains licences to use existing content from cultural institutions, jurisdictions and the private sector.

When content developers submit material TLF tests the content for pedagogical and technical integrity and once it is accepted, breaks it down into stand-alone learning objects. Each of these is tagged with intellectual property information and educational metadata. Similarly, TLF adds value to content sourced from project partners, such as cultural and scientific organizations by:

- Assessing the content for educational value.
- Digitising the content so that it can be accessed electronically by teachers and students.
- Adding a description of the content for teachers and a statement of its education value including detailed contextual information relevant to key learning areas.
- Subjecting the content to a quality assurance process that ensures it meets high educational, editorial and technical standards.
- Adding metadata that ensures the material can be easily located in a search.
- Embedding copyright information into each learning object.

TLF's licensing arrangements ensure that schools incur no copyright liability when their teachers use these resources. All copyright fees are paid upfront, so schools are not liable for further copyright payments. Management of copyright is supported by Content Rights Information System Project (CRISP), a database developed by TLF for storing and managing copyright information for each item of digital content stored in The Exchange.

Intellectual Capital

The TLF Initiative has both created and drawn on substantial stocks of all three types of intellectual capital - human capital, structural capital and relational capital.

Human Capital

Of central importance to the achievement of the goals of The Learning Federation Initiative are the knowledge, skills and attributes of the staff directly employed within TLF project management office.

Of the 61 staff members (current as at April 1st 2009), almost two-thirds have been with the initiative for at least two of the three phases of its development (Table 2). Staff retention is important not only because staff recruitment can be costly and time consuming, but also because it increases both expertise and efficiency (through the accumulation of experience and on-the-job learning) and because the knowledge of individuals – even knowledge that is critical to the organization – can be lost when they leave.

Critical for realising and increasing the potential of human capital are opportunities for individuals to apply, update and extend their knowledge and skills. An unusual and significant aspect of The Learning Federation Initiative is that the work – and the many different challenges that need to be addressed – has required and brought together people such as teachers and technology experts who rarely have an opportunity to work cooperatively toward shared goals. Just over a quarter of TLF staff members have a teaching background. Working principally in areas requiring pedagogical knowledge (e.g. as editors of digital content, or in learning design) they co-ordinate with technical experts such as programmers and information system specialists, as well as with copyright

specialists. These interactions offer unique opportunities for personal and professional learning and development, for all those involved.

Based on job titles Table 2 categorises TLF staff members into several groups according to the main type of work performed. The main aim of the categorisation is to illustrate the range of expertise among the staff members, but it also gives an indication of the allocation of human capital, which signals the priorities given to particular tasks and aspects of organizational performance. The categorisation shows that TLF's human capital comprises expertise in four main areas:

- The application of ICTs for educational purposes.
- Technology development and implementation.
- Copyright management.
- Relationship management.

The right hand column indicates the role of this particular element of intellectual capital in the context of The Learning Federation Initiative. Each aspect of human capital makes a different contribution toward the achievement of the goals of the initiative.

Table 2: TLF Human Capital

Staff	no	%	IC in context
Staff Retention – staff with TLF for 2 phases or more	39	63	Staff retention ensures knowledge retention and development and cost-effectiveness.
Staff with teaching background	16	26	Expertise ensures the pedagogical integrity of digital content.
Staff who are project managers/ co-ordinators	15	24	Project management and expertise is essential for project-based work.
Staff editing digital materials	11	18	Expertise ensures that the materials developed reach a high standard.
Staff in technical-specific roles and multimedia analysts	11	18	Technical expertise is essential to the design and implementation of effective programs and to inter-operability.
Staff in copyright-specific roles	5	8	Expertise ensures educational jurisdictions do not face copyright costs when using content.
Staff in user-relations specific roles (communications, specialist users, user interfaces)	5	8	Expertise ensures user needs are met and supports relationships with external organizations and individuals.

In addition to the human capital embodied in the staff of the TLF, the structure of The Learning Federation Initiative as a collaborative venture means that it has access to the human capital embodied in people from external organizations including educational jurisdictions and external experts. Three such conduits of human capital include:

- *The Learning Federation Consultative Committee (LFCC)*
This committee provides TLF with advice on the development and deployment of digital curriculum content and the technical systems, specifications and standards required to support interoperability. Two representatives from each jurisdiction are members of the LFCC - one

with curriculum expertise and one with information systems expertise. The committee meets face-to-face twice a year and is regularly consulted by the TLF throughout the rest of the year.

▪ *Curriculum Area Reference Groups and working parties*

Reference groups and working parties provide advice on curriculum content in six areas:

- Civics and citizenship
- Early years
- English and literacy
- English as a second language
- Mathematics and numeracy
- Science

Members of these groups are drawn from curriculum experts across the jurisdictions – they are subject matter experts with status within the field. They examine the requirements for online content development in each priority curriculum area and provide advice about the educational scope and specifications of learning objects under development. The work of these groups ensures the pedagogical integrity of the digital content stored in The Exchange.

▪ *Suppliers*

TLF draws on the knowledge and expertise of external suppliers as needed to supplement internal human capital and/or perform specific tasks. Suppliers include education experts, curriculum writers, multimedia developers, instructional designers, editors and technical experts and are drawn from all Australian states with the exception of the Northern Territory.

A particular source of human capital is *The Learning Federation Developers Panel*, a group of suppliers selected through a competitive process conducted during the initiative's main developmental phase (Phase 2). Suppliers are from four Australian states and New Zealand and from both the public and private sectors. Having such a resource is a fast and cost-effective way of accessing additional skills and knowledge when needed with confidence as to quality.

TLF has also worked with over 26 cultural and public institutions to select items within their collection, digitise them and describe their educational value—processes that enhance the value of these resources for teachers and schools. Members of staff from each institution were trained to support the process of readying the content for use by teachers and schools.

▪ *Contact Liaison Officers*

CLOs are key links to jurisdictions. The networking, information and advice provided by CLOs are critical to the initiative. They act as a visible point of contact in each jurisdiction, increasing sense of ownership of TLF Initiative within jurisdictions. They also promote and support access to TLF content and use of that content.

Structural Capital

Structural capital - organizational systems, policies, programs, procedures and culture - is essential for capturing the knowledge embodied in human capital and promotes efficiency by enabling access to stores of knowledge and by reducing duplicated work. The building of structural capital has occurred progressively through the three phases of The Learning Federation Initiative and stocks of this type of intellectual capital are now substantial.

Table 3 indicates the main elements of TLF structural capital and briefly describes them and the role of each element in context. Indicative of the effort of the initiative in building this type of capital, the table shows a large number of elements, some of which also comprise a number of sub-

elements. The development of structural capital reflects substantial investment of \$24.5 million in Infrastructure during Phases 2 and 3.

