



The Ultranet - Research & Development Initiative

Background

The Victorian Department of Education and Training is undertaking a joint Research and Development Initiative with the Oracle Corporation to help support a number of the key flagship strategies outlined in the Minister's Blueprint for Government Schools. Specifically, the Research and Development Initiative aims to produce the prototype for a student centric system that supports teaching and learning, curriculum delivery and the management of knowledge in Victorian schools. The prototype, to be known as the *Ultranet*, will be based on Oracle's L360 design and provide the functionality of the Glen Waverley Secondary College intranet. The Ultranet will be developed and tested in a selection of Primary and Secondary schools (to be known as R&D Schools) to provide the information required for the implementation and evaluation of the prototype solution in a range of school settings.

Experience within Victorian schools and other schools world-wide has shown a capacity for ICT to transform schools. This is also supported by international research.

...ICT therefore needs to be seen as a key, integral element of the school reform agenda: freeing up time and energy to help remodel the school team; enabling efficient knowledge management within schools; supporting knowledge transfer between schools and outreach to parents and the community; as well as being a hugely powerful medium for transforming teaching and learning....

.... Encouraging development of integrated (curriculum and management) networks in all schools in order to build coherent managed learning environments (MLEs) which maximize pupils' opportunities to learn and schools' capacity to manage this; and making effective use of electronic communications to enable schools to receive important information in a timely manner and use their own professional judgment to select the information they wish to receive....

Charles Clarke – UK Secretary of State for Education and Skills

Victorian schools have been involved in several national and international research studies in recent years. The findings from these case studies indicate that ICT is most effective in schools when it is integrated into the broader framework of the whole school environment so that it becomes a part of day to day work practice.

The schools that engaged in integrating information and communication technologies into school learning environments were mostly involved in either enhancing learning with ICT or through ICT. In the main, schools sought to address learning about ICT, believing that students would gain sufficient exposure to the technology to learn all they needed to know about it. The innovations were fairly evenly split between laptop programmes, on-line and internet-based learning initiatives, and the integration of classroom-based desktop computers and peripherals in learning environments. The schools demonstrated the impact of ICT on cognitive curriculum outcomes, meta-cognitive outcomes, affective outcomes and the development of social competencies. In many cases, the ICT innovations were also an integral part of a much broader framework to reform school organisation and learning environments to better meet the needs of individual students. A significant element of the use of ICT was its capacity to provide almost instantaneous feedback to the learner and to teachers about whether their practice was achieving its aims.

Peter Cuttance – Innovation and Best Practice Project



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The overwhelming impression one forms after being in the school is that it is a place that values learning. It describes itself as a learning organisation and assiduously works on achieving that as a major goal. In classrooms, students are engaged and enjoy a challenge. In return they challenge teachers to provide a learning environment which leads to higher learning. Teachers participate in a personal program of on-going professional learning. The senior management consistently advocates processes and programs designed to continually improve learning and teaching at the school. ICTs are an integral part of GWSC. They are found in all areas of the school, including most classrooms and all staffrooms, enabling routine access for students and staff. The college is a technology rich learning environment where students and teachers access the technology tools they require not only from all areas within the school but from home as well.

