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AISV Project: The Development of Thinking Skills Through ICT

Final Evaluation Report

December - 2008

Evaluation Team

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Executive Summary

This summary reports the findings of the evaluation of The Development of Thinking Skills through ICT project. This was designed and implemented by the Association of Independent Schools of Victoria (AISV) in 2007, to explore the way in which the effective use of ICT can support the development of higher-order thinking skills in students. The project was partly funded through the Australian Government Quality Teacher Programme (AGQTP). AISV contracted Tom March (External ICT Consultant) to implement the project in eight selected independent schools in Victoria. Tom March developed the MyPlace website - a unique resource for this project designed to provide pedagogical and technological information for teachers.

In December 2006, AISV commissioned Deakin University to conduct a formative evaluation of the project. The evaluation used an interpretive methodology utilising a range of data generation methods, to gain insight into the promotion of students’ higher order thinking skills via ICT. The data were considered from multiple perspectives including from the consultant, teachers and students. An Interim Report was submitted to AISV, in August 2007, to support the successful implementation of the project (Appendix D).

This executive summary will report on the answers to the research questions

1. What ICT facilities and resources are available in the schools that can be utilised in the implementation of the project?

All of the schools involved in this project have excellent ICT resources, including fast broadband connectivity, laptop computer access available to all staff and students, with the only limiting factor in some schools being the restriction on access to Internet sites.

2. How can curriculum content and delivery methods be constructed so as to support thinking skills as investigated through the five thinking characteristics: Higher-order thinking, Metacognitive awareness, Team work/collaboration, Affect towards school/learning and Ownership of learning?

Teachers incorporated the technologies in creative and meaningful ways to support existing curriculum and content to promote the development of thinking skills. They were encouraged to adopt new delivery methods using Web 2.0 technologies such as blogs, podcasts, and class portals. Students, in turn, responded to stimuli, conversations and challenges and reported feeling ownership of their learning due to the personalization and participation that this approach offered. Students were able to be creative when using digital technologies to represent ideas in multiple ways. Their work reflected the development, to varying degrees of the five thinking characteristics.
3. What aspects of the teaching approaches that use learning technologies support each of the five thinking characteristics? For example: examining the appropriateness of the methods used to support the development of higher order thinking skills for students.

The project resulted in the development and extension of existing pedagogies as teachers capitalised on the characteristics of the Web 2.0 technologies. They set challenges and posed big questions that required students to analyse, evaluate and use other thinking routines. Teachers valued students’ responses and opinions and provided them with varying degrees of choice as to what and how they learnt. They created a digital learning community where Internet resources, web-based forums, and digital resources were used. This allowed for easier access, greater flexibility and more interactive programs for students. The greatest learning value of the Web 2.0 technologies was demonstrated in the interactivity and communication that took place amongst the members of the online community. The Web 2.0 technologies used provided all members with ample opportunities to remix, recreate, respond to others and construct meaning.

The evaluation identified some significant characteristics – not necessarily unique to the Web 2.0 learning technologies, but supported by them - that were used in various teaching approaches to create learning opportunities to support thinking, for example:

- having a purpose to all tasks;
- situating these in a meaningful, authentic context;
- accessing and using stimulating original material commonly including audio, visual and text data;
- giving ownership to students;
- providing feedback;
- allowing choice so students could direct their own learning;
- promoting a love of learning.

The evaluation helped to illustrate some of the active and passive capabilities of the Web 2.0 technologies in school learning situations primarily through:

- communication among teachers and students by using various structures such as weblogs;
- accessing /sharing information, getting feedback, reconstructing data, responding to data, etc.;
- being a repository of information, data that allows flexibility and choice in when and how the information will be used.
• utilization of various modes of data—such as video, text audio through a
variety of formats—e.g. class portals, podcasts, and Internet links (including
links to animations, simulations and interactive sites).

4. In a case by case situation, for each teacher and students, how successful is the
intervention in achieving a positive change in:
   a. Teacher classroom practice?
   b. Teacher understanding of the potential role of ICT to support higher-order
      and metacognitive thinking and effective pedagogies relating to these?
   c. Teacher utilisation of ICT resources and facilities such as blogs, wikis, pod
      casts, web-quests etc?
   d. Students’ opportunities to perform higher level thinking skills?
   e. Students’ metacognitive awareness?
   f. Teacher and student attitudes to virtual learning environment (VLE)?
   g. Collaborative relationships among and between teachers and students?
   h. Students’ sense of ownership of their learning?