An important aspect of TLF structural capital is that it also contributes to the growth of relational capital. For instance the organizational culture that emphasises quality and collaborative processes enhances the external image and reputation of The Learning Federation Initiative and promotes stakeholder 'buy-in'. The importance of this aspect of TLF intellectual capital was emphasised strongly in interviews with members of educational jurisdictions.

Table 3: TLF Structural Capital

Structural Capital Element	IC in Context	
Inter-operability framework/standards	Technical solutions that accommodate differences in technological infrastructure and other systems across jurisdictions and education sectors.	<ul style="list-style-type: none"> ◆ Overcome differences between jurisdictions in technological infrastructure, operating systems and software, which previously hindered a national approach to ICTs in education. ◆ Support all education systems and schools to be able to access TLF content within their standard operating environments. ◆ Support wide access to TLF content in an environment marked by evolving operating systems and software, bandwidth constraints and other technological infrastructure issues. ◆ Supports national curriculum and other national initiatives.
Specifications/frameworks	Include: <ul style="list-style-type: none"> ▪ Quality assurance framework. ▪ Project management framework. ▪ Content design specifications. 	<ul style="list-style-type: none"> ◆ Ensure consistency in the quality of TLF content and its pedagogical integrity. ◆ Signal to suppliers and users the TLF commitment to quality and thus build relational capital and promote wider use of TLF content. ◆ Promote efficiency and cost saving in constructing new learning objects.
Digital content and learning object source codes		<ul style="list-style-type: none"> ◆ Availability of TLF content enables and promotes greater and potentially more effective use of ICTs in schools and other educational settings. ◆ TLF content is a potentially marketable product (e.g. pay-per-use). ◆ Source codes are a base resource from which further or modified learning objects can be constructed (cost-savings).
Digital content storage, search and delivery programs	<ul style="list-style-type: none"> - The Learning Exchange. - The Metadata Exchange. - The Sharing Exchange. - ScOT. - SCOOTLE. - SCOOTLE Lite. 	<ul style="list-style-type: none"> ◆ Ensure the retention of the IC embedded in TLF content. ◆ Enable value to be derived from the IC embedded in TLF content by enabling it to be accessed. ◆ User-friendly search and retrieval functions promote use of TLF content and build stakeholder buy-in and user satisfaction.

The value of the intellectual capital created by
The Learning Federation digital curriculum content initiative

Table 3 continued:

Structural Capital Element		IC in context
Delivery arrangements through educational jurisdictions		<ul style="list-style-type: none"> ◆ Enables IC embedded in digital content to be enhanced by modification in each jurisdiction to strengthen links to local factors (e.g. environmental, curriculum) ◆ Potentially increases the value of the TLF content at the local level and thus its likely take-up. ◆ Improves potential for TLF content to meet the needs of teachers and students. ◆ Builds relational capital with the jurisdictions and with TLF content users.
CRISP	A TLF-developed intellectual property management system (CRISP) for creating, distributing and managing intellectual property rights.	<ul style="list-style-type: none"> ◆ Ensures the collection and retention of information about intellectual property rights applying to TLF content. ◆ Enables a national approach to managing copyright issues with efficiency and cost-saving outcomes for educational jurisdictions.
Research and evaluation	Include: <ul style="list-style-type: none"> ▪ Trials of TLF content ▪ Evaluations of aspects of TLF work ▪ Investigations of the use and outcomes of ICTs in schools. ▪ Evaluations of TLF outcomes. 	<ul style="list-style-type: none"> ◆ Informs, supports and verifies the work of TLF. ◆ Provides ideas and evidence that will contribute to improvements in the quality of TLF content and to efficiencies in its production and delivery. ◆ Contributes to transparent accountability of TLF decisions and actions, including use of public funding. ◆ Provides evidence of the value of TLF content. ◆ Provides evidence of the improvements in student learning attributable to more effective use of ICTs in the classroom and information useful to the production of more useful digital content and delivery mechanisms. ◆ Provides evidence of the returns to public investments in TLF.
Organizational Culture	Focus on quality, meeting the needs of users, collaborative and iterative approaches.	<ul style="list-style-type: none"> ◆ Promotes the production of high quality digital content. ◆ Promotes the sharing of knowledge and information and other collaborations. ◆ Promotes continuous improvement in all TLF work

Relational Capital

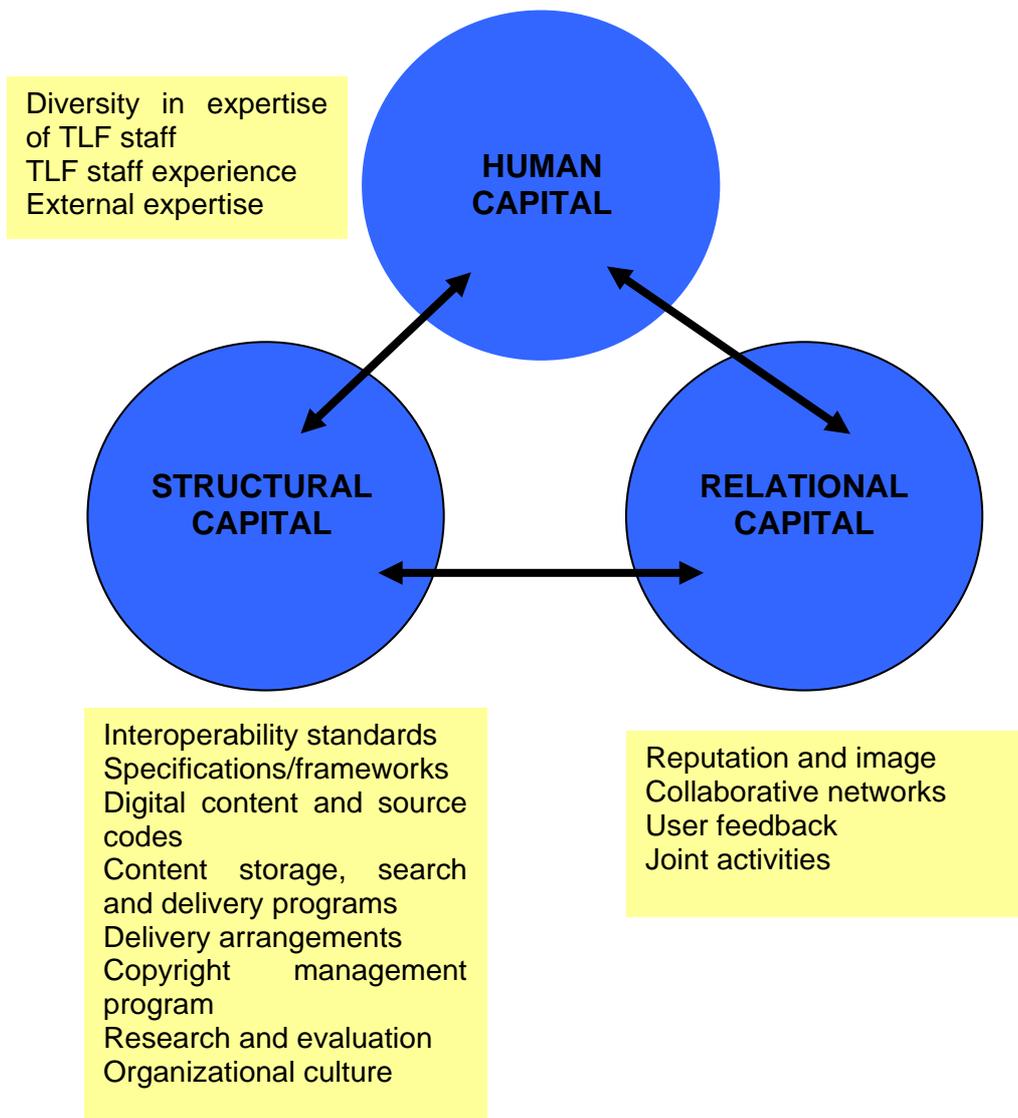
Table 4 indicates elements of the TLF's relational capital. Interviews with members of education jurisdictions point to large stocks that have been built up over the life of the initiative. The survival of The Learning Federation Initiative over a substantial period of time (almost ten years) further indicates high levels of stakeholder 'buy-in' – also a signal of high levels of relational capital.

