Hot topic: ICT teaching and learning support services
strategic ICT advisory service
Acknowledgements

The main author of this report is Reece Lamshed. Contributions to the report were made by Alison McAllister and Carolyn Papworth.

Education.au would like to acknowledge the following organisations for their participation in the case studies: Black Forest Primary School, Saint Ignatius’ College, NSW, Chisholm Institute of TAFE, VIC and the Western Australia, Department of Education and Training.

This report is part of the Strategic ICT Advisory Service, funded by the Australian Government’s Department of Education, Employment and Workplace Relations.

The views expressed in this report are those of the authors and do not necessarily reflect the views of the Australian Government.

Publishing details

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1 Executive Summary

The ICT unit in an organisation has a fundamental role to play, as every organisation is now absolutely reliant on ICT to operate and conduct its business. This is also true for the education and training, and how the ICT unit operates will largely determine how successfully ICT will be integrated into teaching and learning practice.

ICT changes constantly, as new products and systems are launched, computer devices become cheaper and more powerful, and access to the Internet becomes more ubiquitous. Recently, ICT has been transformed by three powerful phenomena: Open Source technologies, mobile computing and social networking/self-managing content repositories (grouped together under the banner, Web 2.0). These technologies have transformed the way in which people have engaged popularly with ICT. But so too has the ICT unit been put under enormous pressure to harness the inherent capacities of these new technologies for the organisation.

In dealing with this new ICT environment, the ICT unit has a fundamental challenge – how to manage creatively the tension between innovation on one side and stability and standards on the other. Sometimes burdened by previous modes and cultures of operation, the ICT division can act defensively by resisting change by claiming that these innovations are faddish and undermining, and that they have a duty to provide security, stability, protection and a return on their previous investments.

The challenges in accommodating these transforming technologies are significant: coping with the amount of user help requests, handling the volume of demand on the network, dealing with the innovators who want to trial and experiment with ICT outside the organisation’s system, keeping up with the knowledge of new technologies and systems, keeping up with the speed of change with the national rollout of computers, dealing with frustrations that emerge when the network won’t cope, making sure that ICT decisions are effective and managing user expectations.

The four organisations that we have investigated have collectively provided a dynamic and responsive ICT service model that attends to the day-to-day user demands and the ever-changing ICT environment, but at the same time, maintains standards and security.

The essential and interrelated components of this model are:

1. Sound governance: the ICT unit is represented in and accountable to the highest level of management in the organisation.
2. User-centred culture: the ICT unit adopts a responsive service-oriented mode of operation, following ITIL standards.
3. ICT staff competence: ICT staff are selected on the basis of their competency and capacity to embrace change.
4. Robust infrastructure: the infrastructure is stable, secure, reliable and modular, to enable growth with ever-increasing levels of demand.
5. Open and flexible adoption of software applications: Open Source technologies are critically evaluated and embraced where appropriate.
6. Secure Internet access.
7. Robust and responsive technical operations: central to this is an online and phone help service desk to manage help requests.
8. Vigorous user digital literacy training and mentoring: a continuous, decentralised and highly targeted training regime.

9. Robust communication.

10. Sound performance measures: the performance of the ICT is reviewed regularly against an agreed set of standards and resources allocated accordingly.
2 ICT challenges

The purpose of this study is to provide an insight into the challenges that confront the information and communication technology (ICT) staff or unit within an education institution, the ways in which they deal with these challenges and to propose a model of ICT service that will better engage teaching and learning with ICT.

The study was based on four case studies: a public primary school in South Australia, an independent secondary college in New South Wales, a technical and further education (TAFE) college in Victoria and an education department in Western Australia (see the Appendices for the case studies).

2.1 The changing ICT environment

In the past 40 years since the digital revolution began, we have witnessed phenomenal changes in the way organisations operate, and people live, work, learn and play. The impact of digital technology is ubiquitous, and as never before, our communications, knowledge transfer, productivity and social relationships are manifestly reliant on ICT systems, and most substantially, via the Internet.

Three relatively recent phenomena have transformed the way in which ICT has been utilised.

1. The Open Source movement, which describes a broad general type of software license that makes source code available to the general public with relaxed or non-existent copyright restrictions. This now includes software such as Firefox, Moodle, Thunderbird, Audacity, WordPress, Droople, Joomla; Operating Systems such as Linux, and programming languages such as PHP, Java, Perl. This non-proprietary code enables a community of programmers to work collectively to upgrade, transform and share the products, opening up both the pace and scale of innovation.

2. Wireless and mobile devices. Mobile computing and communication, with sophisticated devices such as the iPhone, Blackberry, Nokia, etc., has massively transformed the way in which business is conducted and people interact with information and each other.

3. Social networking and self-managed content repositories (Web 2.0), conducted entirely using the Internet, represented by host of new communication tools such as blogs, wikis, Facebook, MySpace, Twitter, Flickr, YouTube, LinkedIn, has captured the imagination of millions of people and transformed social relationships and the communications/media landscape.

What these transformations have in common is that they are personal, social (shared), light, agile and to some degree, dispensable.

This trend will most likely continue in the future, although the directions ICT will head are highly unpredictable. Indications are that cloud computing, led by Google and Apple, is the next transforming phase. Cloud computing services provide common business applications online that are accessed from a web browser, while the software and data are stored on local servers. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the ‘cloud’ that supports them.

The actual and potential consequences of these changes are massively more ICT options to choose from; more responsive and engaging systems, and a shift in costs away from software purchase and licensing to network infrastructure, storage and hardware (and, even in these areas, costs are also decreasing).
There is opportunity for further investigation into the use and application of Open Source technologies in government agencies in overseas countries, such as Brazil, France, Germany, to ascertain its effectiveness in large organisational contexts.

2.2 Organisational context

The rapid changes in technology and how it impacts on an organisation is shown in the table below.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Market Demands</th>
<th>Ideal organisation</th>
<th>IT performance criteria</th>
<th>Technology base</th>
<th>IT applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Price</td>
<td>The efficient firm</td>
<td>Efficiency</td>
<td>Mainframe – batch processing</td>
<td>Data processing/ automation of routine tasks</td>
</tr>
<tr>
<td>1970s</td>
<td>Price, quality</td>
<td>The quality firm</td>
<td>Efficiency &amp; quality</td>
<td>Mainframe – batch processing</td>
<td>Functional efficiency</td>
</tr>
<tr>
<td>1980s</td>
<td>Price, quality, choice/delivery</td>
<td>The flexible firm</td>
<td>Efficiency &amp; quality &amp; flexibility</td>
<td>Personal computing</td>
<td>Personal productivity</td>
</tr>
<tr>
<td>1990s and beyond</td>
<td>Price, quality, choice/delivery</td>
<td>The innovative firm</td>
<td>Efficiency &amp; quality &amp; flexibility &amp; innovative ability</td>
<td>Networks</td>
<td>Organizational transformation</td>
</tr>
</tbody>
</table>

(Ward & Daniel, 2006, p. 3)

The challenge for many organisations, including education and training providers, is in keeping up with these ongoing ICT transformations. Many are organisationally lagging behind the common personal experience of their workforce, clients and customers. This is understandable, as the organisation has often made huge investments over a number of years in highly centralised, stable, productivity transforming technologies and infrastructure, and wants to see a return on investment. However, the challenge is how this more cumbersome technology can be sustained when the customer demand is for speed, mobility, flexibility, personalised service and innovation.

The organisation’s ability to adapt to the continuously transforming ICT environment depends on the scale of their ICT responsibility, the degree of control they have over their ICT direction, the level of integration in the organisation’s governance structure, the culture of the ICT unit, the skills and competencies of ICT staff, the relationship the ICT unit has with other sectors of the organisation, the levels of demand on the ICT service and the resources dedicated to ICT.
2.3 Teaching and learning

Teaching and learning is also caught up in this ICT transforming environment.

The new generation of Internet and digital technologies have the potential to transform learning as never before, and to engage students in collaborative learning that previous static technologies have just not been able to do. These new technologies are increasingly less expensive and accessible to more and more people outside the education and training environment. This includes such devices as digital cameras, video cameras, mobile phones, iPods, etc and computer and Internet access to social networking, blogs, wikis, VoIP, etc. This consumer experience is both the foundation to and the example of how effective these technologies are and will be in the teaching and learning environment.

ICT engagement in teaching and learning is highly dependent on the attitudes and ICT skills of the teaching workforce. With an aging workforce, this has been invariably described as 10% resistant and disengaged; 10% engaged and innovating and the rest somewhere in between. The challenge for education and training providers is that their students, in the main, are fast outpacing the teachers in ICT engagement and levels of digital skills.

The levels of ICT engagement in teaching and learning will depend on the school’s degree of autonomy, education level (primary, secondary, TAFE), its governance and culture, its level of ICT infrastructure and resourcing, the internal professional development (PD) and training regimes, ICT unit service model, help request services, change request processes and innovation leadership and mentoring.

2.4 Risk and innovation

When resources are scarce, risk is a real issue, particularly when costs of ICT infrastructure are high (purchase, licensing) and ongoing (replacement, upgrades, maintenance). The issue is that technology systems and software improve continuously, and today’s best is often tomorrow’s second-rate performer. Therefore, it’s not only an issue of what to purchase, but when to purchase.

Proprietary systems, either purchased or licensed, usually act as ‘walled gardens’ that only allow related software integration (eg Microsoft Solutions), which can restrict diversity and flexibility. On the other hand, these systems are acquired because they provide certainty, reliability and standardisation.

The rate of change, including the organisational demand for the speedy introduction of new technologies, is also a challenge for ICT units that are used to slower work tempos and longer planning cycles.

ICT units are therefore often risk averse, and tend to view innovation and experimentation as destabilising and faddish.

Risk aversion, in some circumstances, can engender secretive project implementation in order to lower timeline expectations, and consequently, organisational frustration as promises made, fail to eventuate. In order to protect the large investment decisions, there is a tendency for ICT units to act secretly, envelop decisions in impenetrable and complex technical language, and resist organisational change requests.

On the other hand, innovators test and experiment with the latest ICT tools and techniques in the organisational context, such as teaching and learning. This is where technology is given meaning and value, and when these innovative practices are proven, they become mainstream. The ICT unit is
generally not wise in teaching practices, and therefore they are viewed as not the ones who should be solely determining what is used and how.

This ongoing tension between stability, standards and security on the one hand, and innovation and experimentation on the other, is central to the ITC dynamic. How this tension is resolved within the organisation, either creatively or negatively, will determine the levels of ICT engagement.

### 2.5 Security and duty of care

Within some of the education and training environment, duty of care is paramount because the users of ICT systems are children. The secondary issue confronting all organisations, including education and training providers, is the prevalence of malware – viruses and spam. A third aspect of this, particularly in the social networking environment, is cyber-bullying.

Sophisticated blocking filters are used to filter access to harmful websites. Firewalls and other systems of security are installed to forestall hackers and resist viruses, and software installed to filter spam. In addition to this, policies are often introduced in some organisation to block all websites, and only permit access to those that are deemed appropriate by the organisation providing Internet access (eg education departments). Permission has to be additionally sought to open websites. However, these restrictive and centralised policies and practices can limit the agility and flexibility of teaching and learning, especially in using Web 2.0 technologies, and in the future, cloud computing, thus curtailing ITC engagement and innovation at some levels. This question is more fully examined in the SICTAS report [Web 2.0 site blocking in schools](http://www.educationau.edu.au/jahia/webdav/site/myjahiasite/shared/papers/SICTAS-nsi.pdf).

### 2.6 Demand and resources

Demand and resources are connected. The more demand on the ICT services that become integral to the performance and productivity of the organisation, the higher levels of demand, from staff and customers (students in the education and learning context).

The challenge with many of the new generation ICT technologies are that they are bandwidth hungry – eg audio and video (podcasting), in particular – in that they come via the Internet, not off local networks.

The second challenge is that the more successful the engagement with ICT in teaching and learning, the higher the levels of demand – on the network infrastructure at one level, and on the help service desk at the other. In some successful cases, this may even be an exponential increase.

The third issue is the unpredictability in estimating these volumes of demand, particularly on the network. Some organisations do not currently have the infrastructure in place to handle high demand levels. This can cause user frustration and disappointment, and can drive the sceptical users away from engaging with ICT, as it’s seen not to work.

Resources are required to service the demand – more hardware, more robust networks and more staff to person the help service centres. On the other hand, resources within an organisation are competitive and finite. The issue for the organisation is whether this is an ever-increasing demand or an organisational ‘blip’ that can be reduced by other means, such as training and mentoring.

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2.7 Case Study references to ICT challenges

Public Primary school – Appendix 5.2.7

Independent secondary school – Appendix 5.3.7

TAFE college – Appendix 5.4.7
3 Models of ICT service

Aim: To devise a dynamic, responsive ICT service model that attends to the day-to-day user demands and the ever-changing ICT environment, but at the same time, maintains standards and security.

The main interrelated features of such a model are set out below. These features are described in relation to the case studies and references are included to the case studies where applicable.