The evaluation showed that at the beginning of this project, most of the teachers
involved in this study did not have a good understanding of Web 2.0 technologies and how
these could be used in teaching. However, by the end of the project most of the teachers had
improved their understanding of the potential of the technologies and three of the thirteen
teachers were using the technologies extensively. Teachers who excelled in the project were
intrinsically motivated and were highly interested in the use of ICT in promoting learning. All
teachers who attended the PD improved their ICT skills by being involved in the project.

Among teachers the change in practice as a result of the project varied. The impact on
teaching could be seen through various examples that included change in practice such as:
increased teacher confidence and self efficacy, the use of new teaching approaches and new
stimulus material, being more inclusive of students, building teamwork between students and
teacher, having increased pedagogical / technological knowledge, and promoting thinking
skills and metacognition.

The project encouraged teachers to develop a unit of work that embedded technology
in pedagogically sound methods. The resources required for this included: time to become
skilled and develop new programs, a suitable teaching context, access to resources, ongoing
support from the educational consultant and recognition for their efforts from school leaders.

The ICT and Web 2.0 technologies made use of Internet resources, web-based forums,
digital learning communities, and digital resources that allowed easier access, greater
flexibility and more interactive programs for students. All teachers who attended the PD
established online class portals and developed lesson sequences that used the Web 2.0. Not
all students were familiar with the Web 2.0 technology, for example not all students were
certain bloggers, rather, students tended to be very uncertain about their postings possibly
because it was in a school forum; with minimum requirements being met by students. Web
2.0 technologies being used to promote students learning was evidenced through a variety of
ways including: promoting engagement and choice, providing opportunities for creativity,
providing for participation and receiving feedback, being flexible, and allowing collaboration.

The importance of online/digital learning communities are developing as significant
ways of learning that utilise new technologies. Some significant aspects identified in this
project include: triggers or reasons to write or respond, stimulus material, consistency in
postings, developing an online presence and personality and building confidence in writing.

There was direct evidence of the development of higher order thinking in students’
tasks such as Web-quest, blogging and challenges that encouraged analysis, evaluation and
creativity. However there was only indirect evidence of metacognition.

Teachers and students involvement on the MyPlace website - ranged from minimum
to high involvement. There was some degree of communication across three class portals and
greater communication among students within individual classes. Two teachers successfully
set up ongoing weblogs for global audiences.

5. *What aspects of the professional learning program have provided opportunities
   for teachers to encourage their students’ higher order thinking skills?*

6. *What aspects of the learning technologies have provided opportunities to
   encourage students’ higher order thinking skills?*

The professional development program provided intensive instruction and ongoing
support for all participants. The primary theoretical framework, proposed by the educational
consultant to underpin the pedagogies and the technologies includes five components -
Choice, Effort, Quality, Attitude, and Labour of Love (CEQ.ALL). Some of the case studies,
conducted as part of the evaluation showed how the CEQ.ALL philosophy impacted on
teachers’ pedagogies with some teachers considering it to be critical to the success of the Web
2.0 technologies. The pedagogical approaches suggested by the Educational Consultant such
as Thinking Routines, class portals, webquests, RSS feeds etc provided opportunities to
encourage students’ higher order thinking skills by situating the technologies in a meaningful
student-centred context.

Implementing the project in a real unit of work was pivotal to the success of teacher
PD. The personalised professional development in Web 2.0 technologies, provided by the
Educational Consultant, allowed teachers the opportunities to develop their own expertise in
the new technologies, before selecting appropriate pedagogical techniques to integrate the technologies into their own teaching context.

The professional learning program provided excellent resources, feedback and support for teachers. The Educational Consultant modelled sound pedagogical methods on the web space for the MyPlace project. However, the online communication anticipated to occur between the students and teachers across participating schools occurred only amongst three schools, and only after the ‘webquest challenge’ provided a common task across the schools. It was possible to take advantage of students’ technological prowess with new technologies and encourage them to apply these skills and technologies to content in the school curriculum. This indicates that while the technology allows students to communicate easily on the common task, the technology alone is powerless without a context and purpose for the communication to occur.