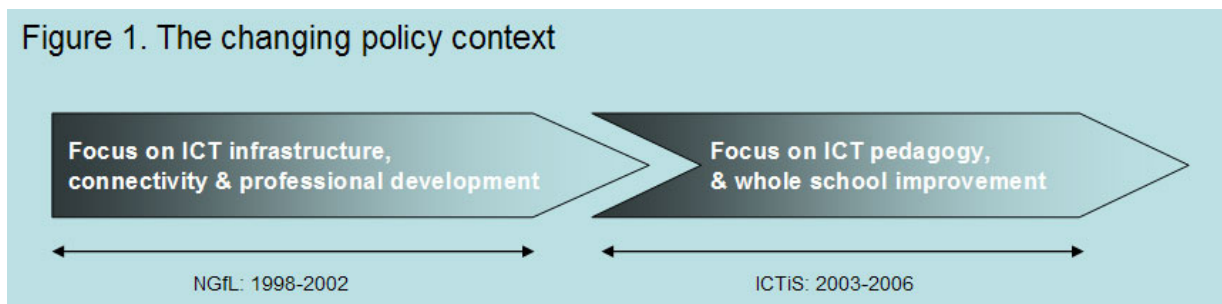
OECD Australian Case Study 2001

Victoria has been a world leader in the provision of technology to government schools. We have seen the provision of high quality software to schools through the Microsoft licensing agreement and Software Rolling Fund, VicOne provided internet connectivity to all schools, EduNet, EduMail and, of course, the Notebook for Teachers programme. These initiatives have been essential in developing schools' and teachers' capacity to engage with ICT but the challenge is to now shift the focus from one of peripheral engagement and supply to holistic intent and demand. This point is best illustrated in Figure 1 below, taken from Charles Clarke's statement on transforming teaching and learning through ICT in schools.

The primary purpose of the Ultranet is to provide an ICT framework that allows the whole school community to engage with learning in ways not previously possible by:

- Enabling better communication between all key stakeholders including students, teachers, parents, support staff, principals, school administrators, regional and departmental administrators;
- Simplifying many of the administrative requirements of schools and teachers – less time spent on gathering data, more time spent on acting upon it;
- Facilitating greater collaboration between individual teachers and teams of teachers within and across learning areas and schools;
- Supporting teaching and learning through the sharing of ideas and resources;
- Extending the scope of what can be achieved by circumventing many of the physical and organisational constraints placed on the classroom teacher;
- Enabling unprecedented transparency of the classroom;
- Providing continuous and ongoing feedback to parents, students and student managers;
- Creating knowledge about every student's learning and progress as well as knowledge about the process of teaching and learning. Knowledge that is created at an organisational level, that is preserved from year to year and is both transferable and extendable.

Figure 1. The changing policy context





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Overview

There are already numerous applications that support aspects of teaching and learning in various ways in schools in Victoria, these include; content management systems; timetabling and booking applications; attendance and roll marking systems; reporting and assessment packages. The adoption of such systems varies from school to school and different systems may be deployed in different schools. While there is usually some level of integration between different systems within a school, integration is not seamless. There are often gaps in the data held in the different systems that make cross-referencing information in a timely manner problematic.

The 'disconnect' of these systems limits the potential for ICT to be embraced effectively across all aspects of school life. While most schools can point to examples of outstanding uses of ICT, it is often restricted to small groups of teachers or individuals. The impact of such innovation generally has limited reach and quite often dissipates as teachers move on to other schools, year levels or projects. This can not be attributed to a lack of commitment or enthusiasm; teachers and support staff involved in such initiatives usually work above expectations. Our teachers are pioneers, they are exploring (and for the most part succeeding) ways of using ICT to bring about better outcomes for their students – but they are doing this without a structure that allows this knowledge to be constructed, and consequently built upon, collectively.

It has been demonstrated at Glen Waverley Secondary College and other schools that providing an intuitive interface that seamlessly brings together various aspects of classroom 'business' (teaching and learning plus other associated administrative functions) into a single, central, logical environment has a profound impact upon the way teachers, students, parents and other key staff share information and cooperate. A truly synergistic effect, where knowledge builds on knowledge, emerges in such a way that knowledge is created within the organisation itself rather than just for the individuals that make up the organisation.

Thus, the Ultranet cannot be described by any of the 'tags' that are commonly used to describe ICT initiatives in education. It is not about 'online learning' or 'content management' or any other particular aspect; it is about bringing together the key processes involved in the day to day running of a school and a classroom. It pervades the very culture of the school becoming an indispensable part of routine work practice.

For example; a teacher just starting to experiment with 'online learning' may undertake one online activity with one class in one semester, another teacher may undertake several online tasks, yet another teacher may undertake none – there is an element of 'opt in' or 'opt out'. Thus, while being very powerful, it is difficult for online learning to take root and become part of the culture of a school, limiting its capacity to grow and develop.