3.1 Governance

The organisational governance structure is critical. This means that the ICT management is integrated into the business organisation at the executive level. The purpose of this is to balance stability (IT management) on one hand with leadership (innovation) on the other. The ICT unit is directly accountable to the objectives of the business, and not to its own set of measures. At this executive level transformational and strategic ICT policy is developed, and ICT project implementation is monitored and evaluated. Governance decisions on ICT service implementation are best informed by the Information Technology Infrastructure Library (ITIL) Standards, and project management through Prince2 methodologies². The ICT leadership provided at this level flows through the whole organisation, and is the main stimulation for encouraging organisational engagement and ICT innovation.

Below the executive level, there is a robust committee structure involving all the stakeholder groups (ICT unit representatives, staff, teachers, students). These forums process change requests and policy, up and down the line. They can also initiate ICT actions within the constraints of the organisational policy frameworks and budgets.

3.1.1 Case study references:

Public Primary School – Appendix 5.2.1

Independent Secondary College – Appendix 5.3.6

TAFE College – Appendix 5.5.1

3.2 Culture

How the ICT unit perceives its role in relationship to the business – its customers and clients – is crucial. Is it a gatekeeper or servant?

In the service-oriented mode of operation, the service is totally user (staff, teacher, student) centred. There is an understanding that saying ‘No’ is not a solution. Instead, options are suggested, researched and when appropriate, implemented. The ethos is collaborative, working directly with other divisions such as teaching and learning directly, in forums, meetings, training, etc. There is the understanding that in education and training, help requests are invariably urgent, and delay is

² Projects IN Controlled Environments (PRINCE) is a project management method. It covers the management, control and organisation of a project. ‘PRINCE2’ refers to the second major version of this method and is a registered trademark of the Office of Government Commerce (OGC), an independent office of HM Treasury of the United Kingdom. 
http://en.wikipedia.org/wiki/PRINCE2
frustrating or embarrassing. There is a strong desire to communicate across the technical language divide.

### 3.2.1 Case study references:

Public Primary School – Appendix 5.2.6

Independent Secondary College – Appendix 5.3.6

TAFE College – Appendix 5.4.6

### 3.3 ICT staffing

ICT staff are selected on the basis of their competency and capacity to embrace change. They must have the technical competence to do their job. They must be able to work cooperatively in teams. They need ongoing professional development, (although this is sometimes an issue with the level they reach and the training that is available). They need to understand the importance of the role of governance in the organisation and that they are accountable to it. They need to be fully conversant with the ITIL standards, Prince2 methodologies and project approval processes such as the Victorian Treasury and Finance Investment Management Standards. They need a strong research capacity, to follow through on change requests that often sit outside their comfort zone, and to evaluate them openly, enthusiastically and objectively.

It appears that, in many organisations, changes in the way ICT staff work is often secured as a result of changing staff.

### 3.3.1 Case study references:

Public Primary School – Appendix 5.2.5

Independent Secondary College – Appendix 5.3.5

TAFE College – Appendix 5.4.5

### 3.4 Infrastructure

The infrastructure needs to be stable, secure, reliable and modular, to enable growth with ever-increasing levels of demand.

The demands on the infrastructure (networks and hardware) will increase as the organisation becomes more and more engaged and reliant on ICT. In some circumstances, this is best rolled out before the levels of demand hit, as it can be extremely frustrating for the user and provider if the system cannot provide the speed and volume of access required. In some cases, wireless networks have not been a solution. The networking issues underscore the need for high speed broadband systems.
3.4.1 Case study references:

Public Primary School – Appendix 5.2 introduction
Independent Secondary College – Appendix 5.3 introduction
TAFE College – pp 38-40 introduction

3.5 Software applications

Software and Internet applications are everywhere and mostly free (Open Source).

In the ICT service model, Open Source technology is critically evaluated and embraced. There are obvious advantages:

- It is plentiful. There are many contending Open Source software and Internet applications, around similar functions eg wikis, podcasting, blogs etc.
- It is free, and therefore a substantial cost saving as there are no annual licensing fees.
- No vendor ties. There is no fear of the company that developed the software going broke, or being absorbed into another company, or discontinuing the product. No one owns the software.
- It is heavily customisable and configurable, which means it can be adjusted to suit particular needs. There is open access to the source code that enables this, whereas with proprietary systems, there is not.
- The skill set is widely available and developers can go to people with basic coding skills who can work with it. There is no requirement for a licensed practitioner.
- It’s not a ‘walled garden’. The developer is not locked into its system, whereas the proprietary system does not allow integration with competitors. In fact, because they are based on an open standard, Open Source systems are easily integrated with other systems.
- There is a strong community of practice and support, where large numbers of developers are continually producing other modules, and if support is needed, there are many support forums available.

In many organisations, because the ICT unit has not allowed Open Source, users have gone outside the organisation for this access. This often conflicts with organisation policy and ICT protocols.

In the service-oriented ICT model, these technologies are researched and evaluated, and then if appropriate, integrated into the organisation’s internal system so that they can be standardised and better controlled.

3.6 Internet access

The Internet is the primary resource for information, software applications and communications technology. The ICT must provide a safe and secure environment for the user - free of malware and spam, protected from anti-social and morally degrading sites and cognisant of cyber-bullying. The user centred ICT service adopts an open policy to Internet whereby general access is totally permitted and SurfControl\(^3\) technology blocks undesirable sites.

\(^3\) http://www.websense.com/content/home.aspx
3.6.1 Case study references:

Public Primary School – Appendix 5.2.3

Independent Secondary College – Appendix 5.3.3

TAFE College – Appendix 5.4.3

3.7 Technical support/operations

Central to the ICT service is an online and phone help service desk. The size and hours of service will depend on the varying levels of demand. ITIL standards inform the help service desk operational model. Phone calls are made for immediate help requests, but the ICT unit encourages users to report through online communication where possible.

An effective triage system sits behind the help service desk, sorting calls and messages that can be dealt with immediately, from those that need referring to further expertise or are change requests. Help requests may prompt change requests when the volume of help requests cluster around a specific issue. There are published service standards that make processes transparent and manage user expectations. The online help desk ensures that help requests are recorded and enables robust reports on levels of demand, so that services can be adjusted responsively to meet demand and plans for the future are based on real data.

3.7.1 Case study references:

Public Primary School – Appendix 5.2.2

Independent Secondary College – Appendix 5.3.3

TAFE College – Appendix 5.4.3

3.8 User training/mentoring

A continuous and robust training regime is instigated for the users (staff, teachers, students). This training is aimed primarily at improving digital literacy skills, so that these can be applied across the broad range of hardware, software and Internet applications that will be part of the user’s digital armoury. It is not expected that everyone needs to learn about everything – teachers will choose the applications that are appropriate to their teaching and learning requirements. The training therefore is decentralised and highly targeted, to departments, discipline areas or even individuals.

Training for teachers is most effective when they have paid time to attend, structured within their teaching load. In some cases, it may be more effective for students to teach the teacher because their digital skills are often superior. The pace of training can be sped up and the load shared through a robust mentoring system, where those trained in specific tools are the mentors for others.

A robust training system takes the burden off the help service desk, as users become more self-reliant and confident with their digital skills. Training also underpins the rollout of any new project systems, such as the introduction of interactive whiteboards, a learning management system, a staff portal, etc.
3.8.1 Case study references:

Public Primary School – Appendix 5.2.2

Independent Secondary College – Appendix 5.3.4

TAFE College – Appendix 5.4.4

3.9 Communication

Communication with users about the organisation’s ICT systems and operation are ongoing and through various channels. ICT policies, procedures and service standards are always current and accessible. New technologies and systems implementation timelines are clearly and consistently communicated and attention is given to the transfer of knowledge that will be required to support the use of the technology. Websites, newsletters, blogs, wikis, etc are all used to communicate this information.

3.9.1 Case study references:

Independent Secondary College – Appendix 5.3.1

TAFE College – Appendix 5.4.4

3.10 ICT cost benefits and evaluation

Investment decisions in ICT are made at the highest levels of the organisation: the executive. The performance of the ICT is reviewed regularly against an agreed set of standards. At the organisational level, performance will be measured against the goals of efficiency, quality of service, flexibility, innovation and value. Staff ICT usage is measured in terms of their productivity, and teachers in terms of their teaching effectiveness.

But ultimately, the investment in ICT has to be made against the impact it has made on students’ learning.
4 Organisational ICT processes

This diagram visually represents aspects of an ICT service model that is adopted by the organisations in the case studies.

In a user-centred ICT service models, there are two channels for user interaction:

4.1 The Service Desk system

This handles the majority of help requests. These are processed through a triage system, where the immediate requests are fixed – ie computer/infrastructure failure, help with logging on, etc.

More intermediate problems, such as installation of software, use of digital recording equipment, launch of a new technology, are resolved and implemented within the policy framework, and this flows on through training and communication with the users (staff, teachers, students).

Larger change requests, such as the request to adopt a new operating system, new technology, etc. are referred across to the decision-making stream, and if acceptable, transformed into a project, with the agreement of the policy decision-makers (where it has impact on budgets or whole of organisation).

In order to lessen the demand on the Service Desk, there is an ongoing program of staff/student digital literacy program, supported by mentoring. Communication is vital, and user-friendly FAQs, blogs, wikis that assist in the knowledge transferral of information about the use of technologies and teaching/learning tools are established.
4.2 The Stakeholder forums

The forums will depend on the size of the organisation, and include teachers, staff and students (users) in the discussions around the use of technology in the organisation and classroom. In a TAFE college, this may include heads of schools with ICT staff at the appropriate level.

These forums discuss change requests.

There is some policy formulation at this level, and some implementation ability without referral to higher levels if it’s consistent with pre-existing policy and budgets. Training issues are also identified in this forum, and referred to the users training program.

Issues coming through this channel will often require research, and ICT staff will need ongoing PD. The issue will be acted upon (planned and implemented), bypassing the top level of governance if it’s within policy parameters. It will go to the high level only if there was a major change request.

Thus, many of the Help service referred issues and user change requests will be resolved at the Stakeholders forums for implementation.

Knowledge and understanding flows back from research and ongoing ICT PD to the Stakeholder forum, and upwards (depending on the scale of organisational impact) to the policy formulation forum (executive).

4.2.1 Policy/review.

The executive level determines overall policy, oversees project planning and implementation, and evaluates the technology implementation against set criteria (teaching and learning, organisational goals). The policy (executive) decisions will also flow back to the Stakeholder forums, directly responding to change requests (will it or will it not be developed).
Appendix 1: Case Study – Black Forest Primary School, SA

Black Forest Primary School, based in the western suburbs of Adelaide, celebrates its 90th year of teaching this year.

There are about 500 students attending the school, and about 32 full and part-time teachers work there.

They have two computer suites with 30 computers in each room. They have a pod of laptops for students to use in a more flexible space, wireless connected.

They currently have 7 interactive white boards; another 13 are about to be installed, and by end of year, every classroom will have one.

There are two computers in every classroom – one of these is for teacher use, which is or will be connected to the interactive white board and data projector. All in all, the ICT staff are managing 120 computers on the curriculum network, and have another 10 computers on the separate administration network. The computers all use a Windows operating system. According to the ICT staff, compared to other schools, this is lot of infrastructure for a primary school.

The school has its own web site, and a Learning Management System, Moodle that the South Australian Department of Education and Children’s Services (DECS) set up about a year ago.

There are two staff managing the school ICT system – the ICT coordinator, Alister Davies and the ICT technician, Adam Crawford, who currently works 3 days/week mainly doing maintenance and responding to teacher enquiries. Alister spends 4 days/week teaching ICT to the students in the computer suite, and one day/week dealing with ICT issues, administration, training and policy development.

The network is hardwired, although two teaching rooms do have wireless, but according to Adam, ‘we have a lot of problems with wireless. When you rely on it 100% of the time, it tends to drop out a fair bit, no matter what brand/model you tend to go for. We definitely prefer hardwired. Two classrooms have a wireless set up, but it just gives us grief. We have a small wireless cluster when the kids are using laptops, and that seems to work OK, but when connecting classroom using wireless, it’s more trouble than it’s worth’. So they are not intending to provide wireless coverage for the whole school.

The curriculum network is controlled by the ICT staff, but the administration network is operated externally by DECS, and the external connection to the Internet is via a proxy server, again controlled by the department.

5.1 Governance

Currently, the ICT staff tend to drive the ICT agenda somewhat isolated from the rest of the school, where they talk and discuss the issues together to develop an ICT vision for the school. Alister puts this isolation down to that fact that in his time at the school (it’s now his seventh term), he’s working with his fourth principal. They have just recently appointed their first long-term principal.
Alister explains: ‘We have a computing committee, but they haven’t met – probably because of all the changeovers. Last year when we met, it was me, Adam, the principal, the librarian and librarian assistant. It’s now time to start activating that committee again.’

They developed a vision plan last year when submitting for a government grant, and this has been reviewed twice since then. As Alister says, ICT planning ‘comes down to budgeting more than anything else. Everyone can see that more ICT is going to make things better, but the budgets in primary schools are small, and it’s hard to justify spending the majority of the budget on ICT.

We’ve got a fairly large budget compared to other schools, so there’s the realisation that we’ve a vital component of the school and the need to spend that money to keep things functioning. What I’ve developed is a 4 year cycle of replacement of everything that we’ve got – the two computer suites plus the networking hardware, then the rest of computers in the school - so it’s a 4 year replacement model.’

But resources are tight, and the constant demands are on the ICT staff are high.