The “hands-on” PD sessions were valued most highly, with teachers appreciating the direct access to the experienced Educational Consultant who provided them with a variety of instruction and resources, and modelled particular pedagogies.

The capacity of Web 2.0 technologies to enable digital global communication was evident from this project. Two teachers in the project became active in global web communities directly as a result of their participation in this project. They modelled being active learners and their personal development is evidenced in their individual weblogs.

The report provides data to support this summary.
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Introduction: Background of the project and aim of the evaluation

The Development of Thinking Skills through ICT project was designed by the Association of Independent Schools of Victoria (AISV) to explore the “way in which the effective use of ICT can be deployed to support the development of higher-order thinking skills in students” (Calnin, 2006)(Appendix E). An Educational Consultant, Tom March, was appointed to work closely with the Project Manager, Dr. Gerard Calnin, Director of AISV Policy and Research, to develop and implement the project in selected independent schools in the metropolitan area of Melbourne, Victoria.

The primary theoretical framework expressed by the Educational Consultant to underpin the pedagogies and the technologies for the project included five components: Choice, Effort, Quality, Attitude, And Labour of Love [CEQ.ALL](March, 2006) and focused on five areas identified to enhance students’ thinking skills: Higher-order thinking, Metacognitive awareness, Team work/collaboration, Affect towards school, Ownership of learning. These five focus areas are consistent with recognising the need for both individual and social opportunities for construction of meaning, and intrinsic and extrinsic motivations for learning. The proposal (Appendix F) outlines the significance of each of these and suggests appropriate and specific pedagogies to target them.

The aim of the evaluation is to provide an assessment of:

- the ICT (Information Communication Technology) facilities and resources available in the schools that can be utilised in the implementation of the project.
- the pedagogical approaches that enhanced higher order thinking.
- the professional learning program, particularly those aspects that provide opportunities for teachers to encourage their students’ higher order thinking skills.
- how the Learning Technologies provided opportunities to encourage students’ higher order thinking skills.

This report is designed to add to and enhance the understandings identified in the Interim Report submitted to AISV in August 2007(see Appendix D).
Research Literature

Web 2.0 technologies make use of the Internet to allow greater collaboration and sharing of resources among a community of learners. The technologies include wikis, blogs, RSS feeds, social bookmarking and social-networking sites. Ubiquitous computing describes the widespread way in which computers and our lives are becoming indistinguishable (Ley, 2007). Generally younger people have greater expertise with these technologies than older people - evidence of the digital divide (Prensky, 2001). Research has shown that the presence and use of the technologies are influencing the way people learn, with increased visual genres, greater interactivity, and immediate feedback. Because the systems of technologies are changing at a rapid rate that has not previously been observed, teachers are faced with the challenge of constantly learning new skills needed to use the new technologies with which students are often more familiar. ICT is an area all teachers are responsible for and one they must include in their teaching and hence there is a need for all teachers to be able to teach using ICT effectively (VCAA, 2005).

This project addressed the need to equip students better for the technological society of the future: “Our educational goals need to move ‘beyond the acquisition of skills and knowledge, to one that emphasises process and evidence of understanding that will empower students in developing as lifelong learners’” (Watson & Kairouz 2002). As knowledge workers, students will need to access and manage information; more importantly, they will need to sift material, test it for reliability, synthesise and analyse, transfer knowledge to new situations, solve problems and challenge traditional canons” (March & Calnin, 2006). According to Edgar, (2008) “teachers are falling way behind in mastering the educational changes in teaching and learning that new media herald”. There is increasing demand for teachers to include current technologies in their teaching and this project provides some insight into how this may best be achieved.

Web 2.0 is a term to describe the evolution of technologies that make greater use of the web browser interactivity capacity to allow the user much greater power, personalisation and participation (Hinchliffe 2008; O'Reilly, 2005). Software and applications such as Google Maps, Wikipedia, Facebook, Blogs, Flickr, podcasting, RSS feeds, and social bookmarking have developed in response to these increased capabilities. The diagram copied from Hinchcliffe (http://web2.socialcomputingmagazine.com/), represents some of the developmental aspects from The Web (now referred to as Web 1.0) to Web 2.0 technologies and projecting Web 3.0.
Figure 1 The developmental aspects of the use of the Web – Web 1.0, 2.0 and 3.0 as described by Hinchcliffe (http://web2.socialcomputingmagazine.com/)