Table 4: TLF Relational Capital

Relational Capital Element		IC in context
Reputation and image [Built through high quality products, collaborative work, openness to the views of stakeholders and content users.	Promotes joint initiatives, sharing of ideas and information, the use of TLF content, continued investments in The Learning Federation Initiative.
Collaborative networks	<ul style="list-style-type: none"> ▪ Colloquia of Contact Liaison Officers (CLOs) ▪ Learning Federation Consultative Committee 	Networks enable sharing of ideas and information across jurisdictional boundaries and between jurisdictions and TLF. They also provide a conduit for feedback from TLF stakeholders and content users about current content and unmet needs.
User feedback mechanisms	<ul style="list-style-type: none"> ▪ Teacher focus groups ▪ User focus groups (teachers and students) <p>Held as needed to evaluate new TLF content.</p>	<ul style="list-style-type: none"> ♦ Provide feedback to design teams and content developers. ♦ Promote high standard of TLF content and relevance to classrooms. ♦ Indicate focus of initiative on needs of end-users
Joint activities	<p>Include:</p> <ul style="list-style-type: none"> ▪ Joint TLF-Professional Association projects - 3 conducted in 2008-9, several more in 2009. ▪ Work with National Copyright group ▪ Projects with Cultural organizations 	<ul style="list-style-type: none"> ♦ Provide additional means of acquiring ideas for content and assistance with developing content, including testing. ♦ Increase channels for distributing TLF content. ♦ Promote use of content. ♦ Enable copyright issues to be worked out.

Figure 2 summarises the intellectual capital of The Learning Federation Initiative, using the tri-partite model.

Figure 2: Intellectual Capital of TLF Initiative



The Value of TLF Intellectual Capital

To gain an indication of the value of TLF intellectual capital to jurisdictions participating in the initiative, interviews were conducted with government officers from four states – Victoria, Queensland, South Australia and Western Australia – and with an officer of the Australian government.

Interviewees were first asked to indicate what they saw as the main knowledge-based assets of The Learning Federation Initiative and then to describe the value of this intellectual capital overall and for their particular jurisdiction. They were also asked to comment on the future value of this IC as the initiative moves into a new phase.

Main Types of IC

In considering the main knowledge-based assets of The Learning Federation Initiative, representatives of jurisdictions referred to elements across all three sub-categories of human, structural and relational capital (Table 5).

Overall, the most frequently mentioned IC elements were the collaborative networks established through the initiative and the high quality standards set down by TLF for digital curriculum content, as well as the digital content itself. The focus on collaborative networks and standards linked to views that these forms of IC in particular would have a broader application beyond this specific initiative – their value was not just in their contribution to what had been achieved, but in their potential to contribute elsewhere, outside and beyond the life of the current initiative.

Discussed in similar terms were the technical standards developed through the initiative for sharing material and systems across jurisdictions and the growth of knowledge and expertise about ICTs in education at multiple levels (nationally, in education authorities and in schools) as a result of the initiative. The development of technical standards was highlighted as a major outcome of the initiative with potential for a strong future role: enabling future co-operation in creating and sharing digital content – especially in the context of a national curriculum. Similarly interviewees spoke of the knowledge and expertise developed through the initiative as providing a sound foundation for further work at the national and state levels (particularly in further policy development) and for the effective use of digital materials in schools. The findings of TLF research and evaluation were also mentioned as having contributed to the growth of this form of IC.

TLF content delivery systems were also mentioned frequently – with SCOOTLE often praised for the quality of its search and retrieve functions, its user-friendliness and its graphic interface. These forms of IC appeared of special importance to smaller jurisdictions with limited capacity and financial resources to develop, operate and/or fund their own systems. In these cases, the availability of TLF delivery systems was highlighted as a substantial positive outcome of the initiative. As one interviewee noted, “We wouldn’t have a learner management system if TLF hadn’t said *what about delivery?*”

Finally interviewees pointed to TLF intellectual property management system as a valuable intellectual capital element.

Table 5: Main forms of TLF IC identified by interviewees

Human capital	Growth of knowledge and expertise nationally and at jurisdiction and school levels
Structural capital	<ul style="list-style-type: none"> ◆ Standards - technical ◆ Standards - quality ◆ Digital curriculum content and learning object source codes ◆ Digital content delivery systems ◆ IP management systems ◆ Research and evaluation
Relational capital	<ul style="list-style-type: none"> ◆ Collaborative networks ◆ Collaboration with cultural organizations

The Value of TLF Intellectual Capital

When asked about the value of TLF intellectual capital, interviewees identified:

- Value demonstrated by the benefits that have already flowed from the initiative (nationally, to each participating jurisdiction and to others – such as schools)
- Value in the potential of the IC for future and further use.

Moreover, interviewees pointed to growth in value over time. They identified that the value of TLF IC has grown as the initiative has matured – with particularly strong growth in phase three – and that the potential for future value is even greater as national approaches to school curriculum and to digital learning strengthen.

Table 6 summarises the main types of value identified by interviewees. Consistent with the findings of the literature on returns to ICT investments, much of the value identified is intangible, rather than tangible in nature. Also consistent with the literature, interviewees pointed to value (and benefits) beyond the boundaries of the initiative and those who were directly involved.