According to Adam, ‘the main problem is trying to keep all the servers updated, the machines updated, stopping all the viruses getting in. General maintenance is not too much of a problem, but every 5 minutes someone walks into your room expecting you to do something else not necessarily classified as IT related; for example, plugging in to a TV – that’s not really part of my role – but that happens pretty well weekly. I get a lot of distractions, and you can’t say ‘No’ to the teachers in helping them out, but it eats at your time without you knowing it’.

5.2 ICT help support

Although the ICT staff would like a more ordered approach to staff help requests, such as processing them through email, this has not been possible to implement.

Adam explains, ‘Unfortunately, there’s a bit of backward thinking in this school and a lack of email communication, even though we’re trying to change it. They mostly just walk in my door or call on the phone – they generally come out of the classroom to ask. When there’s an issue, I go to it straight away, to get it out of the way – then I don’t have to think about it again’.

5.3 Internet access and duty of care

Access to the Internet is controlled by DECS. Many websites are blocked, and the school has to request DECS to unblock them if a site is not on the permissible list.

The school has no choice but to use their proxy servers and these filter everything.

However, most years 6 and 7 students have set up their own gmail accounts – and they’ve learnt a bit about cloud computing – opening shared documents, collaborating and they can do social networking on the Moodle site.

There are a lot of websites blocked for students, but the ICT staff can provide the teacher with a password/login to bypass that. As Alister explains, ‘This is much easier, otherwise they would have to come to me every time and I would have to download everything. It’s better that we allow that level of trust – a teacher only user name password and it’s so much easier for them if they want to show something on YouTube, or other similar sites’.
5.4 Teacher’s digital literacy and training

DECS currently conducts annually a survey on primary school teacher computer skills, and their results will be released soon, so the ICT staff will have a better idea of what the current level of primary school teacher’s digital literacy skills are.

According to Alister, the computer skills of the teachers at the school are not high, and they tend to rely on Alister to do the work for them when it comes to doing things electronically in the teaching context. This means Alister helps by finding and downloading appropriate software that students and teachers may need to use, distributing these on CD or installing them on the computers in the computer suite, and finding and uploading learning materials for the teachers to their LMS, Moodle.

Alister: ‘It’s interesting to observe how things happen in primary schools. The teachers work behind closed doors a lot – people tend to shut doors and work on their own in isolation, and quite often say ‘I haven’t got time to work on computers’, so the skill level of primary teachers is not overly high. This means if they want to know something, they go direct to the IT people to find out, rather than having the skills to work it out themselves.’

This reliance is reflected in the way in which Alister works directly with the teachers on class projects. Alister explains: ‘Teachers approach the librarian and myself. For example, a year 2 class is studying spiders. We will then research a lot of Internet sites and add that information, gather web links and create them in Moodle, so that when the class logs in, they have all those resources for them to work on’.

Alister’s approach when he first came to the school was to have the teacher’s come into the computer suites with him whilst he taught the students, but this did not happen due to funding issues; now they just drop the children off and leave.

However, his teaching approach has meant that the children’s digital skills are really improving, from basic computer skills to now using a range of digital technologies creatively in their learning. ‘I’ve noticed that the skill level of the kids has increased radically since I’ve been here, and the way the teachers’ skills are improving is through the kids!’

Adam makes himself available to teachers to help them with computers use at any time. One day a week after school, he’s always in his room, and different teachers come in then. They also promote various training sessions on software on a regular basis, and some teachers turn up. They do specific things with lower, middle and upper primary groups, depending on their needs.

The ICT staff have conducted a couple of whole school training days taking the teachers through Moodle. However, most teachers do not have the digital skills to start using it, but they are hopeful that once the kids start using it, this will flow on to the teachers. They also envisage that once they get all the interactive whiteboards in every room, there will be a ‘huge increase’ in the use of Moodle. Currently, one or two teachers are using it, and they hope by this time next year, there will be more.

The school set up four white interactive boards initially – at least one in each of the sectionals. The teachers in those four classrooms spent most of last year familiarising themselves with it. This year, the teachers using the whiteboards ran a full school training day, presented what they had learned, talked about the difficulties and the benefits of using white boards in the classroom.

Because the school is buying the whiteboards from the same company, they provide free training hours. They’ve just completed a second lot of training – with 6 teachers who had the whiteboards, plus a few others interested. In next few weeks, after putting another 13 in, there will be another 9
hours training. It’s envisaged towards the end of this year there will be another full day whole of school training on it.

So in the case of the training for the whiteboards, this is occurring more through a teacher mentoring approach.

Alister: ‘Yes, that’s exactly what’s happening. The teacher in upper primary level is taking on role of training other teachers in that section. I’ve taken a bit of a back seat in this one. It’s better for these people to take that role on – and that was part of the agreement when they had the whiteboards.

The ones that have the whiteboards are very helpful in that. We’re only used to help on the technical side, to make them function. We just upgraded all the software, so we’re helping also with that.’

5.5 ITC staff PD

Keeping up with what’s happening in the world of ICT is a constant issue, so how is this attended to?

Adam: ‘IT is in my blood. I go home after work and still sit at a computer, whether working or not. My housemates are also ‘geeks’ – they’re both in IT. Our weekends consist of IT related projects as well, so the three of us are always keeping up to date. I’m also on different news and forum sites, and occasionally go to formal training’.

Alister: ‘I’ve got networks that I work with. I’ve got friends in similar positions in schools, so we share knowledge quite a lot: we share software that we’ve discovered and we train each other in it. I’m on a number of online forums and get regular newsletters to keep up to date. I have a problem with formal training because it’s generally at a lot at a lower level than what I do myself. I went to a session this year looking at mobile phones to make videos: it wasn’t just the skills - it was tied into values-based education. However, generally the training offered is not attractive at all – it’s mostly at a beginner level. There’s not much offered to someone who got a reasonable level’.

5.6 ICT culture and mode of operation

The mode of ICT operation is a student-centred service. In many ways, they have by-passed the teacher (other than to provide daily technical support) and now concentrate on ensuring that the students are actively engaged in ICT.

Alister explains the logic behind this approach. ‘In any school you go into teachers are counting down to retirement. Why bother? Change is always a huge factor with educators. I’ve had change all my life in employment, so I’m used to it and embrace change. ICT is about embracing change, so you’re always going to find a reasonable percentage of educators who are distant to it, and are challenged by the fact that the kids know more than them. They haven’t yet accepted that it’s OK for kids to know more than them. But they have the wisdom to handle the knowledge that the kids have acquired.’

In other words, the innovative learning comes from the teacher’s long time experience of pedagogy intersecting with the student’s technical knowledge. As a result, Alister has witnessed teachers learning ICT from the children.

The other principle in this student-centred ICT approach is the consideration that in everything that the student can do at school, they should be able to also do from home. This is why the Learning Management System, Moodle, is so important: so students can access all the school resources from there, and it also applies to the selection and distribution of software for the students.
Alister: ‘We’ve got a very creative program but it’s connected to home – whatever the students do at school, if they’ve got a computer at home, they can keep on doing it. It’s not an elite program that you can only do at school. So it’s very relevant to what kids learn.

My philosophy on software is that whatever kids can do at school, they should be able to go home and replicate it. Therefore, we’re not using fancy materials. For example, in a recent video competition, we are using digital cameras rather than video cameras, because every family will have a digital camera that can take video, or they can use their mobile phones. We use Windows Movie Maker, which is free on PC. All the graphics programs are free off the Internet, for example, our claymation software, and even the audio editing software. We’ve got it all on CDs so that kids can take it home.

We have a number of kids who come and go over the holidays, so we want them to start accessing Moodle if they want to. So when teachers give handouts, I scan them in now and put them on the Moodle site so the students always have access to them at home as well as school. I can put up some of the finished work that kids do on the Moodle site so kids can show parents their work at home.’

Alister and Adam form a complementary team in how their ICT service works. Alister is aware of ICT departments that are themselves resistant to change, and therefore reluctant to accommodate change and innovation from others.

‘That’s true, and something I’ve experienced in the past. It can stifle creativity - we are very aware of that. We only put restrictions on things that are necessary. A lot of times, those restrictions have been put on in the past because of a fear that someone may know more than you. One thing about Adam and I, we think completely differently. It’s good having different views and approaches and not restricting creativity and difference. That’s the balance within our team.’

And Adam confirms this: ‘Every week Alister is all excited about some new program that does this or that, and I sort of say, ‘Yes, but it will do this? And maybe it won’t do that.’ I’m a little bit negative in that regard, but it works well with each other; there’s a good balance’.

5.7 ICT challenges

There are many challenges for ICT at Black Forest Primary School. The budget is small, and therefore the progress on rolling out new systems is slow, and some things just can’t be done because there is not the money to do it. However, creative ways, including grants, licensing hardware and bulk purchasing, are found to help their cause.

But over and above the resource issue, the ICT team identified security, risk management, frustration with a reliance on a centralised system, lack of local control and keeping up with demand as their biggest challenges.

5.7.1 Security of the curriculum network

The security of the curriculum network that links all the 120 or so computer is a constant issue, particularly with malware. Adam: ‘Viruses is the main thing on my mind, as we had an outbreak a few weeks ago. The biggest fear I have is of the server completely dying and having to start from scratch again. I never want to have to deal with this in my life. Most viruses come from USB drives. We use heavy-duty virus protectors on the server, and a lot gets deleted off their flash drives if it’s alerted’.
To mitigate the security risk, the teachers can run programs (the students can’t) but the teachers don’t have permission to install programs on the computers.

### 5.7.2 Risk

The constant issue for ICT is purchasing and installing systems that may be redundant in a few years, or a better system is launched just after the one purchased has been installed. Adam says, ‘You have to close your eyes a little bit. You know that if you don’t get it now, you’ll never get it. If you wait for next year’s model, you’re always going to want the next one, because it does better things. But you would never buy anything on that principle’.

The installation of interactive whiteboards is funded by a Federal Government grant; otherwise, Alister says, the school could not have afforded them. However, there are still risks in this, as Alister explains: ‘The financial risk of the whiteboard is that we will have 20 whiteboards in the school in about 3 years, then we’ll need a replacement bulb, and that will be $300- $500 each. That is an ongoing cost. Before we put them in, I was a bit resistant to the idea because they might be an intermediary technology. Maybe in 5 years we won’t be using them – maybe it will be touchscreen plasmas instead – so I wonder if the longevity of the technology is there.’

In other ways, the risk is mitigated by having the costs shared or defrayed. For instance, the State Government enabled them to buy computers, so long as certain conditions were met, at a very cheap rate to lease over 3 or 4 years, then they own them. It works out to be less than $800/computer. For them it’s a way of reducing risk – it cost the same to buy outright 6 new computers as to have 30 leased.

Alister says this means if this is an ongoing thing with the department, they can replace the servers every fourth year, and it makes it more financially viable.

They have a Microsoft software licensing agreement which is negotiated by DECS, at a very cheap price (around $6.00/student), but it doesn’t cover everything. They need to purchase other proprietary software, such as KidPix, but the school has to arrange this.

### 5.7.3 Slowness of access to the Internet

One of the biggest frustrations the ICT staff have is with Internet connectivity.

Adam: ‘There are certain times during the day that getting on the Internet is almost impossible, because the bandwidth is not available. That is right across the whole system. It’s not our bandwidth – we’ve got a 2 megabit link – even on full load we have good latency. The problem is that all our traffic has to go through DECS’s proxy servers, and they are obviously overloaded. Same with their email servers – all extremely overloaded no matter how many upgrades they seem to do, nothing seems to make it better’.

The slowness of the connection affects many things. During the Olympics last year, when the students were studying this and everybody was accessing the Internet to find out what was happening in China, they could never get access. According to Alister, they ‘never know whether it’s going to work or not’.

The speed also affects their email. Again, according to Alister, ‘someone can send me an email, and won’t get it for half a day to a day’.

Adam suggests that the department has ‘always under-estimated the use and demand on the Internet, so their infrastructure has never been able to cope with the demand’.
He would prefer a more centralised system: ‘I’ve often thought it may be better to have proxy servers to be hosted at the actual school, but controlled by DECS remotely, as they do with our administration server – we would then have a degree of control over it. Perhaps we could have a decentralised set up like that, and therefore get rid of any hardcore server issues’.

The connection to Moodle, the Learning Management System, is reasonable because the server is run externally to DECS, and therefore seems to work quite well.

According to Alister, the speed issue will have impact in the future if it is not resolved, for such things as cloud computing, where the students use the Internet for access to a variety of programs, such as the ones Google now provides – sharing documents, etc. Alister believes that this is the direction computing is heading, and education will need to follow.

5.7.4 Lack of control

In many respects, the ICT staff at Black Forest Primary School have limited control over what they can do with ICT. DECS controls the Internet connection, Moodle and the administrative network; the school manages the computer suites and the internal ‘curriculum’ network.

The first problem is that it means that the two networks can’t speak to each other. As Alister explains, ‘Sometimes as a teacher, you need to use the admin system, but you can’t get there – you have to go to another part of the school and log on, and then you have no access to the curriculum network’.

In regards to the administrative network, the school is supposed not to touch it. This means that if there is a problem, they need to call the DECS help centre. Adam says, ‘this means being on hold for 40 minutes waiting for something that would take 5 seconds for me to fix.’