Individual users can remix and recreate data – searching, selecting and creating new interpretations and presentations of data that meets their personal requirements. In this way the Web 2.0 technologies have great potential for teaching and learning, not only providing students with access to information, but more importantly allowing students to choose, create, evaluate and interact with a selective or global audience. This project uses “Web 2.0” software to take advantage of digital technology’s power to engage students in personalised learning that promotes thinking skills. The Educational Consultant is an expert in the Web 2.0 technologies and demonstrated pedagogically sound methods of using the Web 2.0 technologies appropriately and meaningfully. The AISV proposal for this project argues: “Web 2.0” software to take advantage of digital technology’s power to engage students in personalised learning. …..the online environment will be designed to honor user-autonomy, facilitate achieving intrinsically motivated goals, and use community and social networking to promote rich, contextualised learning experiences.” (March & Calnin, 2006)
Project Evaluation

This report describes the evaluation of the project by the Deakin Research Team. It includes: a description of the project, profiles of the schools and participants, the professional development program, an evaluation of the professional development program, a description of the digital communities established by the participants, changes to teachers’ practice, evidence of the impact of the CEQ.ALL philosophy, evidence of teachers use of pedagogies that promote thinking skills and evidence of the impact of the Web 2.0 technologies.

The Research / Evaluation Questions

The evaluation of the project addressed the following research questions

1. *What ICT facilities and resources are available in the schools that can be utilised in the implementation of the project?*

2. *How can curriculum content and delivery methods be constructed so as to support thinking skills as investigated through the five thinking characteristics: Higher-order thinking, Metacognitive awareness, Team work/ collaboration, Affect towards school / learning and Ownership of learning?*

3. *What aspects of the teaching approaches that use learning technologies support each of the five thinking characteristics? For example: examining the appropriateness of the methods used to support the development of higher order thinking skills for students.*

4. *In a case by case situation, for each teacher and students, how successful is the intervention in achieving a positive change in:*
   a. Teacher classroom practice?
   b. Teacher understanding of the potential role of ICT to support higher-order and metacognitive thinking and effective pedagogies relating to these?
   c. Teacher utilisation of ICT resources and facilities such as blogs, wikis, pod casts, web-quests etc?
   d. Students’ opportunities to perform higher level thinking skills?
   e. Students’ metacognitive awareness?
   f. Teacher and student attitudes to virtual learning environment (VLE)?
   g. Collaborative relationships among and between teachers and students?
   h. Students’ sense of ownership of their learning?

5. *What aspects of the professional learning program have provided opportunities for teachers to encourage their students’ higher order thinking skills?*

6. *What aspects of the learning technologies have provided opportunities to encourage students’ higher order thinking skills?*
The evaluation used an interpretive methodology utilising a range of data generation methods, to build insight from multiple perspectives (teachers, students, and consultant). The principal evaluator worked from the start with the project director and the consultant. The Principal Investigator for the evaluation of the project, Dr. Gail Chittleborough attended the introductory session on 30th November 2006 and then briefed the research team about the project.

A Deakin Research Team member worked with teachers at each school but the overall evaluation was coordinated through frequent review meetings, and shared data analysis. Each researcher was allocated to one or two of the participating schools. Each researcher attended introductory meetings at their allocated schools and collected data as the project progressed. The research team attended the three-day professional learning summit. Each researcher followed the teachers’ progress by interviewing them about their implementation of the Web 2.0 technologies in their teaching. Some lessons were observed, students work was examined - including whilst students were working on their class portals. These data are reported in the Interim Report, under case Studies, (see Appendix D).

**Data Collection**

Data were collected at various stages of the project as indicated in the data collection schedule presented in Table 1. The four data sources used to build insight from multiple perspectives included:

- a. interview transcripts with students, teachers and consultant,
- b. analysis of website activity,
- c. participant observation at all professional development sessions,
- d. questionnaires- Pre-PD, Post-PD, Evaluation of PD.

The qualitative data from interviews transcripts and questionnaires were coded by at least two researchers and interpreted according to the research questions. Pseudonyms for teachers are used throughout the report. The Deakin team participated in the summit and meetings, progressively collecting data.