But the Ultranet is about the 'business' of teaching and learning: planning; noting observations; giving and receiving feedback; assessment; reporting – things that teachers and students do every day – there is no element of 'opt in' or 'opt out'. Teachers mark their roll on the Ultranet; they read bulletin notices on the Ultranet; they enter assessments on the Ultranet; they plan lessons on the Ultranet. It becomes part of 'what they do'. So when a teacher starts to experiment with 'online learning' the undertaking is clearly visible to other teachers in the school. It can be readily picked up and modified or extended. It quickly builds up a head of steam and becomes rooted in the culture.



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Anecdote: Jen and Sally-Anne

Jen has been teaching History for several years and is close to retirement age. Since the introduction of the intranet at Glen Waverley Secondary College, Jen began to experiment with asynchronous online discussion forums. She found them to be very useful in receiving and giving feedback to students and was using them to great effect. By incorporating the discussion forums with other aspects of the online classroom on the Glen Waverley Secondary College intranet, Jen developed an exciting and engaging course that is becoming increasingly popular with students. So much so, that this year there are now two classes of History at Glen Waverley Secondary College.

Enter Sally-Anne. Sally-Anne, takes the second History class at Glen Waverley Secondary College. Sally-Anne 'imported' Jen's online course into her own classroom space. Sally-Anne has quite a different style to Jen and she modified and extended many of the activities, building on the ideas that Jen originally developed. This, in turn, has positively influenced many of the things that Jen does in her class.

Sally-Anne doesn't just teach History, she also runs the library and teaches English. Her experience with the online History classroom has positively influenced her practice in these other areas and has impacted on the other librarians.

Jen and Sally-Anne use the online History classroom as a focus for an in-house PD session and many of their ideas are now embedded into practice for teachers across a number of faculties.

Of course, much of what has been described in this anecdote *could* have been achieved without an intranet but the reality is that it would not have. The fact that the intranet (at Glen Waverley Secondary College) is being used as a routine part of daily business, breeds familiarity and encourages teachers to use it in innovative ways. With minimal administrative effort (the online classroom is automatically created with students already enrolled; any element can be created in two mouse clicks), Jen was able to set up her 'discussions' and other activities. The ability to save and build and share meant that it was very easy for Sally-Anne to 'tap' directly into Jen's classroom – quickly reproducing all of the activities that the students would be undertaking. Furthermore she could easily extend the work, bringing her own ideas to it. None of this can be easily accomplished without an intuitive, seamless, integrated environment.

Other aspects simply could not have been accomplished without the intranet. Parents are able to 'enter' in to the online classroom at any time to follow their child's interactions with the teacher and other students, as well as access any assessments and attendance history. Parents no longer need to wait for parent-teacher night or the end of semester report to get a sense of how their child is progressing. Student managers can review a student's progress from their desk.

But the intranet at Glen Waverley Secondary College (or any other school) is limited to one school and the richness of information that builds around a student is limited to the student's time at the College. The Ultranet is a single logical system for all schools; each school has its own personalised manifestation of the Ultranet, but the rich picture of a student's progress builds centrally and can be passed on and extended from year to year and school to school. Diagnostic measures can be drawn from this rich information and aggregated to classes, year-levels, schools and regions: thus providing the entire school system with rich, timely and valid information.



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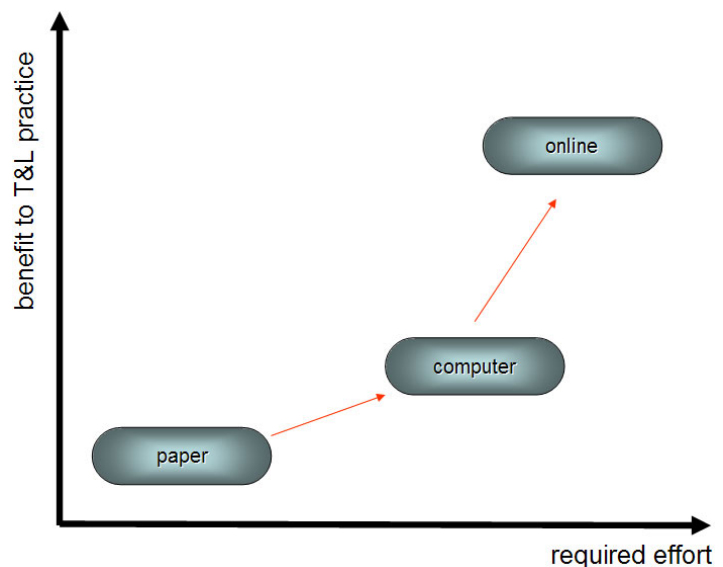
Support