According to the Black Forest ICT staff, the technology that’s provided by the DECS system is sometimes out-of-date, such as the installed browser, IE 6, when IE 8 is the current standard; using Office 97 to operate the administrative network, and some software, such as a mailserver for the distribution of electronic newsletters is not available.

The ICT staff have had to find ways around this centralised control. Prior to the department setting up their own Moodle, Alister had set one up independently on an external server in the US. However, because of DECS’s site blocking policy, they then had to get permission to have this unblocked.

They have set up their own mail server so that they can send this to the school community. This operates off an external server. However, again they continually hit DECS’s blocking policy, and every time they login to make a change to the service, they get blocked again.

For their 90th school anniversary, they have again set up a dynamic website externally.

There are many other services that they would like to set up for the school, such as blogging and wikis, but again, they can’t install these things on the DECS server, so would need to operate these externally.

5.7.5 Keeping up with demand

As a consequence of their ICT push, there’s been an increase in the level of demand.

When Alister came in 18 months ago, there was only one computer suite with 19 computers for the whole school. Students had to double up. There was one computer in each classroom and 6 in the library. The first thing Alister did was increase the number of computers in the computer suite to 30,
then build another suite, plus an extra computer in each room, and then roll out of the interactive white boards. So the expansion has been fast and extensive.

But it has meant more work and a larger load on the infrastructure. The person before Adam did the job only 1 day/week; Adam began 15 hours/week and is now doing 21.5 hours. He says, it’s rare that he gets to do 21.5 hours, and the amount of work he does after 11 o’clock at night at home is mammoth.

The same pressure is on the Infrastructure. Adam explains, ‘there’s a lot of video work being done which seems to slow things down, and data storage on the server starting to become an issue. We need to actively remove things, and at the end of the year, we just wipe them. We’re trying to ignore it a bit at the moment because we don’t have the budget to put in more server storage. With the new building, we’re hoping for an upgrade’.

5.8 ICT impact on teaching and learning

Alister believes that with the technical infrastructure and Moodle in place, they can now move to another level in the use of ICT in teaching and learning, and this is most apparent in the students.

Alister: ‘We’re offering an above standard service because the ICT is now embedded across the school; there’s a good computer ratio. I’m not teaching the basics to the kids anymore – they know the basics. I now teach the creative and exploratory side of ICT. The feedback is very positive, both from the kids and the parents. They like what they are doing and learning, so they are going home and teaching the parents how to do things’.

If a teacher approaches for something unique or radical, Alister will support them in that, and help them develop the resources and make sure everything is up and running. But at the moment, he feels the person who is doing the most in technology is himself.

‘We’re working towards the demand. There’s been such an increase in ICT, but it’s only becoming apparent. I look at what I was teaching last year and what I’m teaching now. At the beginning of last year, I focused on the kids being able to use word processors and PowerPoint properly. Now we’ve done a lot of video, a lot of creative stuff with graphics - the focus with kids is going to a higher level.

Now teachers will start to realise that they can do a lot of innovative practice.’
6 Appendix 2: Case study – Saint Ignatius' College, Riverview, NSW

Saint Ignatius' College, Riverview, is a Catholic school for day boys and boarders from Years 5-12. It was established by the Jesuits at Lane Cove in Sydney in 1880 and is part of the international network of Jesuit schools begun in Messina, Sicily in 1548.

The campus covers over 100 acres, and is divided into three separate areas for the junior school (years 5 and 6), middle school (7 and 8) and senior school (9-12). The school has about 1500 students and 180 or so staff.

Because of the space and the fact that some students and staff live on site, it means a very large network needs to be supported.

The Centre of Information Technology is a department with 10 staff. Each has a specialised role. The team consists of a Director of ICT and three IT managers who reflect the three pillars of the business:

- a network manager and with him, a network engineer who maintains the Novell network;
- a knowledge services manager responsible for all knowledge/IT information systems and e-learning, and with him, a database administrator (SMS) and a full time training officer (with a strong focus on ongoing ICT PD for all staff);
- A client services manager, with two technical support operators (who do the work). They look after all the general enquiries such as a projector not working, computer not starting, need a piece of software installed, maintaining all the users, computer maintenance, rolling out new machines, etc.

The tenth person in the team is the help desk assistant who persons the front desk and answers the help desk phone.

Every full time staff member has a computer, predominantly laptop. There is currently about 20% wireless network coverage, and within 18 months, they aim to have 100% coverage. There are additional desktops in departments for part-time and casual staff to share.

Students don’t have assigned computers. The computers are predominantly lab based. There is one Mac-based computer lab in junior school, another Mac lab in the middle school and four labs for the senior school, with PC operating systems. Each lab is a full class set with teacher machine, data projector and interactive white board.

There is a strong belief in dual operating systems. With the junior and middle schools focused more on creative tasks, it was considered that Macs were best for that. These were only installed 18 months ago. Every Mac boots up by default as a PC (using Bootcamp) so not to alienate staff who are used to the PC environment, but students can change this depending on what they need it for. In the senior school, where its CAD design, business studies, the PC is currently used.

The staff computers are all PCs, but there is a high demand now for Macs.

For redundancy reasons, they have two server rooms. The entire school works on the one Novell network, which is seen as a real advantage as teachers can easily log in to student machines to...
check their work, and into their own folders wherever they are in the school, including the computer labs.

6.1 Governance

There are three main forums in which the opportunity for ICT change requests can be made and processed: the governing committee, the executive committee and the heads of faculties committee.

The director of ICT, the director of business and headmaster meet every week. They discuss the high level issues such projects, funding, directions they want to take, and policy – where major changes will impact on multiple groups. This could be labs, Macs, laptops, switches, wireless or changes in service. This meeting also ensures everyone is happy with the way the money is being allocated and spent.

The executive committee includes the ICT director, the directors of the three schools, formation and others. At this meeting, they talk about things that they would like to achieve, and things discussed here may get taken to a higher level if it needs extra funding. ICT is not the only issue on their agenda.

Below that is the heads of faculty meetings: English, Maths, Science, etc, where general school teaching issues are raised, including ICT.

However, not all change requests come through this process. Again, it depends on the nature of the request. For example, a request to block or unblock a website is not done by the ICT department. This will be a decision that goes through the three committees to discuss. However, at other times, they will come straight to the ICT department. In this case, the manager works directly with the staff person making the request, to see whether the idea is a good one, and if so, he can research it further and implement it, so long as it fits within the general policy framework.

Julian Ridden, the ICT services manager, explains: 'My role is to help out. I have knowledge of the policy – those policies set out the basic parameters. If I see a flaw in those policies, as service manager I can escalate it or if it fits in the policy, I can work on it at that point, without going through a bureaucratic chain of command. Major things, which have impact on whole school, eg blocking or unblocking a site, have the chain of command. But if the teacher wants to use ning, or Second Life, then they are encouraged to come directly to me.'

Riverview is a well-resourced school. The budget for IT is based on the numbers of students attending the school. The IT director meets with stakeholders around the school to find out what they want to do. ICT then design the budget and submit it to the principal for approval. This is pretty much guaranteed if the ICT department stays within the guidelines of expenditure.

Julian laughs when asked whether the school has sufficient resources to do what is necessary. ‘Is the budget ever sufficient? Any ICT manager will always answer and say, ‘we want more’. The reality is our budget is sufficient. Yes, I could do with more, but for what we want to do, we have enough’.

6.2 ICT help support

The processing of help requests is primarily conducted through an online Help desk system. The school ICT department has adopted ITIL standards to conduct this service. They use a proprietary system called Web Help Desk [http://www.webhelpdesk.com/]. They looked for an Open Source alternative, but couldn’t find anything mature enough that met their requirements. The help service is
accessed via a login through the staff intranet, where they can also access news, policy documents, day release forms, make room bookings, etc.

The Web Help Desk is based on a ‘ticket’ system that identifies every unique request, and these tickets are allocated to appropriate staff and set anticipated response timelines. The system also has an asset register, which allows the ICT staff to track which computers and equipment are having the most problems.

The ICT department would prefer that staff use this system to put in all their help requests. As Julian explains, this is ‘not to make their lives more difficult, but it keeps staff in IT on task. Everything in the system is transparent, from the time a technician has opened the ticket. The staff can see if it’s in progress, if there’s an action, a decline or an acceptance, everything is put in the system. Someone can say, ‘I put this request in and haven’t had an answer’. You can always go in and check.’

The IT has an office on the campus, centrally located where staff can borrow equipment. The helpdesk assistance deals with these enquiries, as well as answering the phone. Depending on the nature of the request, a ticket is created in the Help system, or a person dispatched immediately to deal with the problem if it’s urgent.

‘Our primary business is education, so we make sure our processes revolve around that requirement. If someone has gone into a classroom and can’t do what they need to do, or the lab is down, they are not required to put in a ticket and wait a day or two days for us to respond. We have the phone based system for urgent requests that need to be fixed now.’

Currently, about 85-90% jobs come through the online Help service and about 10% are with teachers come to the IT office, or call up.

The volume of requests is considerable. For example, in the third week in May, there were 250 requests. On the Monday of that week, there were 32 requests. There is a wide variety of request: software to be installed, problems with phone line, an update for the website, the projector not bright enough, the printer is jammed, help with a new type of report in the SMS, and so on.

The turn around on request depends on the nature of the request. On average, it’s a one-day turn around. However, it may take two weeks if it’s a major problem such as a machine that has to be sent out externally to be fixed. If it’s a project, then it may take months.

Some help requests may be designated as change requests, and these are then processed through the committee system, rather than through the Help desk.

### 6.3 Internet access and duty of care

So how does the ICT department deal with the teachers and students wanting to use the Internet and web 2.0 technologies? And how is duty of care managed?

They have a principle of integrating the technologies, where possible, into their own system.

Julian explains: ‘We do not use external systems for student work. This is due to pastoral care issues. We’re always telling students to be careful about what they are putting on the web. Who actually owns the content on these external systems? What about advertising? What about third part people outside the school making contact through those? It can be very dangerous for us to be recommending and using any of those external systems.'
If the teacher really wants to do this, I find a way of doing it internally. We actually have the equivalent of the ning service at Riverview. We have blogging at Riverview. We have instant messaging services at Riverview. We have select videos online at Riverview. So rather than saying these are evil tools, so don’t use them, our focus is on enabling the teacher. We can then have all those new web-based systems available to the kids at home, but the major difference being that there’s a login required; we can still facilitate the same tasks, but in a way that is now secure.’

In Julian’s view, it’s Open Source technology, particularly their adoption of Moodle that has made application of this principle possible. The use of podcasting is an example of this.

‘Staff came to me wanting to do podcasting. They wanted to use external systems, be it iTunes or other podcasting sites. My response was, I’d prefer not to use them, so give me a second and I will find you something else. This is where Open Source has become our friend. The great thing with Moodle is that it is modular, which means that you can plug in extra functionality without developing extra code.

The Moodle community is used by hundreds of thousands of schools around the world. Many people have developed extra bits of code, and a podcasting module was available for Moodle. Here we have an e-learning system teachers already know how to use, so within a week we have podcasting up and running in Moodle. I just went to the Moodle community, said what I wanted to do, and someone else said ‘I’ve already done that – here’s the code’, and I plugged it in. It was no cost other than time spent to do a bit of research and to plug it in.’

The ICT department imposes no blocks on a teacher accessing external websites and repositories, other than using filters to block pornography and spam. The issue though is with blocking sites for students.

Again, the general principle is that websites are not blocked unless someone requests or suggests a block. They of course have a whole set of tools - proxy servers, spam and filter servers - that pick up spam and pornography, etc., but, a teacher may find a site that is inappropriate for whatever reason, and it can be blocked very quickly. As Julian says, ‘I’ve got the resources to do it all locally’.

He goes on to say, ‘On our network, if a new YouTube started up, then by default, it would not be blocked. There would need to be a request to have it blocked.

At Riverview, the fun part is getting something unblocked. For the last two months, we’ve been talking about unblocking YouTube for students. Many teachers want it unblocked, but because it has wide impact on the school, we don’t make the decision. The decision goes to heads of faculty, then right to the top – the principal and directors.’

### 6.4 Teacher’s digital literacy and training

The teachers’ digital literacy skills at Riverview are variable. It’s an average school where the average teacher age is around 50. Julian estimates that it’s typically 10% early adopters who love technology, 10-15% who just won’t change (adopt technology) and everyone in the middle who is willing to learn and try it.

That’s where they believe their investment in their teacher PD program has been so important.

The PD program has been going for about 5 years. Every single teacher at the college has an allocated PD time in their timetable. It’s not outside time, they don’t have to stay back after school, it's
not an additional class load. Just like a class, they are required to attend - it’s considered as part of their teaching load.

The PD session runs on a fortnightly cycle and is approximately 55 minutes long.

The PD is held in a custom built room on the campus. It’s always filled with interesting pieces of technology, and includes a smart board, round tables for group discussion, lab style tables, computers and wireless so teachers can bring their own laptops and experiment with new technologies, and a digital overhead video camera that can record the session.