**Project Description**

Eight Schools were invited to participate in the project - 3 teachers from each school, preferably those who taught in the middle years. An Educational Consultant - Tom March (Sydney-based ICT consultant) an expert in ICT education - was appointed to deliver a
Professional Development (PD) program on ICT/Web 2.0 throughout the 2007 school year. The project was partly funded through AGQTP. The schools did not have to outlay monetary contributions. The selection of teachers to be involved in this project varied from school to school, depending upon their intrinsic and extrinsic motivation to participate in the project.

Table 1 Data Collection Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Stage of Project</th>
<th>Data Sources</th>
<th>Links to RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov, 06</td>
<td>Initial meeting about project</td>
<td>Observations</td>
<td>1</td>
</tr>
<tr>
<td>March, 07</td>
<td>Initial visits to six schools</td>
<td>Observations</td>
<td>1</td>
</tr>
<tr>
<td>April, 07</td>
<td>Interview Tom March</td>
<td>Interview</td>
<td>2</td>
</tr>
<tr>
<td>July 07</td>
<td>Attendance at 3 Day Summit</td>
<td>Observations</td>
<td>2,3</td>
</tr>
<tr>
<td></td>
<td>Collect questionnaires (pre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collect PD evaluations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 07</td>
<td>Interviews with participants in week 4 of Term 3</td>
<td>Interview</td>
<td>2,3,4</td>
</tr>
<tr>
<td>September 07</td>
<td>Meeting at AISV – follow-up to Interim report</td>
<td>Discussion</td>
<td>3, 5</td>
</tr>
<tr>
<td>October 07</td>
<td>October PD Day</td>
<td>Observations, Teachers’ reflections</td>
<td>2,3,4</td>
</tr>
<tr>
<td>July-December 07</td>
<td>Monitoring website</td>
<td>Teachers’ websites, Students work samples</td>
<td>2,3,4,5,6</td>
</tr>
<tr>
<td>December 08</td>
<td>Interview teachers</td>
<td>Interview</td>
<td>2,3,4,5,6</td>
</tr>
<tr>
<td>December 08</td>
<td>Collect students</td>
<td>Interview</td>
<td>2,3,4,5,6</td>
</tr>
<tr>
<td>July 08</td>
<td>Post-project- Attended follow-on PD at AISV</td>
<td>Observations</td>
<td>2,3,4,5,6</td>
</tr>
<tr>
<td>August 08</td>
<td>Post-project - Interview Tom March</td>
<td>Interview</td>
<td>5,6</td>
</tr>
</tbody>
</table>
Outline of the Project

30/11/06

Introductory visit

The Educational Consultant, (EC) introduced the concept to the participating schools at an introductory talk held at the AISV offices in South Yarra and presented the CEQ.ALL philosophy as a foundation for learning (http://tommarch.com/ceqall/). By combining the CEQ.ALL philosophy with Web 2.0 technologies the aim was to promote a pedagogically sound use of Web 2.0 technologies.

March 07

Visits to schools

The EC visited each of the 6 participating schools for initial meetings with the teacher participants. He elaborated on the pedagogical and technological aspects of the program during a 40 - 60 minute presentation. Again the CEQ.ALL framework was elaborated on along with the significance of optimism associated with:

• Intrinsic motivation
• Internalized critical thinking
• Scaffolded differentiated learning
• Academic optimism / culture

29/3/07

Feedback

The consultant followed up the introductory meetings with e-mail contact encouraging teachers to go to the web space – for the MyPlace project http://classportals.org/myplace/ and subscribing to the MyPlace Project website

2/7/07 - 4/7/07

The summit

The three-day professional learning summit for all participating teachers was held at AISV South Yarra facilities during the school holiday period. Representatives from the six participating schools were present, however not all participants were able to attend all sessions. The participants were provided with a CD, paper and online version of the resources by the Educational consultant. The PD resource scaffolded the teacher’s professional development, progressing from minimal, to intermediate and onto advanced participation. At each level, teachers were introduced to new technologies expanding their repertoire. The program was a workshop, incorporating hands on activities with all teachers working independently on their laptops in areas relevant to their own teaching area.

Over the three day period participants were introduced to social software resources from the educational consultant, EC’s website. A hard copy of the resources plus a CD was distributed to all participants. The teachers were able to work on their own class portals, blogs etc, with the EC assisting at both the technological and pedagogical level. The representation produced by the AISV Educational ICT Consultant aimed at clarifying the variety of tools available to teachers see Figure 1.