We have already seen a change in work practice for many teachers in Victoria; more teachers are using their computers to prepare course notes and planning documents, keep assessments, mark rolls, record observations or notes and write reports. The benefits of using the computer for these things are clear: greater re-usability; collaboration and, ultimately, increased efficiency. Of course, this has not lead to decreased work load but it has lead to improved standards.

All schools understand the type and level of support required to help staff move from an essentially paper based world, to a computerised one. Professional learning is an expectation of all teachers and all schools have embedded it into their programmes.

In Victoria, we have already begun to see the focus of professional learning shift from the more technical to the more pedagogical aspects as we shift from being less 'supply driven' to become more 'demand driven'.

Clearly, the Ultranet has a direct impact upon teacher work practice and, as such, there will be implications on work load and support structures. But in many respects the 'hard yards' have already been done. For most teachers, the transition to using an online environment, the Ultranet, will require less effort than the transition from paper to computer, yet the benefits will be far greater.





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Deliverables of the Prototype

DE&T and Oracle are currently working toward finalizing the scope of the functions that will be delivered by the prototype. The software itself is yet to be developed and it is envisaged that, as part of the implementation, a clearer understanding of the functional requirements will emerge. Nonetheless, it is believed that the prototype will provide some functionality to the R&D schools in the following areas:

- Professional Development
- Attendance and Roll Marking / Excursions
- Timetabling / Daily Organisation
- Bookings
- Lists
- Notifications / Messaging
- Course Planning
- Lesson Planning
- Assessment and Feedback

Professional Development

Professional development is critical to the success of any initiative. The Ultranet is conducive to 'informal' professional learning. Schools will be able to organise their internal PD programs online. Teachers will be able to select and enroll into programmes as well as reflect upon, record and track their own learning (including external or informal PD).

Attendance and Roll Marking / Excursions

All teachers will be required to mark rolls online during class. This means that, where a networked computer is not available, teachers will be required to bring their notebooks to class. Excursions and other events (sport, instrumental music, RE, Literacy, etc) will also be planned online so that, in such cases, the teacher can see where a student is meant to be. Replacement teachers can mark rolls when the regular teacher is absent, so the teacher does not need to keep their own personal roll.

Live attendance information (and attendance history) is available to coordinators, parents and students as well. Student managers spend less time checking rolls which leaves more time to following up the reasons behind the absences.

Timetable / Daily Organisation

The Ultranet will not provide a timetabling or daily organisation engine, but will interface to any such systems. All authorized people in the school community may access the timetable from inside or outside the school. Personal timetable/daily org information is pushed to the teacher/student (eg personal notification of replacement class).

Bookings / Lists / Notifications / Messaging

Book a computer lab from home or post a bulletin notice from your desk, this group of functions greatly reduces the time spent on 'administrivia'.



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Course Planning / Lesson Planning / Assessment and Feedback

All of the functions listed to this point target improving administrative efficiency. Each is of importance in its own right and many are already being met, with varying success, through systems already in place in schools. However, the integration of these functions with the Teaching and Learning aspects of the Ultranet is what enables its true power.

Through their log on, teachers, students and parents are presented with a secure environment that contains all of the relevant information about their specific classroom. In effect it allows the creation of a 'virtual classroom'. With two mouse clicks, the teacher can review their students' programmes and achievements from previous years; they can look at a range of diagnostic indicators and review notes or observations of their students made by past teachers.

Faculty or other teams of teachers can plan courses, creating tasks, assessments or outcomes that are explicitly linked to the CSF. The plans can be re-used and modified from year to year, course to course, class to class and potentially even school to school. As students complete assessments, teachers enter the results directly into the online environment, so that a picture of the students' progress emerges.