Julian explains: ‘How we use this session is wide and varied. Sometimes we are responding to a required need – a new report system, we’ve just launched Moodle -then we can use this PD as we know this is what the staff will need. At other times, the PD officer talks regularly with heads of faculty, and so quite often makes each session targeted. The PD sessions are with groups of 6-8 teachers, and they are normally faculty-based. We would see one half of the faculty one day, the second half the next. Because it is done in faculty groups, the training can be targeted.’

They also have an Advanced Teacher Program (ATP) which is a response to the NSW Government requirements for teachers who want to move up the scale of the teaching profession.

Finally, there is the ICT program in which all staff are required to attend 4 days of non-term PD. Sometimes, this might be an ICT session during the holidays, which could be delivered by the Education Department, or it could involve a certain product. It may not always be technical – it could be a skills management course or new education course. This program is facilitated by the HR department, and can include external courses, or sometimes trainers are brought on site.

Julian comments on the comprehensiveness of their PD programs:

‘Riverview has a very strong focus on ongoing learning. This is in large part to do with the Jesuit influence’.

Many schools do not have inbuilt PD. Many have a training officer that organises replacement teaching for external PD, or it’s an after hours PD. This school has invested the time and money to offer PD as part of the teacher’s load. So I know once every two weeks we will see the person. We’ve also invested in someone whose sole job is IT PD.

I’m not a supporter of centralised model for PD. Every school has different requirements – especially in ICT. They may have rolled out the technology, but how the schools use it may be very different. One school may have a heavy focus on e-learning systems; another may be on video with a multimedia presence. A centralised model can only work through generalisation, and with generalisation, you end up with a shallow style of PD.

The advantage for Riverview is that it’s de-centralised. I can target the training exactly for the teachers here, which means I can be responsive to them. I can be pre-emptive, as I know the directions my school is taking. While I understand the need for centralised models, I think the reality, especially with PD, it is different because you have to make generalisations.’

6.5 ITC staff PD

So how does the ICT department keep up with all the changes in technologies, and systems, and new ways of doing things?
Julian says that this has to do with the culture of the department and the people who are working in it. ‘Each of us has that passion for ongoing development. Riverview in this regard is very unique. The director of IT is even more looking for new things than I am. Our environment does not see change as a negative.

For us it’s trying to find the right people. My role is to find all these tools, etc that meet the demand. I have a personal passion. I know Open Source, I work as a Mahara and Moodle developer, I work with Joomla, I go to symposiums, conferences I have a passion for this. Each of the other staff has their own passion. The network engineer loves networking technology; he’s always looking at new things, such as blade computing.’

6.6 ICT culture and mode of operation

Julian believes that it is the ICT culture and the approach that they have adopted that makes them so successful. And this approach is often contrary to how an IT department acts. He characterises their approach as a ‘support model’.

‘When I came to Riverview two and a half years ago the culture was distinctly different to what we see now. There was a different Head of CIT (as it was known then) and a different team supporting him. He was more network than client focused, which lead to a perception of inflexibility and unresponsiveness to staff requests, while the current Director of ICT is extremely user focused. With this shift of balance come new policies and a shift in how resources are allocated. Over about 6 months the Head and many of the team changed allowing for this new balance to be obtained.

Here at Riverview we don’t dictate how our technology should operate; quite the opposite. We should be here to support what teachers want to do. So if they want to do a large multimedia project, which requires a lot of storage, our role is to make sure we can provide that. The same thing with the Macs: a number of staff wanted them. Our response has not been ‘No’, but how can we make that work?

Typically for ICT, change is seen as a negative. It’s quite the opposite here at Riverview. We can’t keep up with the requests for change from staff. ‘

So what sustains this new supportive and user focussed culture? For Julian it’s clear.

‘The headmaster. Our headmaster is very open to new ideas. He’s analytical, he has his own ideas, but we can take new ideas to him. That attitude at the top has made it so much easier for my director and me. We are not being held back, we are not being told this is how things should be. He shapes policy in certain ways, but he’s very open. He was at the Mac educators’ conference in Hong Kong; he loves to absorb new ideas. So culture starts there!

Then the director of IT came from a teaching background – Maths. The teacher background alone means that his focus has shifted – he has a very strong IT head - but his background is from education. He’s keen to embrace new ideas, and to be more teacher-focussed. Then as staff changed due to normal turnover, he hired people who match his style and what the school wants to do. You would not hire staff who want a closed environment when you want it to be open. He managed to fill our department with people of different style.’

6.7 ICT challenges

There are a number of challenges that confront the Riverview ICT department. There is quite a lot of pressure on network traffic and storage is certainly an issue.
Their e-learning system, which is Moodle, currently has 700 gig capacity. Having 1500 students all storing their homework, video files, audio files, teachers storing their resources, storing the entire Learning Federation learning objects all certainly puts a load on the server.

However, according to Julian, 'the cheapest thing in network architecture is the storage. Adding another drive is a pittance when compared to the other costs in the network infrastructure as we continue to grow, we have lots of policies in place, such as having staff manage the size of their email inboxes, students having limits on the size of their drives. We use these kinds of policies to keep a check on things, but if a staff member says we need more space, it is our role to find a way to do this.

The thing about ICT is that it’s always evolving new processes and new solutions. If you don’t continue to learn things, you stagnate. At the same time, you need to think ahead. When the SAN (Storage Area Network) was deployed, it had double the capacity that was required at the time, which means it has not run out of space yet. The same approach was taken with the network. We installed a gigabit speed network, right down to the computer in some cases, with high speed managed CISCO switches and fibre running over the campus to enable the speeds. So our aim is to always make sure we exceed demand.

For Julian, the most difficult part is managing expectations.

'We’ve said so often, ‘yes we can do it’ that the expectation is that IT will always have an answer. The amount of support we offer has also hindered us: it’s a double- edged sword. We’ve got so many staff who can’t get the projector to work with their computer, so they always call us, and we come down. The expectation can be that we do too little – not enough change, not fast enough - or do too much, too much change.

They try to resolve this conundrum through communication.

‘Our staff, including the director, are all great communicators. Our way of working is that the more we talk, the more transparent things are, and the easier we can manage expectations. We don’t always give the answer that they want. We never will always give the answer that they want. But we need to explain why, rather than give just a ‘No’. We say, ‘we can’t do that, but how about option B? We’ll work with you, we’ll support you to find an alternative’.

The new culture is along that line. If a teacher feels supported and can ask questions, then that has been the biggest change. and it’s spectacular. Here, teachers still ask. I’ve been in situations where people have given up asking.’

6.8 ICT impact on teaching and learning

The impact of ICT on teaching and learning at Riverview according to Julian is profound. Julian puts it this way.

‘The change is incredible. We have students online on every hour, of every day, of every month and every year. There are students using Moodle on Xmas morning. The kids use it because the teachers are. - We have a 75-80% use rate, with teachers putting resources online. Due to the support – they know they can do it. They see the engagement and response from the students, so that has been huge.

When I came, we were using an old Lotus Notes system, which was awful to use, so no one was using it. There was no online assessment or online activities; just to access class files. It was very
poorly used. Now there is a huge emergence of excitement. The acceptance has come primarily from the PD system that we use to support our approach.
7 Appendix 3: Case study – Chisholm Institute of TAFE, Victoria

In 1998 all the TAFE colleges located in SE Melbourne were amalgamated into Chisholm Institute of TAFE.

There are six campuses spread over a wide region based in Frankston, Dandenong, Berwick, Cranbourne, Bass Coast and Rosebud.

There are 791 sessional teaching staff engaged by Chisholm and 680 ongoing/contract staff. Casuals represent more than 50% of the teaching staff.

Chisholm has approximately 3,000 PCs running Windows XP and 150 Macs. Around 10% of these are notebooks. About 2/3 of these are accessed by students and 1/3 by staff. We have around 120 servers, 12 TB of storage and 6500 network points and Wifi across all campuses.

They are responsible for development and maintenance of institute website, the student learning portal, MyChisholm, covering learning, admin and social functions. MyLearning is a sub-section of the portal dedicated to e-learning. The student portal is built using the proprietary systems MS Sharepoint.

A landline links the campuses, supplemented by a wireless system.

The Wi-Fi service offers the ability to connect personal and Institute mobile devices to the Internet without cables in all Institute buildings and across all six campuses.

The Wi-Fi service has been designed to provide access to the Internet and web based applications and is not a replacement for the wired infrastructure.

There are a total of 24.6 staff working in IT Services. The division is broken down into 4 services teams set up around as specific domain knowledge headed by a team leader:

- IT Infrastructure, 5 staff
- Client Services, 9 staff
- Information Systems, 7 staff
- IT Procurement, 2 staff

The other staff in ITS services is the ITS Manager – the team leaders of each service team are directly responsible to him - and an administration assistant (0.6).

There is also another division within Technology & Learning Information Services (TLIS) - E-Learning Services – which is staffed by 4 Senior E-Learning Consultants.

Chris van der Weyden is the CIO and Director, of Technology & Learning Information Services (TLIS) and has a full time Executive Assistant working with him.

The diagram below (provided by Chris van der Weyden) shows the internal IT Services structure in 2009.
7.1 Governance

Chisholm is the only TAFE that has their senior IT person sitting on the executive table, responsible directly to the CEO. No other TAFE in Victoria has that model.

The Chisholm governance organisational structure is shown in the illustration below (provided by Chris van der Weyden).
The Chisholm Board is ultimately accountable for corporate governance of IT at Chisholm. The Chisholm Directors Group is the executive IT governance committee for Chisholm with executive representation from each SBU, and the CIO sits on this executive group and reports to the CEO.

For Chris van der Weyden, the CIO and Director, of Technology & Learning Information Services (TLIS), this is a most vital component to the success of an ICT department’s operations. ‘If you’re going to make one change within an organisation and you value IT as a key enabler for business future plans, then you would create an executive level position, which you call a CIO, and make that person accountable for the performance of IT. Everything else flows from that one decision’.

According to Chris, it means that he can ‘have a conversation with the other executive directors as an equal, meeting three hours every fortnight with the whole group. They are able to eyeball me within a peer environment – and I can communicate my plans within that group. Before I started, they didn’t have IT as one of the underpinning aims for the organisation. It was not on the institutional plan because there was no trust that IT could do it. Now it’s become one of the six enabling plans in the Chisholm strategy’.

There is also structured within the Chisholm governance system a clear process for ICT change requests to be made, and for policy and strategic plans to be communicated.

Every delivery area, such as Hospitality and Building Services (there are eight delivery areas) has a relationship coordinator. Inside TLIS, the team leaders are each responsible for two delivery areas. If a request for a new service comes from a delivery area, that request goes to the relationship coordinator, and they interview the person making the proposal. Chris says this is a ‘discovery session. We say, ‘Do we already offer something like this already that you’re not aware of? What would it cost, do we want it, and so on?’

That request then comes back to the team leader’s manager in TLIS. They discuss it again, and they might seek more expertise from, for example, the group that would be responsible for commissioning the service, E-learning Services. A decision whether that service is appropriate or not is made. If it is appropriate, then they would set about project managing it or put it in the TLIS project plan for the commissioning of the new service.

This process also leverages the IT committee structure, of which there is one in all delivery areas. This committee is chaired by the executive director of the delivery area, with membership drawn from senior staff of the individual teaching/delivery area. This committee includes other people in that centre with specialist IT skills and also includes the relationship coordinator from E-learning Services and the relationship coordinator from IT Services.

According to Chris, ‘this is where the ideas percolate from, responding to the IT strategy and the e-learning plan’.

He goes on to say: ‘From this dynamic leadership, the ideas and proposals are formalised through the Investment Management Standards (IMS) framework - qualifying the problem, making sure we’ve got benefits declared, and identifying the solution. Then this goes to the Chisholm governance group - the executive - that has responsibility for setting priorities. Once evaluated, it is implemented using the Prince2 project management method. Once it’s delivered, it gets handed to operations where it gets managed by the service management standard, ITIL. The performance is monitored against service standards. Are we performing, are the service standards appropriate?’

[The Information Technology Infrastructure Library (ITIL) is a set of concepts and policies for managing information technology infrastructure, development and operations. The Office of Commerce in UK publishes ITIL and it is now in its 3rd version since it was first developed in the]
1970s. It has become a world standard for 80% of IT organisations that use it to help how they organise their IT services.

The Investment Management Standards (IMS) framework was formulated by the Victorian Government’s Treasury and Finance Department – see more below.

### 7.2 ICT help support


The system is capable of handling both voice mail and email.

‘This is the eyes and ears of the IT service’, says Chris.

At the first level it is a triage system, to see if they can get a resolution while someone is still on the phone. The phone call is an emergency: ‘I’m bleeding, so need to stop the bleeding. I’d like to move from this room to that room, that kind of thing’.

They are gradually trying to shift the help requests away from telephone calls to online/email, but need to give confidence that it will be promptly deal with if help requests are placed this way. According to Chris, there can never be 100% online requests because there will always be emergency calls that have to be dealt with immediately, via the phone.

If the service desk can’t solve the problem, they will try to find a work around, and hand the problem to someone offline, and then go on to the next call.

The system is set up on the ITIL standards.

Says Chris, ‘Twelve months ago, the model was that you went through your favourite technician, and asked a favour from him. That’s how things got done. Now we’ve moved to the point only a few people do that. The technician is now instructed to say that ‘this time I will do it, but I’m breaking the rules – I’ll do it this time – but you need next time to use the service desk’. It’s not a hard and fast rule because you can never dismiss a call and say I’m not going to help’.