28/8/07

Feedback

In response to the lack of activity on the MyPlace website the EC requested feedback from the participants as to the preferred form of support – e.g. a workshop, school visit, online support via e-mail sent on 28/8/07

August–November

Classroom Implementation

Teachers implemented new weblogs in individual classroom situation and contexts.
Contacted the EC – e-mail
Classroom practise
Cases are reported in the interim report
Appropriated the web 2.0 technologies
Accessing resources on EC website

18/11/07  Professional Development Day

A follow-up session run by the EC provided teachers with time to collaborate and reflect. There was greater interest in each others work during this meeting. Teachers were encouraged to have their students participate in an evaluative final online activity (due on 19th November). Discussion topics included maintaining links into the following year, the difficulty in establishing successful online communities, addressing the big questions, raising money and purely intrinsic motivations.

Participants – Teachers, Students and Schools

Teachers

The project involved 13 teachers from eight well-resourced schools in the metropolitan area of Melbourne, Victoria (see Table 2). The teachers have access to a variety of current technological hardware and software including fast internet connections, IWB, digital camera, data projectors etc.

The selection of teachers to be involved in the project varied, for example at one particular school the group of three teachers explained that “We were told we had to do it”, but all others had volunteered. The small sample size (N=13) is presented as a group and individual case studies. Assertions are based on the data from the participants – in groups and individually, and are limited to these teachers. While the obligations and expectations of the attendees were outlined in detail at the introductory meetings there still seemed some confusion by some participants as to how the new Web 2.0 technologies would be manifested in the classrooms- evidenced by one teacher’s comment: “before the summit we were pretty unclear about what we were to be doing, but after the summit we were quite clear” (Hibiscus)

The number of participants fell over the duration of the project primarily due to a natural attrition. Some teachers finished their participation in the project in 2007; however, we extended the evaluation period to 2008, due to the slow uptake of the project. Some teachers did not complete the project because of changed responsibilities and situations in the school. By 2008 four teachers were no longer employed at the schools. The duration for each teacher is shown Table 2.

Students

The student cohort across all schools ranged from Year 5 to Year 11 and included a wide range of subject areas. This impelled the Educational Consultant to provide additional
resources to cater for all subject areas and age groups. Student work was examined via observations of the website activity and a focus group of six Year 7 students from Azalea school were interviewed about their experiences with new technologies in their science class.

**School Resources**

Observations conducted at the private schools involved in this project indicated that they are well-resourced and equipped schools that provide rich educational learning opportunities. The schools have invested in the current technologies, providing, for example, laptops for all staff, fast broadband connectivity, easy access to computers by students, interactive whiteboards in classrooms and established school intranet facilities that allow access to school sponsored software.

**Teachers ICT Skills, Confidence and Expectations**

Ten of the thirteen teachers expected that their participation in the project would develop their skills in how to use ICT, thereby increasing confidence enough to be able to incorporate the technologies in their own teaching, with only one teacher referring to Web 2.0 technologies, suggesting that the majority of the participating teachers were under the impression that they were involved in a PD program on general ICT. From this distinction it could be inferred that these teachers, at the beginning of the study, did not appreciate what was meant by “Web 2.0” technologies. This conclusion is based on the teachers’ initial written responses in the pre-questionnaire to the question: *What are your expectations of this project?* The teachers’ responses included:

- To develop greater confidence in the application of ICT in my classroom. To be exposed to and learn about new ICT.
- To extend the way I use IWBs in the classroom so students are constructing meaning and demonstrating THEIR understanding, rather than just viewing animations and other web-based material.
- Learn how to use technology to enhance my teaching and student’s learning.
- To learn new ways in which to integrate “exciting technology”/ways of using within my own teaching and classroom.
- To develop greater confidence in the use of ICT in the year 6 curriculum.
- That I will have a new way to use technology in my classroom.
- Collaborative knowledge sharing using ICT.
Table 2 Participating schools - teachers and extent of uptake of the ICT