Table 6: Tangible and Intangible value of TLF Intellectual Capital

Tangible value	Intangible value
Cost savings	<ul style="list-style-type: none"> ◆ Fostering a national view and approach to digital education. ◆ Enabling co-operation, collaboration and mutual learning across borders and agencies ◆ Setting standards for high quality digital curriculum content based on educational soundness and promoting greater awareness of these standards. ◆ Fostering the production of digital resources for educational purposes. ◆ Promoting a culture of learning about the effective use of digital sources in schools and policy settings to support this. ◆ Promoting innovation and growth in the effective use of ICTs in schools leading to improvements in teaching and learning. ◆ The building of a foundation for future work.

Tangible value

In discussing the value of TLF intellectual capital interviews drew attention to cost-savings in five areas:

- The production of digital resources.
- TLF copyright licencing arrangements.
- Access to the digital source codes of TLF learning objects.
- The substitution of SCOOTLE for alternative commercial systems.
- A single cataloguing system for digital content.

Cost-savings for jurisdictions through their participation in The Learning Federation Initiative were explored extensively in CEET's previous report to TLF on the returns to jurisdictions from participation in the initiative (Long *et al.* 2009). This report identified substantial cost savings flowing from cost-sharing in the production of digital resources, with the quantum of the cost-saving dependent on the relevance of the digital resources to jurisdictional curricula:

Cost sharing can be less efficient if cooperation results in a product that is not appropriate for the curriculum of a particular jurisdiction.

Based on two-thirds of products being relevant to state or territory needs, indicative cost-savings were substantial. For instance, in the case of Victoria, it was estimated that access to a digital curriculum resource valued at \$8,000 could be obtained through cooperative arrangements for \$1,483—a cost saving of 81.5%.

The report also identified savings to jurisdictions on copyright costs of such magnitude that:

Subject to future trends in digital usage, digital copy right costs and usage of TLF digital resources ... jurisdictions may recover their full expenditure on the initiative through reduced copyright costs.

In addition, the report projected very substantial cost savings due to increased productivity resulting from enhanced development of human capital through improvements in teaching and learning. It concluded:

Given reasonably conservative assumptions about, for instance, the effect of the use of digital content on the quality of teaching and the proportion of students whose education is improved, ... The estimated economic benefits from the initiative justify its initial and continued funding.

Interviews discussing the value of TLF intellectual capital re-affirmed these cost savings and drew attention to several further areas of cost-saving not specifically considered previously:

1. Cost savings arising from the ability to use and modify the source codes for TLF learning objects as the basis for producing new learning objects. This particular form of cost-saving was raised by one jurisdiction, which noted that the intellectual property licensing arrangements set up through TLF (an element of structural capital) have allowed it to take TLF digital content and 're-purpose it by going back to the source code, editing it, working out new versions and then sharing the results'. Compared with a traditional approach to creating learning objects, based on finding 'gaps' in the resources available, this approach 'allows you to find content that is a reasonable match and edit it'.

Access to source codes means that the end-to-end cost of producing a learning object is substantially reduced compared with cost of creating an object 'from scratch'. Cost savings

are achieved principally because of a reduction in the costs of designing and coding the new learning object – which are usually about 60% of the total costs of production. Estimated at approximately 20-30%, cost savings reduce the average cost of a new learning object by \$2000 - \$3000 (based on an estimated average cost of producing a new learning object from scratch of approximately \$10,000). In addition, further cost savings can be achieved if modified code is able to be used to produce more than one additional learning object – and costs can be shared across jurisdictions.

2. Cost savings from the availability of SCOOTLE – interviews indicated that several smaller jurisdictions have adopted SCOOTLE as their primary mechanism for connecting schools, teachers and learners with digital educational resources. Although these jurisdictions are aware of limitations to the current functionality of the system and are seeking and negotiating its further development, the ability to use SCOOTLE (and to integrate it with MOODLE and link it to state content repositories) has eliminated the need to purchase an alternative system on the commercial market. One jurisdiction indicated that as a consequence of the availability of SCOOTLE it had been able to cancel a contract for renewal of an alternative system, with estimated cost savings of approximately \$150,000 p.a. for the contract and up to \$350,000 p.a. including the costs of staffing and other resources.
3. Cost savings in cataloguing digital resources – interviews indicated that prior to The Learning Federation Initiative jurisdictions were required to undertake this type of work themselves for their own collections. In the absence of a framework of terms this was resource-intensive work. The establishment of a thesaurus of terms (ScOT) and a single cataloguing system through TLF has produced cost savings in staff time - estimated at up to one staff position annually.

Intangible value

In identifying the intangible value of TLF intellectual capital, interviewees pointed to a range of elements (Table 7) reflecting differences in the perspectives of the Commonwealth and the states and territories, as well as many differences between the states in progress towards implementation of ICTs to support teaching and learning in schools; in content delivery and learner management systems; in the kind of issues they face in achieving their goals (e.g. resources and capabilities, geographical distances, teacher resistance); and also in the plans they are making for the future. However, there were some strong recurring themes in their responses:

Fostering a national view and approach to digital education.

Interviews highlighted the fragmented nature of work prior to the creation of The Learning Federation Initiative, marked by competition and duplication across jurisdictions, substantial variations in progress and market failure in the provision of digital resources for schools. As one interviewee put it, TLF created ‘a common rail gauge—with all the efficiencies and savings that this implied’. The common rail gauge is much more than technical specifications—it is a way of thinking and a common language that enables greater understanding and co-operation.

Among the specific outcomes of this approach identified in interviews were:

- TLF has removed one of the impediments to private investment in digital curriculum content by broadening the market for digital content through common standards.
- TLF has created a context in which several aspects of learner management systems are thought of in a less insular manner:

- their capacity to accept TLF content (and hence content from any jurisdiction publishing content to TLF standards).
- their use of curriculum descriptors to assist teachers to find appropriate content, especially in the context of a national curriculum.
- TLF has developed a national approach to the management of intellectual property that has reduced costs and difficulties for individual jurisdictions that hindered the development and use of digital resources.

Mechanisms that have enabled and fostered co-operation, collaboration and mutual learning across borders and agencies

Several interviewees spoke positively about the opportunities they were given – as representatives of their jurisdiction and as individuals – to come together regularly throughout The Learning Federation Initiative. They noted that such opportunities had created ‘a collaborative space and culture’ for working together and for mutual learning that though ‘not a strong element of the original business model’ of TLF had come to be regarded as ‘an exemplar for other projects’. As one noted:

that’s not to say it (TLF Initiative) has been without problems and fault-free, but its collaborative arrangements have been extraordinary.

More specifically, interviewees identified that the ‘framework of communication’ developed by TLF:

- Promoted the creation of relationships between the jurisdictions – especially networks of policy officers and/or Contact Liaison Officers.
- Promoted knowledge transfer between jurisdictions – for instance by enabling policy officers to swap ideas, stories and progress – and not just in relation to digital learning.
- Had built trust between the jurisdictions and other agencies involved in the initiative.
- Encouraged jurisdictions to behave ‘like participants’ in the initiative rather than customers of TLF.
- Enabled the ‘informal’ to ‘feed into the formal’, for instance when policy officers gained new insights and ideas through swapping stories about ‘what works’.