Chisholm would like to run the service for longer hours, but this is a question of resources and Chisholm doesn’t do a lot of after hours delivery. They could also use IP technology to allow staff to login at home using a VPN client – so when someone rings the service desk, it rings this person’s home. They’re currently looking in to at that, to offer an extended service.

### 7.3 Internet access and duty of care

TLIS have adopted an open and flexible approach in using the whole range of Open Source and Web 2.0 tools. However, their approach is to integrate the services as much as possible into their own system, rather than have the teaching staff using technologies they find themselves. Once a new technology is adopted, then E-learning Services is responsible for ensuring the staff are trained on that system.

Chris explains: ‘There’s a whole range of Web 2.0 tools out there, and we’ve said, ‘if you want a wiki, this is the wiki we use, this is how we do wikis at Chisholm’. In other words, we’ve tried to consolidate
Web 2.0 tools around the ones that have been explored by the domain expert – E-learning Services. It then gets published on our public web site, *MyChisholm*. 

According to Chris, the innovators had previously being going out to get the new products themselves, but the new effort is to standardise, and then consolidate them. This, he believes, produces flexibility ‘because you’re not wasting effort by supporting a range of products, you’re not being constantly hit in the face by having products that you’re not aware of. People tend to find their own solution if you don’t give them one. That’s why people were going off and doing their own thing, because there was no easy way for them to achieve their objective. The IT group used to see themselves as the gatekeeper of technology, ‘we’re the experts in technology around here’. This approach has now radically changed.’

Web filtering is provided as a service on the Chisholm firewall (Network Box) that licences SurfControl filtering software installed on the firewall device. Listed below are the SurfControl categories that are blocked or permitted.

<table>
<thead>
<tr>
<th>Blocked</th>
<th>Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult/Sexually Explicit</td>
<td>Advertisements &amp; PopUps</td>
</tr>
<tr>
<td>Criminal Activity</td>
<td>Alcohol &amp; Tobacco</td>
</tr>
<tr>
<td>Gambling</td>
<td>Arts</td>
</tr>
<tr>
<td>Games</td>
<td>Blogs &amp; Forums</td>
</tr>
<tr>
<td>Hacking</td>
<td>Business</td>
</tr>
<tr>
<td>Illegal Drugs</td>
<td>Computing &amp; Internet</td>
</tr>
<tr>
<td>Intolerance &amp; Hate</td>
<td>Downloads</td>
</tr>
<tr>
<td>Peer-To-Peer</td>
<td>Education</td>
</tr>
<tr>
<td>Phishing &amp; Fraud</td>
<td>Entertainment</td>
</tr>
<tr>
<td>Proxies &amp; Translators</td>
<td>Fashion &amp; Beauty</td>
</tr>
<tr>
<td>Spam URLs</td>
<td>Finance &amp; Investment</td>
</tr>
<tr>
<td>Spyware</td>
<td>Food &amp; Dining</td>
</tr>
<tr>
<td>Streaming Media</td>
<td>Government</td>
</tr>
<tr>
<td>Suspicious URL</td>
<td>Health &amp; Medicine</td>
</tr>
<tr>
<td>Tasteless &amp; Offensive</td>
<td>Hobbies &amp; Recreation</td>
</tr>
<tr>
<td>Violence</td>
<td>Hosting Sites</td>
</tr>
<tr>
<td>Virus/Malware Infected</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>Weapons</td>
<td>Intimate Apparel &amp; Swimwear</td>
</tr>
<tr>
<td>Block Override</td>
<td>Job Search &amp; Career Development</td>
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<td></td>
<td>Kids Sites</td>
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<td>Motor Vehicles</td>
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<td>News</td>
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<td>Personals &amp; Dating</td>
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<td>Philanthropic &amp; Professional Orgs.</td>
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<td>Photo Searches</td>
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<td>Politics</td>
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<td>Politics</td>
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<td></td>
<td>Real Estate</td>
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</table>
Chisholm has an established process to permit a specific URL may be exempt even though the category is blocked by SurfControl. If a user attempts to access a denied site, a message is displayed informing them that the web page is blocked and the category under which it is blocked (e.g. Sexually Explicit). The message also invites the user to have the site unblocked by the IT Service Desk if a staff member feels they have a legitimate reason to access a blocked site. A service request may be lodged with the IT Service Desk who will arrange for the specific URL to be allowed. Full details of the change request is logged in the Service Desk system and reviewed by a member of Library Services. The Library may override the request and leave the site blocked, although this has never happened.

7.4 Teacher’s digital literacy and training

The strategic intention of Chisholm is to massively increase its training delivery through e-learning. An e-learning plan was developed 12 months ago, and is now being implemented. It was estimated in the report for this plan that Chisholm was starting from a relatively low base of digital literacy; that perhaps 20% of teachers had little engagement with digital technology, 10% were innovators and early adopters, and the rest were somewhere in between.

So the plan focussed, among other things, on the development of teacher’s digital literacy skills. It was argued that this would increase the teacher’s technical self-reliance, at the same time as introduce them to a range of technologies and communication platforms that are part the Web 2.0 framework.

Chisholm has done a number of things to enable this.

The Diploma of VET Practice has been redeveloped so that it has a module that focuses on the use of Web 2.0 tools and the MyChisholm workspace. It’s a 5-day module, and this year, 100 Chisholm staff will go through the program.

The use of the $196,000 that Chisholm receives from Skills Victoria to promote e-learning has been radically re-focussed. Previously, teachers and discipline areas would be asked to bid for it, propose a range of e-learning projects, and then funded to do it. Chris explains: ‘That’s been happening for the past 5 or 6 years, and we cannot point to one project that has been funded that is still delivering any significant value to the organisation. Not one project has been standardised and normalised in the organisation. It’s been an unmitigated waste of time’.
So, this year, they have not requested any e-learning projects. Instead they have focussed the effort on developing staff competencies. Chris describes the process: ‘We’ve identified in each of the eight delivery areas what we call an ‘e-learning leader’, and we’ve funded them their teaching withdrawal. They are charged with working with the other teachers in their area to develop the implementation of the e-learning plan. They are accountable to their steering committee – they sit on the e-learning steering committee – and at every meeting, they need to report back on the implementation of the e-learning plan. The plan for each centre is developed by that leader, along with the head of EDC and the Executive Director of their area. I think this concept is the only one that really does move the general level of competence’.

As well as offering formal training, the e-learning leader is the mentor/coach to other staff in their delivery area. This means they are close by and on tap to help a teacher with an e-learning technology or training issue. Says Chris, ‘That’s where we’ve put our effort, in recognising that that training is imperative’.

7.5 ITC staff PD

The formal training of staff in the ICT department is paramount, and Chisholm has invested heavily in it. According to Chris, ‘the PD budget for the previous five years was smaller than what I spent on PD in the first half of 2007. Before then, they had basically received no PD. Everything was self-discovery, so systems were based and developed on ‘what I found to be best way it worked for me’ - which is why they required so much constant maintenance’.

There are several components to this PD that have been implemented over the past couple of years.

The first is a comprehensive understanding of the ITIL standards, the foundations of service management. All the staff went to a 3-day training course, where they were introduced to the common languages of incident management, service desk function, change management, financial management, service delivery, and quality management.

Then they focussed on project management – adopting the Prince2 project management framework. This was seen as essential as some change requests become projects, and approved projects need to be carefully managed to ensure that they are implemented on time and within budget.

Perhaps just as critical is to understand the process that proceeds project approval, and for this, Chisholm has adopted the Victorian Treasury and Finance Investment Management Standards (See http://www.dtf.vic.gov.au/CA25713E0002EF43/pages/gateway-reviews-and-best-practice-guidelines-investment-management-investment-management-standard)

As Chris explains, ‘if someone comes to you with an idea, is there a framework that can formalise the way in which you can engage with this person’s good idea, to determine whether it is valid or not? Is this a worthwhile investment?’

The investment management standards guide the way TLIS engages with a potential project, how to define the problem, its strategic intention, how to define the benefits and how to measure them, and after that’s all been done, what solution needs to be put in place to solve that problem.

Chris says, ‘usually it’s the other way around – someone has got a great solution, and would like to implement it. This process defines the problem first, then the solution’.

In addition to this, there is technical training, and they have spent a good deal of money enabling this. The principle is that they don’t implement a system or a service unless someone has been formally
trained to manage it. Chris: ‘It is imperative for IT, if it is going to introduce a new program, that they understand its role in education and training, and are able to deal with it technically, competently’.

7.6 ICT culture and mode of operation

So how does Chisholm ICT describe its mode of operation and business model?

It sees itself as providing a reliable IT infrastructure that also supports flexibility of response.

Chris puts it this way: ‘IT used to see themselves as the gatekeeper - the reasons why you can’t do things. But we are currently in the process of transforming that role. If Chisholm can’t be flexible in responding to our business customers, then we are irrelevant, and will go out of business’.

In this service relationship, there are three essential pillars:

- The infrastructure – managing it for flexibility
- The software or systems architecture – managing that to produce flexibility
- IT/IS competencies, around governance, service management, project management, risk/security management, software development.

According to Chris, their business model is actually very mainstream. He suggests that over the past decade there has emerged a conventional wisdom of what you need to do if you’re going to manage benefits out of an IT function within an organisation. The problem is that many IT departments have not caught up with this wisdom, and are languishing in ways of operating that have been bypassed by the real world.

Chris says, ‘Firstly, it’s all about managing technical competence. Information systems need to be standardised and consolidated – that’s infrastructure, the wires, the hardware – and then implemented flawlessly by technical people with a good competence. But then there’s the need to balance the tension between management – keeping the lights on, the train on time, budgets and quality – with leadership, which is about innovation and change, and usually destabilises the status quo. Management is all about managing stability, and leadership is about destabilisation and innovation’.

According to Chris, the only way this tension can be effectively managed is within a proper and transparent governance framework.

Chris says that without this, you usually end up with IT being gatekeepers, tying to manage and stabilise IT, and the other people out in the teaching and delivery areas are trying to be innovative and lead. ‘Without a governance framework, all you do is set up a battle between them. And so everyone in IT needs to know what governance is and why we have it, to balance the tension. It’s getting them dancing with the innovators, rather than fighting them’.

Some time and effort was spent in transforming the previous IT culture at Chisholm.

According to a report commissioned three years ago by the institution, the IT department was basically dysfunctional.

The problem was that at the top high level, there was no knowledge of what IT was doing within the business of Chisholm – what it was planning and how it organised itself. As Chris explains: ‘There was no knowledge or engagement structure for the delivery areas to monitor the performance of IT against a stated or declared standards, no way senior management could give clear directions and
hold them to account, no agreed way for IT to present proposals to senior management and for senior management to be able to evaluate those proposals against understood and agreed criteria, and no benefits management to monitor what was being done’.

Chris believes the previous outmoded model comes from an understandable technical view of the world. ‘It comes from the fact that every manager in IT used to be a PC technician of one sort or another’.

He had to work closely with the individuals who were working in IT. ‘I had to explain the turmoil that they were in. None of them felt good about their job – they felt they were working hard and misunderstood, misjudged, unappreciated’.

Within 6 months of arriving and working intensively with individuals, and saying that their world was never going to be the same again, about 50% of the staff had left.

Chris says, ‘There’s an adage: if you can’t change the staff, change the staff. That approach – tough love - is similar to the one the British government uses when it transforms low performing schools. It closes the school down for 18 months, reallocates the students to other schools, then reopens with new staff. I explained to the staff that it’s not a question of individual competence – you have an impossible task. It’s the model, the way IT is structured and your role within it that means you’re never going to succeed’.

When the institute conducted the IT governance review in 2006, it found the IT division to be ‘dysfunctional’.

Skills Victoria has just conducted a review into capability and readiness of individual TAFE institutes to take on a new SMS system that they intend to implement across Victoria. According to this inquiry, only two TAFE institutions are in a fit state to take it on; Chisholm is one of them. Chris says this is testimony to the journey they have made over the past two years, in transforming the department to a highly responsive and flexible IT organisation.

7.7 ICT challenges

The biggest challenge that the ICT division at Chisholm faces is due to their own success. The e-learning plan that they have implemented, and the access that they have opened up to Web 2.0 technologies through the staff portal, MyChisholm and MyLearning spaces, has captured the imagination and interest in what this technology can provide. This has impacted both their help service desk and the network.

Chris estimates that in the past 12 months, they’ve had 50 times more success in getting people engaged compared to the previous decade of trying to get teachers to use ‘heavier’ systems, such as TAFEVC (Blackboard). Teaching staff have contributed and created more than 1000 new pages on the MyLearning space.

‘This demand is due to the lean and agile student engagement versus big heavy legacy Blackboard-type systems. It has just been so successful. It’s not that things are going wrong – it’s actually people doing stuff and wanting help’.

Over the past 12 months, there’s been a 50% increase in calls and emails into the service desk. Chris says, ‘We’ve analysed the service calls looking for problem areas, and try to tackle and stop the calls from coming. There is no one area causing a problem – it’s just generalised. It’s just teachers trying to do things for the first time’.
Similarly, the demand on the network itself has been enormous.