<table>
<thead>
<tr>
<th>School + Gender mix</th>
<th>Number of staff</th>
<th>Teacher + Subject</th>
<th>Year levels</th>
<th>Mid-project Uptake * (1-5)</th>
<th>End Project Uptake *(1-5)</th>
<th>Duration in project</th>
<th>Classification (Trilling, 2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azalea Girls 3</td>
<td>3</td>
<td>Denise ICT/ Health</td>
<td>Year 11</td>
<td>2</td>
<td>2</td>
<td>Oct, 07</td>
<td>Early majority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deb Science</td>
<td>Year 7</td>
<td>4</td>
<td>5</td>
<td>Ongoing</td>
<td>Innovator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alice Primary</td>
<td>Year 6</td>
<td>1</td>
<td>2</td>
<td>Dec, 07</td>
<td>Early majority</td>
</tr>
<tr>
<td>Eucalyptus Mixed 2</td>
<td>2</td>
<td>Tris Science</td>
<td>Year 9</td>
<td>5</td>
<td>5+</td>
<td>Ongoing</td>
<td>Maverick</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F Humanities</td>
<td>Year 9</td>
<td>3</td>
<td>3</td>
<td>Aug, 07</td>
<td>Late Majority</td>
</tr>
<tr>
<td>Lavender Girls 3</td>
<td>3</td>
<td>B Primary/Technology</td>
<td>Year 6</td>
<td>3</td>
<td>NA**</td>
<td>Dec, 07</td>
<td>Early majority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J Primary/Technology</td>
<td>Year 6</td>
<td>3</td>
<td>3</td>
<td>Dec, 07</td>
<td>Early majority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J Primary</td>
<td>Year 5</td>
<td>2</td>
<td>3</td>
<td>Dec, 07</td>
<td>Early Adopter</td>
</tr>
<tr>
<td>Hibiscus Girls 3</td>
<td>3</td>
<td>Jackie Library</td>
<td>Year 7</td>
<td>3</td>
<td>5+</td>
<td>Ongoing</td>
<td>Maverick</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Margaret Outdoor Education</td>
<td>Year 9</td>
<td>3</td>
<td>NA**</td>
<td>Oct, 07</td>
<td>Late Majority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cally</td>
<td>Year 9</td>
<td>3</td>
<td>NA**</td>
<td>Oct, 07</td>
<td>Late Majority</td>
</tr>
<tr>
<td>Rose Mixed 1</td>
<td>1</td>
<td>Indira LOTE</td>
<td>Year 12</td>
<td>3</td>
<td>3</td>
<td>Oct, 07</td>
<td>Early Majority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LOTE</td>
<td>Year 10</td>
<td>1</td>
<td>2</td>
<td>Oct, 07</td>
<td>NA#</td>
</tr>
<tr>
<td>Banksia Girls 1</td>
<td>1</td>
<td>Deidre None</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>NA#</td>
</tr>
</tbody>
</table>

*Uptake – an assessment by the researcher on a scale of 1 to 5 with 1 being minimum and 5 advanced participation using a classification system developed by Trilling (2005).
**No longer working at the school
#NA not able to be assessed
+ Pseudonyms are used throughout this report
• To give me confidence in both myself and ICT in terms of my teaching goals. Is ICT really going to enhance my teaching / my students learning Am I going to understand the “ins and outs” to make it work?
• To gain a better understanding of how to apply Web2.0 technologies in a school setting.
• At this stage I have very little idea.
• To integrate ICT into my curriculum.
• To develop skills in the use of blogs and podcasts and class portals to create another platform of learning for our programs.

Teachers were surveyed about their experience with ICT in the classroom and their skills and at the beginning and end of the project (see Appendix A). The quantitative results are shown in Table 3. The results show that the teachers consider themselves to be capable and experienced with ICT, with 12/13 teachers agreeing or strongly agreeing with the item 3d I am generally effective in my use of ICT to my teaching and all participants agreeing that they use ICT to engage students’ interests (item 3h). This experience is evidenced by the teachers’ written responses to Q5a where teachers described their varied experiences with new technologies such as IWB, blogs, podcasting, bookmarking etc. All teachers agreed that they actively look for ways of incorporating ICT into their teaching (item 3b). The teachers written responses to questions in the pre-questionnaire provide corroborating evidence, for example:

• We have developed a library wiki with which has a number of pages for different groups in the library e.g. book club, writers club etc it has been introduced to students and some have started posting contributions. (Jackie)
• I have a Year 9 science unit running off a blog, again they can comment about their research. (Tris)
• My Year 11 IT students are using a blog to discuss exam preparation- currently they are using a blog on our intranet to share their experiences (over the holidays) in learning html. (Denise)

The teachers’ perceptions of their ICT skill level is slightly different to that of the educational consultant who was expecting all the participants to be at a higher skill level. In comparing the 2007 cohort with the teachers beginning a similar project in 2008, the
educational consultant confirmed that overall the teachers in the 2007 were at a lower starting level: “people in 2008 are looking far beyond than the dimension of the 2007 project because they are already there” (EC, Aug, 08).