A common view was that the relationships built up through the initiative provided a solid and valuable foundation for further work in the future – both in regard to building digital resources for education but potentially also in other areas. In particular, the initiative had set a new standard – and provided a way forward – for the states and territories and the Commonwealth to work together effectively.

Setting standards for high quality digital curriculum content based on educational soundness and promoting greater awareness of these standards.

All interviewees spoke positively about the value of the standards set by TLF for digital resources. They noted that TLF digital content standards set a high bar for other content producers to follow, including the jurisdictions themselves, and would provide a minimum for all future content development – wherever development occurs.

In addition, interviewees indicated that quality standards had risen progressively throughout the initiative as knowledge grew through testing, feedback and research and evaluation – especially in relation to pedagogical soundness. As a result they indicated current high levels of confidence in the quality of TLF content and in its appropriateness for use in schools. TLF

standards were described as ‘platinum’ or ‘cutting edge’ and TLF quality assurance systems as ‘robust’.

Interviewees also revealed that awareness of appropriate standards for digital resources at many levels – nationally, within states but also within schools – had increased as a result of TLF work. International recognition of these standards was also highly valued. Jurisdictions indicated that they use these standards both to assess the content they produce themselves and content sourced from external providers. They also indicated that the high quality of the digital content resulting from these standards – especially its educational soundness – promotes usage of the content and thus ensures a greater return on investment in its production.

Fostering the production of digital resources for educational purposes.

Interviewees noted that prior to The Learning Federation Initiative there were few digital resources available and relevant to Australian schools. The initiative has filled this gap by sourcing and creating many resources – so that there now exists ‘a critical mass’ of high quality digital curriculum material - but in addition TLF has fostered the creation of digital resources by others. In part this has occurred as the availability and quality of TLF content has raised the interest of schools and teachers, but it has also occurred through the national collaborative approach that has created a vibrant single market for these resources – attracting greater interest and new content providers.

Interviewees indicated that they expected content would in future be developed or sourced through a much broader range of producers – possibly including commercial publishers who have previously had little interest in what they saw as a small and fragmented market. With content development underpinned by the high quality standards set by TLF the outcome would be a greater wealth of resources for enhancing teaching and learning.

Promoting innovation and growth in the effective use of ICTs in schools leading to improvements in teaching and learning.

Most interviewees pointed to a decline in difficulties around the take-up of digital resources in schools as more TLF content has become available and there has been growth in recognition and assurance of its accessibility, relevance, quality and pedagogical soundness. A common remaining issue was reticence and lack of confidence among some teachers. However, it was noted that TLF had already contributed to ‘re-invigorating the profession for teachers’, ‘re-invigorated students’ and improved the capabilities of teachers. For instance one jurisdiction, has adopted SCOOTLE as its content delivery system and finds that this system is driving teacher use, and demand for use, of digital content because:

- It is a disruptive technology that ‘pulls people out of their taken-for-granted approaches, and leads to adoption of new technology’.
- It links to TLF objects
- It is a vast improvement on previous systems that were over-complex, difficult to use and ‘put off teachers’.

Interviews pointed to a ‘momentum’ in teacher demand for, and use of, TLF content, leading to increases in usage. Several interviewees noted the emergence of greater innovation at the local (school) level as teachers become more familiar with, and gain confidence in, the use of systems and materials – especially interactive whiteboards. For the future, a common concern was to harness this innovation so that it could be shared and developed further.

Promoting a culture of learning about the effective use of digital resources in schools and policy settings to support this.

One of the most valuable aspects of TLF intellectual capital identified by interviewees from participating jurisdictions was its contribution to increasing knowledge and expertise about the effective use of ICTs in education in general, appropriate standards for digital content and about policy settings that would support the use of ICTs, school and teacher take-up of digital resources, and positive impacts on teaching and learning.

Interviews highlighted a TLF culture of enquiry and learning, supported by collaborative networks where ideas and information could be exchanged, by opportunities for informal as well as formal knowledge exchange, by testing and experimentation, by feedback from curriculum experts and users of digital content and by the commissioning of research and evaluation and the use of its findings to make improvements. Significantly, interviewees indicated that this growth in knowledge and expertise provided a solid foundation for further work beyond the current initiative. For instance, one noted that as a result:

A significant number of people now have a list of things (requirements) that will make content available nationally.

- Practical knowledge of what they need to do*
- Knowledge of standards and specifications that apply internationally*
- Knowledge of standards and specifications for how to develop content.*

Another particular area of knowledge growth mentioned was ‘digital pedagogies’ and the potential for this to transform teaching practice.

Interviewees also noted ways in which their own learning had grown through the initiative – and the potential this provided for better, more informed, policy making in the future.

The building of a foundation for future work.

The value of TLF intellectual capital as a strong foundation for future work was strongly emphasised in interviews, with reference in particular to:

- Standards (technical standards and quality standards for digital content) that could be applied to future work and that would enable further sharing of digital systems and resources
- A large body of digital content – a ‘library’ of resources that could be used, modified and expanded further and to which others could and would contribute
- Relationships – that would sustain further knowledge transfer, learning, policy development and innovation such as between jurisdictions and between individuals (policy officers and CLOs)
- Knowledge - a greater understanding that could be applied to further work, for instance in the effective use of ICTs, in effective policy making, in quality digital content.

References were made to these forms of IC as ‘groundwork’ – essential for building secure and stable structures; and as providing ‘fertile ground’ that would enable and encourage further growth. As such, the value of this intellectual capital was primarily in its capacity to enable and in its potential to encourage further work to improve teaching and learning through the use of ICTs in schools.

Table 7: The Intangible Value of TLF intellectual capital

Victoria	Queensland	South Australia
<ul style="list-style-type: none"> ▪ Creating a 'national asset' - a pool of accessible and usable high quality content, robust quality systems and technical and content quality standards. ▪ Enabling a central infrastructure. 	<ul style="list-style-type: none"> ▪ Developing a 'critical mass' of quality assured digital content. ▪ Creating a space and culture for collaboration and co-operation across jurisdictions including a common language and standards for working together ▪ Creating fertile ground for the next work ▪ Creating an environment to promote the testing and refining of ideas. ▪ Strengthening links between digital content and pedagogy. ▪ Providing leadership in the design of effective interactive content. 	<ul style="list-style-type: none"> ▪ Through support for CLOs - ensuring a sense of ownership of the initiative at a state level, carriage of the initiative within the state, and state input into the initiative. ▪ Promoting 'inclusivity' through a variety of feedback processes (including among teachers) ▪ Setting high standards for quality content and raising awareness of them (e.g. W3C standards) ▪ Documentation of new pedagogies through research and evaluation ▪ Advancing 'educational soundness' through research and evaluation. ▪ Creating and supporting networks for sharing ideas, progress, stories and building intellectual capability ▪ Research and evaluation – supporting experimental processes leading to improvements ▪ Increasing the production of digital content. ▪ 'Re-invigorating teaching' by driving the use of ICTs, innovation and their effective use.