‘So successful have we been in promoting Web 2.0 technology that our Internet connection is hopelessly inadequate. We’re therefore going through a process to expand the capacity. There’s the TAFE broadband initiative, and we’re working with Telstra to move from a 40 Mb service to a gigabit service, which will transform access. At the moment have a 34 Mb link between Dandenong and Frankston, so going to a gigabit link between these two centres will massively improve the services and video, etc. can be moved across the system. So, yes, there is frustration at the moment’.

The ICT department looks at this exponential demand as a temporary aberration or ‘blip’ in the life cycle of their implementation of the IT strategy and e-learning plan. In this regard, they are arguing for another person in the help service area, but only on a 12-month contract. Then, hopefully, other strategies such as the teacher digital literacy competence training will kick in, and relieve the stress on them.

Chris says that in asking for more support staff, ‘at least I can point to the fact I know how many calls we’re getting, know how many emails are coming through, we know our response rates and we know what the published services standards are. Now we can go to senior management and say these are the service standards, this is our performance, this is what we’ve done to try to perform. We’re now at the limits of capacity and can’t cope. What do you want us to do? Change the service standards, so we go out from 24-hour response, to a 48 or 72-hour? Or, are you going to provide more resources so that we can keep to the published service standards. That’s the conversation that you can have with the CEO and CFO when you’ve got hard data and published standards against which people have built their expectations. If that information is missing, all you can do is go to the CEO and say, ‘we’re not coping, and need more staff’. The CEO can easily respond and say, ‘am I supposed to allocate more resources to you on your say so?’ Having the hard data coming through the help service system puts us in a much better position to argue’.

7.8 ICT impact on teaching and learning

The impact on teaching staff has been profound, especially since the introduction of the MyChisholm portal.

According to the FLAG benchmarking survey 2007, 67% of Chisholm survey respondents said that they have delivered courses using e-learning. In effect, they mean two things: the electronic submission of assignments (60%) and the ability for students to download electronic documents (63%). The average for all other e-learning activities was significantly lower, at 28%.

However, although there are no figures yet from the 2008 FLAG benchmarking survey, according to John Collins, Co-ordinator of E-Learning Services, the increased growth of teachers engaged in e-learning is phenomenal. He puts this down to the ease of use of the MyLearning space, the use of flexible and agile Web 2.0 technologies and the ramped up training.

According to the statistics collected on the MyChisholm portal so far since it was launched in October 2008, as of June 1st 2009, 2,667 students have visited more their MyLearning site more than once, 838 MyLearning pages have been created by teaching staff and 136 teachers are enrolled as MyLearning site owners. So, in seven months, it’s a very credible e-learning engagement.
This Case Study looks at the way in which two units within the Western Australian Department of Education and Training (DET) come together to work on major ICT projects: most currently, the Online Curriculum Services Project that is being progressively rolled out to all primary and secondary schools in Western Australia.

The two units are: Online Curriculum Services (OCS) Branch and ICT Directorate.

The two units have different line managers within the organisational structure of DET: Online Curriculum Services works under the School Support Programs Division in the Curriculum Support area, and ICT reports to the Finance and Administration Division through the Chief Information Officer ICT.

The support team at OCS is currently 36 people, and there are 25 people working in the ICT unit.

The Case Study is based on interviews with Andrew Thompson, Assistant Executive Director, Curriculum Support and Deb Bevan, Manager, Online Curriculum Services from the School Support Programs Division; and Andrew Jones, Project Manager, ICT and Steve Rakich, Manager, Applications Support, ICT from the ICT Directorate.

The Online Curriculum Services OCS program will eventually service 797 primary and secondary schools, which involves 250,000 students and about 30,000 staff using the system.

One of the major services, the online teaching and learning system (OTLS) is a learning management system that provides teachers with capacity to gather together teaching resources, to plan learning and teaching, to assign to whole groups or small groups of particular individual students, learning activities. It enables teachers to monitor, assess and record their assessments as well as for students to interact both with their teacher and their peers while they’re engaged in the learning using synchronous and asynchronous tools.

DET commissioned the learning management system in 2004 after a contractual tender process awarded the work to Oracle to develop it specifically for the context of WA schools. Its brand name is Oracle Student Learning. (http://www.oracle.com/applications/oracle-student-learning.htm)

The suite of online curriculum services rely on previous significant infrastructure rollout including access to broadband networking, either through hardwired connection or through satellite to reach every school and worksite in the organisation.

A notebook for teachers program was rolled out several years ago prior, and now about 75% of the staff have their own leased notebook. This came with a standard operating environment and licensed software for office productivity and virus protection.

Andrew Thompson, the Assistant Executive Director, Curriculum Support: ‘Since about 2001, we have been making major investments in the infrastructure, as well as in policy and staff training and change management, and part of that has included roll out of devices to our schools to increase the ratio between the number of devices and the number of students. Whilst we haven’t reached a 1:1 ratio - and the DET never had the intention of doing this, as we think there are good pedagogical reasons
why you wouldn’t need kids using a computer each and every day - we have reduced the gap between the number of students and the number of devices available in their classrooms significantly during the period of time’.

They have an unashamedly centralised approach to this rollout, because there are benefits for the economy of scale, as well as benefits as a system of schools in terms of supporting the implementation of policy.

However, within that, they have a flexible approach to using a wider range of software applications than the centrally provided suite, where schools, so long as they take on the technical issues that they would have to manage at the local level using other software, can still purchase and implement application software in their school environment if they have a need for it.

Andrew says, ‘What we’re saying to the school is, how you make sense and use that software and the applications put in, and the benefit that you derive from it, is your decision in the context of your school’.

8.1 Governance

The ICT directorate is headed by the Chief Information Officer, who has responsibility in providing ICT support for the whole organisation, including education, finance, human resources, etc.

DET has a clear strategy for online curriculum delivery, driven from the top levels of the organisation through the Online Curriculum Services.

Andrew Thompson: ‘We have an OCS board of management that operates with rigorous governance processes. That board meets regularly – both myself and the CIO IT are members of that board. We make sure we attend the meetings, and if we have problems, we sort them out. We are both at that leadership level, and it permeates down to the other people involved. We are committed to this work. We demonstrate our commitment through our involvement’.

The five-year implementation plan (commenced in 2007) will see the OCS project implemented and supported in all 797 public schools in Western Australia by 2012.

The timelines in this plan are, however, dependent on budgets for support and infrastructure, workforce logistics and departmental curriculum policy directions.

The Chart below shows the OC Service and the progress thus far in its implementation.

<table>
<thead>
<tr>
<th>OC service</th>
<th>Implementation Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>An authenticated DET portal for teachers and students</td>
<td>Available to all DET Teachers and Students</td>
</tr>
<tr>
<td>Webmail</td>
<td>516 schools implemented – planned completion date 2011</td>
</tr>
<tr>
<td>Calendar</td>
<td>Provided to schools as they implement webmail</td>
</tr>
<tr>
<td><strong>OC service</strong></td>
<td><strong>Implementation Progress</strong></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Online Teaching and Learning System</td>
<td>318 schools: 173 metropolitan schools (136 primary and 36 secondary), 135 regional/rural schools (73 primary, 29 secondary, 28 district high schools, 3 remote schools and 3 schools of the air). Of the 318 schools, 127 schools have now engaged in OTLS training and 88 schools are finalising technical requirements prior to commencing training. 108 schools will commence technical readiness preparations in Semester 2, 2009.</td>
</tr>
<tr>
<td>Instant Messaging</td>
<td>318 schools Implemented alongside OTLS.</td>
</tr>
<tr>
<td>Web conferencing</td>
<td>Available upon request for non SIDE SOTA teachers. Centra licensing and integration currently being investigated.</td>
</tr>
<tr>
<td>Collaborative project workspace</td>
<td>318 schools Implemented alongside OTLS</td>
</tr>
<tr>
<td>DET Resources Online DETRO for access to curriculum resources including the K-10 syllabus</td>
<td>Available to all DET teachers</td>
</tr>
<tr>
<td>DET account manager for managing account passwords</td>
<td>318 schools Implemented alongside OTLS</td>
</tr>
<tr>
<td>Online Professional Learning</td>
<td>Available to all DET staff. Child Protection Course under development</td>
</tr>
<tr>
<td>SIS Remote access and SIS Curriculum Manager for reporting to parents</td>
<td>All DET teachers and students. (Exception is 10 MAZE schools)</td>
</tr>
<tr>
<td>SAIS Student Achievement Information System</td>
<td>All schools</td>
</tr>
<tr>
<td>Video conferencing over IP</td>
<td>Available upon request. Northam SHS trial complete; broader trial being undertaken.</td>
</tr>
</tbody>
</table>

The major attention currently is with the rollout of the OTLS, webmail, calendar and instant messaging.

Andrew believes that although the budget is significant, OTLS has been developed and rolled out economically. This is due to the strategic approach they have taken.

Andrew explains: ‘The infrastructure is something that we’ve been working on for a considerable time now. We did this work in advance of going to the rollout of software support and services that we’re providing now. In other words, we provided the fibre and the gadgets and ICT bits in place before we tried to do anything significant with it. We’re pretty confident that those things are robust - through our implementation of ITIL capacity management, we are monitoring demand and we may need to act - before we put significant effort into the teachers and what they do in their schools and classrooms’.
They were also aware that if they provided the applications without the supporting infrastructure, teachers would get frustrated and annoyed as the system failed. They are confident that the infrastructure is sufficiently robust to handle the demand of a large number of concurrent users.

Andrew: ‘It’s now becoming a matter of course that that’s what the schools are equipped with, and now they’re expecting more and better. As I go round to the districts and talk to them, even to the school teachers, about ICT and its support for teaching and learning, there ‘s a strong acceptance that this is how we do things now’.

However, this is a significant investment, and Andrew believes that there is only one real measure whether the investment has been worthwhile. And that is, ‘whether all this makes a difference to kids learning’.

‘We have evidence of that in various places, but the causal links are still a bit weak at the moment. We continue to be asked, and there will come a day when either head of Treasury or a Minister will say, ‘Tell me that it makes a different to kids, otherwise we’ll turn the tap off in terms of funding and resources that you need’.

‘Some people will say we shouldn’t need to prove that – ICT is just like a school oval – no one asks whether that’s making kids education any better – it’s just accepted that it’s part of the landscape. This is OK to a degree, but it’s incumbent upon us, to prove for ourselves, for Treasury, and teachers, that this does enhance kids engagement, motivation, learning outcomes’.

8.2 ICT help support

Supporting the whole infrastructure and the OTLS rollout is a help desk service.

It is a centralised help desk handled by phone and email, and limited instant messenger tools, a support desk and a service desk system that records and tracks service desk calls.

The system that DET uses is a proprietary system called HP Service Manager. ([https://h10078.www1.hp.com/cda/hpms/display/main/hpms_content.jsp?zn=bto&cp=1-11-85^12473_4000_100__&jumpid=reg_R1002_USEN](https://h10078.www1.hp.com/cda/hpms/display/main/hpms_content.jsp?zn=bto&cp=1-11-85^12473_4000_100__&jumpid=reg_R1002_USEN))

Although they have extended hours of service, there is flexibility because at high traffic times, with the reporting software available in the system, they can provide additional support for school and teachers, and further extend the hours.

The help desk call centre has about 70 staff managed by the DET Customer Service Centre. The first contact is from staff and teachers, and then depending on the nature of the calls, it is then escalated to experts in the customer support centre, or it may be escalated to a team externally in the business area or in the development area.

For OTLS and services directly related to students, the model is that if there’s an issue a student is facing, they escalate it to their teacher, who then has access to the help desk. In other words, students don’t have direct access to it.

The call centre company that provides the support has a base level service and base level agreement that they enter into on a yearly basis. With each project that is rolled out, such as OTLS, more demand will be created and a project agreement will be put in place to provide additional levels of support. There is a contractual obligation by the call centre to meet certain service levels, and this will
extended as they progress. The company also does forward estimates about growth, and they incorporate new requirements in the contract.

The help requests are monitored continuously, and Andrew doesn’t think that this will be an ever-increasing load on the system.

Andrew: ‘We anticipate there will be certain points where we will get increased demand, but that’s because of increased activity in a particular area or project, and expanded numbers of people using the system. We find that as we bed things down, the proportion of support falls, and requests for support and assistance does normalise over a period of time. We don’t see it as an open-ended or ever increasing endeavour if we look at it proportional to the number of people we are involving’.

There will always be a need for a help desk service as the services are continued to be embedded in the schools, and the response to any fluctuations in demand is speedy as ‘those things we can predict reasonably reliably in terms of the support we need to provide. We can track over time where we would see changes in levels of demand’.

8.3 Internet access and duty of care

For DET ICT, the biggest challenge has come from the Internet, with the new range of Web 2.0 technologies.

Says Andrew, ‘our position is that we’re building a system which will allow us the flexibility to plug and play new applications so we are trying to make it as future proof as we possibly can. Having said that, this always brings with it significant change management issues’.

The issue is that there are always teachers and students wanting to use the latest technology. But according to Andrew, the majority of teachers want to be assured that the technology introduced is useful, that it works and has the ‘desired impact on students and their learning’.

So, the ICT Directorate has to work through this tension between innovation and stability, and enable technologies and services that teachers are familiar and comfortable with, and where possible, support longevity. Although, as Andrew reflects, ‘that is relative in an ICT context. Sometimes longevity can be a matter of months, let alone years’.