The preceding paragraph describes a minimalist approach to using the Ultranet. The requirements placed on the teacher hardly exceed (and may even reduce) those requirements currently placed on teachers using an electronic reporting package for example. But the Ultranet goes beyond just being a mechanism for storing grades. Teachers can plan out the activities that they will be undertaking in the classroom. Some teachers will plan an entire course at the beginning of the year others may plan 'on the fly' creating items as they go. The items they create could be thought of as lessons or activities; they may be just a description of the activity; they may permit students to give feedback, either individually or in groups; they could be used for self assessment, peer assessment, teacher assessment; they could be used for formative or diagnostic purposes; they could incorporate online resources and may even be undertaken entirely online.

As teachers develop these 'lesson plans' they are saved and can be shared or 'swapped'. A new teacher coming in to the school could pick up another teacher's lesson plans and modify them at will. Teachers and students can cooperate more effectively, it's possible to share virtual classrooms and effectively team-teach even when physical constraints don't allow it. It may even be possible to solicit input from parents, so that teachers are dealing with parents on their own terms in the context of a classroom activity or issue.

Parents have access to the 'virtual classroom' so they can follow the activities that are taking place and can track their child's progress.

Teachers at Glen Waverley Secondary College have been exposed to such an environment for over a year and there is a vast array of approaches to the way in which teachers are using it. But the one thing that is palpable at the school is that it has led to a culture of openness where ideas are continually being shared, put in to practice and improved upon. It is the fabric upon which the organisation constructs its knowledge and it is instrumental in the school achieving its goals.



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The Benefits

The benefits to teaching and learning are obvious:

- Teachers are far more able to communicate effectively with their students (particularly in secondary schools).
- Parents are provided with ongoing and continuous information about what is happening in the classroom and their child's progress.
- Student managers have access to rich, meaningful information about the students.
- Cooperation and collaboration between teachers (potentially teachers from different schools) is greatly facilitated.
- A longitudinal view of the students is maintained even as students move from school to school which, in turn, better informs teachers about the students in their duty of care.

But the benefits are not restricted to just students, parents and teachers. The information maintained in the system is accessible to authorized people throughout the Department at appropriate levels of aggregation. The Ultranet will provide the Department, the Regions, school clusters and the school leadership with much richer and timely information about what is happening in schools:

- Better indications of student achievement and attendance.
- Information about the time spent in KLAs and a clearer picture of the courses and types of activities being undertaken (which could be of huge benefit to the curriculum authority).
- Indications of the type and amount of Professional Development being undertaken in schools and externally.
- Information around the usage patterns of physical resources (computer pods, digital cameras, etc)

The data provided by the Ultranet will better inform decisions made at all levels. It will give people external to the school greater transparency and facilitate greater communication between and across levels throughout the department. Just as the intranet at Glen Waverley Secondary College has become the vehicle that has helped to build a cohesive, intelligent organisation – the Ultranet has the potential to align schools and the Department far more strategically and permit the construction of more accurate, meaningful and richer knowledge within the organisation as a whole.



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Related Articles

Charles Clarke:

Fulfilling the Potential – Transforming teaching and learning through ICT in schools

<http://www.ncsl.org.uk/index.cfm?pageID=edu-publications-fulfillingthepotential>

OECD/CERI ICT Program:

ICT and the Quality of Learning – An Overview of the Australian Case Studies

<http://www.oecd.org/dataoecd/31/52/2732684.pdf>

Commonwealth Department of Education, Science and Training (DEST):

Innovation and Best Practice Project

<http://www.dest.gov.au/schools/publications/2001/innovation/index.htm>

Simon Gipson, St. Michael's Grammar School, Melbourne:

Issues of ICT, School Reform and Learning-Centred School Design

<http://www.ncsl.org.uk/mediastore/image2/gipson-issues-of-ict-full.pdf>

Graduate School of Education, University of Bristol, UK:

E-Learning for Leadership: Emerging indicators of effective practice

<http://www.ncsl.org.uk/mediastore/image2/randd-lit-review-e-learning-full.pdf>