Table 7 continued:

Western Australia	Australia
<ul style="list-style-type: none"> ▪ Providing a capacity to manage IP nationally. ▪ Working with cultural institutions in making material available to schools (state doesn't have capacity to the same extent). ▪ Delivering high quality relevant digital resources to schools. ▪ Promoting Commonwealth-state collaboration that will also have future value. ▪ Providing the foundation for further collaborative work on what resources should be developed and produced. 	<ul style="list-style-type: none"> ▪ Encouraging a larger number of content producers (cultural organizations, multimedia organizations and publishers). ▪ Encouraging a collective effort rather than competition. ▪ Building knowledge and expertise and creating a pool of people with knowledge of appropriate standards and specifications. ▪ Building pedagogical soundness into digital resources.

Looking Forward

Since it was created, but particularly in more recent years as it has matured, The Learning Federation Initiative has, in collaboration with participating jurisdictions, schools, multimedia producers and providers, built substantial stocks of intellectual capital across all three dimensions – human, structural and relational capital.

This capital has proved a worthwhile investment, enabling substantial progress to be made toward the goal of improving teaching and learning in Australian schools through the development and delivery of high quality, accessible and relevant digital curriculum content. It has also returned substantial tangible and intangible value to participating jurisdictions and provided a range of benefits.

From mid 2009, the initiative will move into a new phase. The context in which TLF began is very different from that which exists in 2009. As a result of its work there is now (for instance) a substantial bank of high quality digital curriculum content for Australian schools; there are agreed cross-border standards and specifications for this content, and for the technical infrastructure to store and deliver it; there are arrangements that deal with issues of copyright, relationships that drive collaboration and progress and a larger number of content providers. There is also a higher level of expertise in the effective use of ICTs in schools. In addition, a range of policies, initiatives and programs has recently emerged that identify some new issues requiring attention and that are driving change. As a consequence, a shift in direction is both required and appropriate.

This shift is expected to involve:

- A move to distributed sources of content rather than a central funded initiative
- A move to a ‘base service’ in growing new ‘green³’ digital content for schools
- The provision of on-demand services such as:
 - brokering commercial licences (where, for example, several jurisdictions are interested in obtaining, resources from a commercial source);
 - making either ‘red’ or ‘amber’ resources into ‘green’ resources for a provider (for example, obtaining copyright clearances on jurisdictional content, negotiating changes to commercial resources to conform to curriculum need);
 - managing resource development (for example, for targeted programs, or on behalf of a consortium of jurisdictions);
 - sourcing resources and making them ‘green’ (for a consortium of states, a program or a single client);
 - tailoring existing services and tools (for example, adapting *SCOOTLE* to the specific needs of a client); and
 - assisting industry in the production and licensing of ‘green’ digital curriculum resources for the National Curriculum.
- New governance arrangements (AESOC 2008)

³ The green, amber, red traffic-light colour code is a shorthand indicator for curriculum resource quality. Red represents digital resources with no educational quality overlay, amber resources are those with some quality and usability overlay and ‘green’ resources have a high level of educational ‘wrap’, curriculum effectiveness and are free of all future copyright remuneration when used in schools.

‘Green’ resources allow the teacher to spend less time preparing resources and adapting them to student need and more time focusing on the student and the learning outcome (AESOC 2008).

An important consideration in this shift should be to maintain and sustain TLF intellectual capital and to ensure that its potential to realise further value and benefits can be realised. ICT will continue to change and standards and content can rapidly become obsolete. The expected increasing emphasis on ICTs in education will provide on-going demand for the partnerships, networks, understandings, skills and knowledge developed around the digital online content initiative. Their value, however, will depreciate without on-going institutional support and, if allowed to run down, will only need to be reinvented later, probably at greater cost.

A Changed Context

Recent policies, initiatives and programs are changing the context within which the initiative has been operating. The future of educational digital content and infrastructure will be influenced by the following considerations.

A National Vision

Efforts to improve teaching and learning in Australian schools through the use of ICTs are strengthening as Australian governments work toward the achievement of a ‘national vision’ set out in *The Joint Ministerial Statement on ICT in Australian education and training: 2008-2011*.

This statement recognises that ICTs are transforming the curriculum and changing the way in which teachers and students operate, learn and interact. It articulates a vision of the future in which:

Australia will have technology enriched learning environments that enable students to achieve high quality learning outcomes and productively contribute to our society and economy.

To achieve this vision, the statement commits Ministers to:

National collaboration across Australian education and training jurisdictions and sectors to share resources and expertise, and to leverage existing initiatives while recognising the importance of innovation and experimentation.

Digital Education Revolution

The *Digital Education Revolution (DER)* is an initiative of the Australian government that aims to advance ‘sustainable and meaningful change to teaching and learning in Australian schools that will prepare students for further education and training and to live and work in a digital world’. The initiative provides funds for:

- Schools to update and expand their technology resources
- Teacher professional development in the use of ICTs
- Improved broadband connections for schools
- The development of online learning to support and promote participation by parents
- Support mechanisms to assist schools in deploying ICTs
- Online curriculum tools and resources for students and teachers.⁴

One of the challenges facing this initiative is that the states and territories are at different stages in their journey toward the long-term goal, and have local needs and priorities that need to be addressed. Recognising this, a strategic plan guiding the implementation of the Digital Education

⁴ www.deewr.gov.au/Schooling/DigitalEducationRevolution

Revolution (DEEWR 2008) supports a joint Commonwealth/State and Territory approach in which local priorities are articulated in state plans and supported by national initiatives. Such an approach it says will lead to ‘greater efficiencies and better outcomes’. More specifically the plan seeks:

- Coherence between Commonwealth, State and Territory based initiatives
- Implementation plans that are balanced and sustainable at the school and sector levels
- Effective leverage of existing infrastructure and programs

The strategic plan provides a brief analysis of the current state of ICTs in education, noting where improvements are needed, and aspirational goals (Box 1). Among the concerns it identifies are variations between schools in access to technologies and to resources such as TLF digital content. Aspirational goals thus look to an improved range of resources as well as to greater access to these resources and their more effective use.

The plan indicates that as the DER matures over a 4-5 year period, its emphasis will shift. In its early stages the DER will concentrate on ensuring a more even and improved distribution of digital resources, while in its later stages more attention will be given to the most effective ways in which these resources can be used.