He goes on to say, ‘We need to allow the outliers and support the outliers to be at the cutting edge, because we can learn from them and they will in turn - some of the time, not all the time - support the development of our whole-of-organisation systems. We need to have that cutting edge, we need to have experimentation. But we don’t want to have an approach where we have software here, gone tomorrow – because it takes a big investment of teachers time and intellectual energy to get their head around a system - and then to have that disappear on them would be most distressing and untenable’.

The OTLS allows schools to upload documents, images, movies, web links from DET endorsed content, course repositories of collected content and their own personal content collections. They have policies and guidelines about checking for third party content and copyright rules around the use of content in their online learning programs.

The DET website is filtered – high level only. Their advice to schools using the Internet states: ‘The Department of Education and Training provides a level of content filtering with its basic black list service. This is a list of banned sites that have been identified as unsuitable for the education market.'
There is provision for a request for sites to be added to the list or for a blocked site to be reviewed and reconsidered. This is done by emailing the DET Customer Service Centre.

DET provides comprehensive advice on content filtering on their CMIS website: http://www.det.wa.edu.au/education/cmis/eval/curriculum/safety/safe2.htm

8.4 Teacher's digital literacy and training

Based on the research that DET has conducted, DET is confident that teachers can reasonably use the technology that's currently in the classrooms. They have basic level knowledge and understanding of using a computer and other similar devices, and there are reasonably proficient with using basic software applications. Andrew: ‘So we’ve got a workforce that’s reasonably well appraised of basic ICT, and we’re expecting increasingly that teachers in our classrooms will have that as a minimum competency as part of their capability to teach’.

However, it’s lifting their teachers across the board to the next level that is the current challenge. The objective is for all teachers to use ICT in their teaching and learning in the classroom. This is why the OTLS is so important, as it will drive elearning into the schools, as it is the tool used in the classroom to enable elearning.

At the moment, 318 out of nearly 797 schools have the OTLS installed. It is anticipated that all schools will have the system in place by the end of 2012, and with it, the comprehensive training to use the system, so, says Andrew, ‘those people are able to work with their colleagues in supporting their adoption of the program in the schools, as well as making decisions about what purpose and what use is it going to be put to in their school environment’.

The training is provided centrally by the online curriculum services team. They work closely with colleagues in ICT as introducing OTLS into a school is a two-stage process: firstly the school makes an ‘expression of interest’ to use the OTLS. DET then checks the school’s technical readiness by sending a Network specialist out to the school to look at their networks and provide a detailed audit report highlighting the areas of the network that the school needs to improve prior to utilising the OTLS. The second stage is that once the system is implemented, DET then works with schools and staff to train a core group of 5 teachers in the use and application of the software, and the broader context of services and support that they may need.

The training is enabled through a centrally administered fund. The school can use this to provide teacher relief or to provide payments to teachers to attend the PD. Because Western Australia is experiencing a teacher supply problem, they don’t assume teachers will be able to do training during school time nor are there relief teachers available, so there is willingness for teachers to participate in training during holidays and out of hours, and the teachers themselves are paid to attend.

DET also provides professional learning online, Teachers have Class! which teaching staff can access. This service provides self-paced modules for teachers to complete in their own time.

8.5 OCS and ICT staff PD

So how do the ICT and OCS staff keep up with the pace of technological change?

First, it’s within their recruitment program, so that people who have demonstrated prior experience and self interest in and skill in using ICT software, training and change management are recruited to the teams.
For Deb Bevan Manager, Online Curriculum Services, a lot of the learning is informal and derived from utilising the technologies, reviewing current and emerging technologies being utilised in schools both locally, nationally and internationally and strong collaboration between the team members.

Deb: ‘We have a performance management approach that identifies each individual staff member’s learning needs in the context of their job and provides support for that. I think more so in a central office than other parts of the organisation, we are able to provide formal and informal access to professional learning. We have good access to learning – learning by doing, learning from colleagues, and learning by bringing people in and sending them out to conferences, seminars or whatever’.

The team structure works to support ongoing professional learning, we meet regularly, we use collaboration tools to continue dialogue, we suggest and share professional reading. We work on creative solutions to problems that inevitable arise in this work. A lot of this is about being on the job and in-the-moment conversations. But we also invite people around the world to come and talk to us, and we do send people away to listen to other people, at conferences, etc’.

8.6 ICT culture and mode of operation

The two units, OCS and ICT have worked with each other for a number of years now on different projects, and have developed a strong working partnership. Andrew Jones, Project manager, ICT says, ‘the capacity to be successful in the ongoing rollout of the OTLS is based upon the robustness of that relationship and partnership between the two areas of work’.

Part of this is due to the levels of support above them, particularly the CIO, which, according to Andrew Thompson, ‘provide support to realise our business goal, which is to support teaching and learning in our classrooms using ICT in rich, innovative and comprehensive ways’.

The other part is due to the good understanding and a willingness to do what’s required to develop and maintain that partnership. According to Andrew Thompson, ‘there has been previously divergence between those areas of work. But we’ve got over that; whatever divergences there may have been, and now we work very productively and robustly’.

For Steve Rakich, Manager, Applications Support, ICT, the relationship is ‘open and honest. It’s about communication, opening the channels of communication and understanding the challenges each side faces’.

He goes on to say, ‘Traditionally ICT departments in organisations have focused on technology and perhaps not enough on business requirements In DET, there’s been a change from the traditional approach. There is the appreciation that ICT’s role is to provide a service based on business requirements. ICT’s survival is based on the provision of customer focussed services, We’re working with the relationship based on that knowledge’.

For Deb Bevan, Manager, Online Curriculum Services, the relationship is based on a shared understanding: ‘We’ve got in our team a willingness to understand the technical aspects of the OCS Project. I think it’s important to reinforce the need for the business unit to gain knowledge, understanding and the language of the enterprise technical environment – networks, standard operating environments, the OTLS system and associated databases’.
8.7 ICT challenges

There are many challenges for DET ICT in Western Australia. The ones that are high on their current agenda are: implementing and maintaining a common network infrastructure in schools, maintaining infrastructure support for the ongoing rollout of services, supporting the Commonwealth Digital Education Revolution (DER) secondary school computer rollout and being able to support the demands innovative teachers that are wishing to adopt the latest technologies (Web 2.0, etc).

8.7.1 Implementing and maintaining a common network infrastructure in schools

As more and more teaching and learning services are being delivered into the Curriculum environment in schools through a central model, the dependency on the schools network infrastructure increases. The Department through State support has invested heavily in 212 schools to ensure that their Administration and Curriculum networks are reliable and will support the number of users accessing data over the network from within the school. The challenge ahead is to work with the remaining 585 schools and their selected Panel Integrators to bring their networks up to a common standard (Schools SOE) and maintain the networks on an ongoing basis. In some instances it can take months to upgrade the schools power to classrooms or increase the density of data points to support the increased number of workstations.

Whilst schools remain in a non SSOE world it is harder to provide customer support to their curriculum environment. The current policy of the Department for non SSOE schools is to provide call centre support to the admin network and to those teachers who are in the Notebooks for Teachers Program. The OTLS is an enabling driver to move schools to a SSOE so that they can receive support to their Curriculum environment, on the proviso that they have a plan in place to move towards SSOE.

When new technologies, such as the department’s Online Teaching and Learning System (OTLS), are rolled out, there is always an element of the unknown regarding the level of demand that the new service will place on the network. ICT need to ensure that the central infrastructure and network pipes out to the schools have the capacity to support the demand, ensuring that Departments critical services, such as webmail and the Online Teaching and Learning system, can be delivered within the agreed service levels. The content that may be used through the OCS services will vary in size - some very large, particularly with video – and a whole host of students using the network at the same time. This requires monitoring to ensure the network can meet the capacity to deliver the content in a timely manner to the student in the classroom.

Therefore the central infrastructure is continually evolving to ensure that the size of the infrastructure is sufficient to meet the Service Levels that the schools demand, and are becoming to expect.

8.7.2 The Commonwealth DER computer ratio standards

DEEWR has initiated a computer in secondary schools program under the Digital Education Revolution (DER). This program, entitled the National Secondary Schools Computer Fund has the objective of improving the computer-student ratio for those students in years 9 through 12, initially to 1:2, and then on to a ratio of 1:1. Prior to this initiative, public schools in Western Australia were funded to achieve a computer to student ratio of 1:10 in primary schools and 1:5 in secondary schools.

Whilst welcoming this opportunity to substantially upgrade the computer hardware in secondary schools in Western Australia, the Commonwealth initiative throws up significant challenges for DET IT staff in implementing the targets. It manifests itself at a number of levels.
According to DET, in some cases, the classrooms are just not large enough to hold 32 devices. ‘Even if you try to put 32 portable wireless devices in a classroom, you’ve still got problems of power, of 32 connections to a wireless which is slow, issues with multiple access points conflicting, so technology itself is not a solution in itself. It sometimes creates more problems than it solves’.

In order to accommodate this, they have had to think outside the box and are looking at creating more flexibility in the way the classroom is constructed and utilised, to ‘do different things, at different times, with different numbers of devices’.

However, this raises another issue: the speed of the computer rollout under the DER program.

The speed of the rollout means that thinking about using more flexible classroom spaces is also put under pressure. There is concern that agreed standards about ICT enriched learning spaces that do exist nationally haven’t been factored in to the BER program.

In their opinion, there needs to be an order, and orderliness to this. Andrew Thompson says, ‘We got $2.2 million to put into the devices themselves, but there’s a miniscule amount put into any sort of support for those devices, or for the infrastructure around those devices. Therefore our experience would tell us that without a lot a fancy footwork, and significant additional investment on the part of States and territories, the likelihood of failing the goals of DER eg revolutionising education, are quite minimal’.

At a school level, it manifests itself in this scenario that Andrew Jones recounts: ‘I was at a senior high school recently. They are due to receive 460 desktops under the new funding. Currently, they’ve got about 100. They have to put Java on to all of them manually – which is a week’s worth of work. The school does not have the network set up to manage the imaging of computers, and they have software that’s out of date – they just don’t have the resources to update and manage the software. Just to get the devices plugged in, there are issues’.

The challenge here is ensuring there is a basic school infrastructure in place. It will be very much up to the individual school to do this. The issue for DET is that this means that the school will be more autonomous in the control they have over their curriculum environment, and this will make it much more difficult for DET to introduce system-wide software across that platform.

8.8 Supporting Innovative Teachers (Web 2.0, etc)

For the ICT division, the small number of teachers who want to be innovative through the use of the latest Internet tools to improve learning in the classroom, there are many challenges.

On the one side the ICT and OCS divisions, are willing to invest in the innovator’s time, intellect and interest in trialling new technologies, as there are benefits for all in doing this: their innovations and experiments can be learned from, and then at some stage, where they are relevant, they can be introduced across the whole organisation. But on the other hand, the innovator is often impatient with the time lines to adopt the technologies from a central level, and they can become DET’s greatest critics. Where possible strategies have been put in place such as allowing schools in the 212 LWICT group to implement their own software under Tier 3 however this can have its compromises in terms of what can be implemented within the network for security reasons, and requires the school to have a level of technical expertise to implement and support the technologies.

Andrew Thompson: ‘Some people have very strongly held views about which is the right way to go based on nothing more than their personal preferences. They will very happily tell all comers about how they’ve got it all right and how this big organisation – DET – has got it all wrong. This is par for
the course. Let it happen. We don’t want to stifle innovation by any means, but we recognise that we work with a system of schools, and the majority of staff in our schools are nowhere near and never will be at that innovative, leading edge. We’ve got to provide support for those mainstream teachers, whilst bringing into every classroom the reality that is supported and enriched by ICT’.

So the ICT directorate has to adopt a whole of organisation approach that is based on primarily supporting the mainstream teacher – where they are at in terms of their ICT skills and knowledge, and build out from there; whilst balancing a level of flexibility to allow schools to experiment where they have the technical capabilities.

Part of the process is also determining, particularly with Web 2.0 technologies, what is just a passing fad, and what is critical to student’s learning.

According to Steve Rakich, Manager, Applications Support, ICT: ‘We are guided by the business in respect of the relevance of technologies in the classroom - but we need to be in a position to react quickly so we’ve got to start planning well in advance. Our strategy is to look at emerging technologies and trends and to start the planning process early when a need has been identified. Engagement with the business in respect of provision of advice on technology directions and gaining an understanding of business directions is a key factor of the strategy’.

8.9 ICT impact on teaching and learning

The 2009 OTLS usage data shows an increase in the adoption of the OTLS in comparison with 2008. So far in 2009, there have been 2429 unique users who have logged in and utilised the OTLS in the classroom. It should be noted that the OTLS is not a mandated system and the individual teacher has the choice as to whether they wish to utilise the tools and to what level they are embedded into the curriculum.

A survey undertaken in 2009 of teachers who participated in Module One OCS training showed that 95% of the teachers believed that OCS training is relevant to their teaching and learning needs. In addition to this, an independent evaluation report on the OTLS found that 74% of teachers reported that OTLS activities help students think and learn in different ways, 74% of teachers reported positive impact on student participation and 71% reported positive impact on student behaviour using OTLS.