Box 1: ICTs in education

Current state	Variation in schools’ access to technologies Variation in student access to ICTs Limited access to online information Quality of digital content variable Variable deployment of TLF content E-learning often separate from mainstream learning Barriers to innovation Barriers to access to online resources.
Areas where improvements are needed	Infrastructure Learning Resources Teacher Capability Leadership
Aspirational Goals	All students have personal access to an appropriate information access and/or computing device in all areas of learning <ul style="list-style-type: none"> ▪ Teachers devise student-centric programs of learning that address agreed curriculum standards and employ contemporary learning resources and activities. ▪ Students engage in rigorous and stimulating programs of learning that meet their individual needs and prepare them for future success ▪ Courses and resources are available anywhere, anytime ▪ Parents view student programs and progress at anytime online and communicate with teachers and school leaders ▪ Students and teachers routinely collaborate, build and share knowledge using digital technologies ▪ Students and teachers innovate in their use of ICT to achieve learning outcomes. ▪ School leaders routinely plan at the school and system level for ongoing improvement enabled by ICTs

Source: Adapted from Table 1, DEEWR 2008

National Curriculum

A third important element in the new context for The Learning Federation Initiative is the pending adoption of a *National Curriculum* for Australian schools. The development of this curriculum follows a historic agreement by the Council of Australian Governments (COAG).

The National Curriculum will outline the essential skills, knowledge and capabilities that all young Australians are entitled to learn, regardless of background or location. It is expected 'to invigorate a national effort to improve student learning' through the establishment of 'essential content and achievement standards' (National Curriculum Board 2008). It is also expected to facilitate the interstate movement of school students.

Overseen by a National Curriculum Board, whose members include representatives of each state and territory as well as education experts, development of the curriculum (which will cover students from kindergarten to Year 12) is beginning with English, Mathematics, the sciences and history. Plans are to have a national curriculum in these areas publicly available for delivery in all jurisdictions from January 2011. Development of further areas will follow (www.ncb.org.au).

Technologies and technological development will be taken into account. The National Curriculum Board notes that:

The development of a national curriculum will impact on, and be impacted by, other significant areas of reform such as assessment, pedagogy and technology. National curriculum will need to be future-oriented and exploit the potential of the new technologies of the current century.

(National Curriculum Board 2008)

Flexibility to accommodate some local differences and priorities and a collaborative approach are also considered important. Among the principles the National Curriculum Board has set down to guide the development of the National Curriculum are:

The curriculum needs to be flexible. It must allow jurisdictions, systems and schools the ability to deliver national curriculum in a way that values teachers' professional knowledge and reflects local school and regional differences and priorities.

National curriculum needs to be developed collaboratively with jurisdictions, systems and schools across Australia

(National Curriculum Board 2008)

E-learning Business Model

A final contextual element of importance is the development of an *E-learning Business Model*. Since late 2008 a sub-group of the Australian Education Systems Officials Committee (AESOC) has been working at the request of MCEETYA to develop a draft national e-Learning Business Model.

The final model is expected to include:

- A national e-learning conceptual model for digital resources discovery, development, storage and sharing
- The commercial and technical arrangements associated with the proposed e-learning model
- A framework for collaboration/brokerage post June 2010 providing value-added services

- Relevant existing DER and AICTEC⁵ online curriculum and technical support initiatives
- Addressing service delivery options
- Identification of additional work that may be required to design e-learning architecture⁶

The model will thus have implications for teaching and learning beyond Australian schools, and will cover a number of areas that have been within the purview of The Learning Federation Initiative.

Discussions with participating officers point to the development of a more complex supply chain for content than currently exists, with content sourced from multiple providers through a content broker, who deals with issues such as quality, copyright, cataloguing and updating/retiring resources. Content can also be contributed at the local level (e.g. by parents, teachers, students). Content delivery systems may also change – for instance through the development of online interactive learning environments for schools, teachers, learners and parents.

Implications for TLF Intellectual Capital

The developing context for ICTs in education in Australia will provide an environment in which the intellectual capital of The Learning Federation Initiative will become more valuable. It is an environment that emphasises both the roles of ICTs in education and the cooperation among jurisdictions in their deployment. Brokering and monitoring agreements between jurisdictions, for instance, are likely to become more central to TLF's role.

As a minimum, maintaining the currency of TLF's various forms of tangible and intangible capital would be prudent. Reflecting the accelerating speed with which knowledge can change and grow, knowledge-based assets tend to become redundant at a faster rate than many other assets. Without ongoing attention to currency, TLF digital resources, for instance, may become outdated. To allow this to happen would be to fail to make the optimum use of the substantial investment in the initiative. Maintaining both the tangible and intangible capital is likely to be less expensive than starting again.

Beyond this minimum, the changed context provides opportunities to leverage TLF intellectual capital to create significant further value and to accelerate progress toward the national vision for ICTs in education set out in the Joint Ministerial Statement. Those jurisdictions participating in The Learning Federation Initiative put a high value on its potential to contribute to further and future work: failure to take up leveraging opportunities risks squandering this potential and would be a poor use of resources – with potential negative implications for both the effective use of the resources and the overall effectiveness of new policies and programs.

Human Capital

The emergence of a pool of people with enhanced knowledge and skills in the development, deployment and effective use of ICTs in education is a significant outcome of The Learning Federation Initiative. It was recognised in interviews with participating jurisdictions as already having contributed to better policy making and as having the potential to make a substantial further contribution.

⁵ The Australian Information and Communications Technology in Education Committee (AICTEC) is a national, cross-sectoral committee responsible for providing advice to all Australian Ministers of Education and Training on the economic and effective utilisation of information and communications technologies in Australian education and training and on implementation of the *Digital Education Revolution* (www.AICTEC.edu.au)

⁶ www.curriculum.edu.au/mceetya/elearning_business_model_working_group,26676.html

The new context clearly provides an opportunity to leverage this expertise to enhance the effectiveness and efficiency of new policies, programs and initiatives and to contribute to the national vision for ICTs in education. The skills and knowledge built through The Learning Federation Initiative are highly relevant and applicable, for instance, to The Digital Education Revolution and the E-Learning Business Framework and potentially of substantial value in supporting the roll-out of the National Curriculum.

Action is advisable to ensure that the current pool of expertise is maintained; that the pool is able to grow; and that advantage is taken of the skills and expertise in this pool. For instance, this could include:

- Providing opportunities for the skills to be applied wherever and whenever they might be useful.
- Growing these skills by providing the individuals concerned with challenging work, with opportunities for further training and with formal and informal opportunities to learn from each other. .
- Growing the pool of expertise by providing opportunities for the sharing of skills and knowledge, such as through mentoring, collaborative work and communities of practice.
- Facilitating the sharing of knowledge between jurisdictions.

Structural Capital

The Learning Federation Initiative has created large amounts of structural capital, including digital content, content quality standards, technical specifications and content storage and delivery systems. The new context offers many opportunities to leverage these intellectual capital elements to provide benefits in the efficient use of resources and in more effective policy-making. For instance:

- Standards and specifications evolve over time – TLF standards and specifications can be used to provide an advanced starting point to build opportunities for future sharing of content and to address any changes in standards required by changes in ICTs in education. Using and modifying existing standards and specifications has potential cost advantages over creating completely new work and also capitalises on the knowledge embedded in the construction and modification of the original work.
- Digital content delivery system – there is potential to expand further the uptake and usage of digital content by schools and teachers by building on the strengths of the existing system and addressing any weaknesses, e.g. by increasing functionality.
- Digital resources – there is substantial potential to use existing TLF digital content as the basis for new content through adaptation and updating. For instance, one state is already using TLF learning object source codes to create new learning objects – with significant cost savings compared with developing a learning object ‘from scratch’. There is potential to expand this activity further, including to other states.

In addition, a strong element of TLF structural capital is the research and evaluation that has been conducted. This work offers a potential source of valuable information for guiding future decision-making in relation to ICTs in education and for ensuring that work toward the national vision proceeds on a sound and informed basis, thus also minimising the risks of potentially costly errors. It is thus also important the findings of this work be maintained; be advanced and be disseminated widely but especially to those directly and indirectly engaged in emerging initiatives.

Relational Capital

The processes for collaboration across jurisdictional boundaries established through The Learning Federation Initiative and the relationships that eventuated have been identified as among its most valuable outcomes. In interviews with officers of participating jurisdictions they were noted as providing ‘a way forward’ for the Australian and state/territory governments to work together formally, but they were also acclaimed for the informal and unofficial ways in which they had enabled the exchange of ideas, information and stories. Interviewees emphasised the value of these interchanges and their outcomes in greater mutual respect, as well as in learning and more effective and efficient policy-making.

The emphasis placed on collaborative approaches in the Digital Education Revolution, the development and implementation of the National Curriculum and the E-learning Business Model presents an opportunity for leveraging this TLF Relational Capital. For instance, ways of working together across jurisdictional boundaries have the potential to make a further and possibly substantial contribution to more effective policy making and more efficient use of resources e.g. through the exchange of information about ‘what works’ and pitfalls and mistakes to avoid, including potential costly failures.

Relational Capital can run down rapidly and be squandered if relationships are not sustained, are allowed to dissipate through neglect, or sour through misunderstanding. It would thus be wise to provide ongoing opportunities, both formal and informal, to sustain and grow the existing relationships so that they can survive and thrive beyond The Learning Federation Initiative. This could be done for instance by ensuring that individuals who connected through the initiative continue to have formal and informal opportunities to exchange ideas and information and to work together; and can mentor new relationships.

It would also be wise to look to the models for collaboration and feedback that characterised The Learning Federation Initiative and helped to build relational capital as exemplars for other programs. For instance, interviews revealed that the establishment of a person within each state as a first point of contact in relation to the initiative (*Contact Liaison Officers*) was highly valued, having increased ‘buy in’, by providing both a local voice and a local representative for the initiative. Also noted was the TLF model for interaction with schools and teachers: varied feedback mechanisms and testing arrangements, dissemination of the findings of TLF research and evaluation.

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Appendix One: IC statements

Over the past decade in particular, considerable research and development work has been conducted internationally and within Australia exploring different methods by which organizations can report information about their intellectual capital. This work has led to the development of a number of different sets of guidelines for producing ‘intellectual capital statements’. European research suggests that such guidelines are generally adapted to local circumstances and business culture and differ greatly from one to another in their terminology and methodology (THE, October 2006). However, most recommend the use of indirect measures of IC and of narrative material that will provide a context for these measures and a fuller picture of IC impacts.

IC statements have two main purposes: to improve management of knowledge-based assets by identifying what they are, how they are currently being used and potential for future use; and to provide transparent public information that complements information available in reports about tangible assets, such as financial statements.

IC statements take a variety of forms but generally incorporate:

- A description of the organization, its goals, values and structures.
- Information about the management challenges the organization faces.
- Indicators of the organization’s human, structural and relational capital.
- Information and indicators of the impacts of IC.

Preparation of an IC statement involves selection and use of indicators of each of the component elements of IC. The specific IC measures that an organization uses will reflect its strategic goals and vision, its priorities, the availability of data and the purposes of the statement as well as local factors. While there are often overlaps or similarities, the particular measures used in a statement can thus vary substantially from one organization to another. Examples of some measures that are used are:

Human Capital

1. Staff retention and turnover
2. Staff experience and learning
3. Years of experience with the organization
 - a. The ‘rookie ratio’ – (the percentage of employees with less than two years experience)
 - b. The proportion of staff with training plans
 - c. The proportion of staff engaged in training

This example of human capital measures is taken from an IC statement prepared for the Department of Lands, NSW and published as part of the department’s Annual Report 2004-2005. It enables a comparison of results over time with the Department’s ‘desirable trend’. Thus it can be seen, for instance, that the Department hopes to retain staff, but the number of staff has declined over three years:

Employee Demographics	02/03	03/04	04/05	Desirable trend
Number of full-time equivalent employees as at 30 June	1458	1441	1427	→
Average age of employees			45	↘
Learning and development – no of staff attending external courses		246		→
% of staff who identify as NESB	15.3	15.7	15.3	↗
Women as % of full-time staff as at 30 June	34.8	35	36.4	↗

Structural Capital

Examples of indicators of structural capital include:

- The number of new patents, copyrights and trademarks
- new sets of standards, procedures

The Department of Land's IC statement uses service delivery as an indicator of internal capital, with two specific measures:

- number of website hits
- the use of electronic feedback mechanisms

Relational Capital

1. Customer satisfaction

- loyalty (repeat business)
- increased business share
- resistance to incentives from competitors.

2. Alliances

- the number of joint activities and their returns
- shared processes
- the financial health of key suppliers and buyers

The Department of Lands IC statement uses two measures of external capital:

- The number of significant community and statutory bodies involved a representative of the Department
- The number of research partnerships.

Some IC statements also include information about the impact of IC elements. This can also be discursive and/or based on indicators such as:

Human Capital

- The number of new products, services, patents
- Sales of new products as a percentage of all sales
- Comparisons of the gross margins of new and old products

Structural capital

- Value added per unit of knowledge
- The ratio between revenues and sales, general and administrative costs.

The value of the intellectual capital created by
The Learning Federation digital curriculum content initiative

- The number of communities of practice
- Queries to information systems successfully answered
- Suggestions made versus suggestions implemented
- Time to market

External capital

- Net profit per customer per year
- The ratio of new to existing customers
- The value of repeat business.