Amongst the participants there was a diverse range of ICT experiences and abilities. So while teachers may have good IT skills some were not sufficiently adept to learn the needs of the Web 2.0 technologies easily. The educational consultant expanded on this saying that participants need “a good ICT base skill level, familiarity with web resources, and be using these things quite regularly.” (EC, Aug, 08). There was also ignorance about Web 2.0 technologies among some of the participants and a lack of understanding of the potential of Web 2.0 in an educational setting.

Most teachers identified improvements in their own skill level as a result of being involved in the project. Teachers responding to the post questionnaire identified many new technologies that they used as a direct result of the PD. Typical examples are wiki spaces, wordpress, jing, audacity, podcasting, scrapbook, del.icio.us, bubbleshare, animoto. They also identified skills that they learnt such as weblogging skills, embedding You-tube clips, and bookmarking.

Table 3 Results of the Teacher Pre-Questionnaire (N=13) and Post Questionnaire (N=5)

<table>
<thead>
<tr>
<th>My computer skills</th>
<th>Prior -project N=13</th>
<th>Post –project N=5+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD*</td>
<td>D</td>
</tr>
<tr>
<td>3a. I am confident in finding ways to use ICT in my teaching</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3b. I actively look for ways of incorporating ICT into my teaching</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>3c. I use new ICT related strategies with confidence that I can make them work,</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3d. I am generally effective in my use of ICT to my teaching</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>3e. I am able to answer student questions related to their ICT use,</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>3f. I am able to make productive suggestions to students using ICT in my classes,</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>3g. When a student has difficulty with their use of ICT I am able to help them,</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3h. I use ICT to engage students’ interests</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>3i. I use a range of ICT resources in the classroom</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*SD = Strongly Disagree, D = Disagree, N = Neutral  A = Agree and SA = Strongly Agree
+ Number of responses reduced- due to staff leaving, lack of completion of project, extended period to final evaluation
Table 3 Results of the Teacher Pre-Questionnaire (N=13) and Post Questionnaire (N=5)
(cont’d)

<table>
<thead>
<tr>
<th>Over the last term</th>
<th>Prior -project N=13</th>
<th>Post –project N=5+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>4a. I use e-mail</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>4b. I access the Internet</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>4c. I access blogs</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>4d. I download data</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4e. I use CD’s and DVD’s</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Over the last term</th>
<th>Prior -project N=13</th>
<th>Post –project N=5+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>4f. I use wikis</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>4g. I use bookmarks</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4h. I use online spaces</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4i. I use audio mp3 files</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

The Evaluation of the Professional Development Program

The Pedagogical Approach

Through the project, the EC aimed “to engage a good handful of teachers in an on-going project where they’ve been able to have their particular interests met on these new emerging technologies.” (EC Interview, 17/4/07). He hoped to be able to meet the needs of the teachers through a project based PD and gain some insight as to which technologies students respond to and are comfortable working with. In addition to teachers developing their skill level the consultant referred to “a shifting culture or characteristic rather than just a skill”. Attrition was the main problem envisaged by the EC. He had observed that the technological skill level of the teachers - varied and at the initial meetings recognised the teachers’ need for support.

The pedagogical power of the Web 2.0 technologies is still being explored and the EC modelled pedagogically sound uses of various applications. For example when describing the use of class portals he explains: “Ok here’s this amazing thing but from a publishing standpoint and view and it really is an open container and people bring to it both the good and the bad of what they’re already doing. So I’d look to use it as a fresh ability to do the student centred learning journey rather than just say, ok, use your blog to post your homework assignments.” EC (17/4/07). The EC used You-tube clips such as “Teenage Affluenza” to inspire and motivate. Similarly with the topic the Gold rush, the EC’s suggestion was to connect the historical context to current issues of the mining boom in WA.
These approaches are consistent with the philosophy of “rich, real and relevant” included in the MyPlace website. The pedagogical approach does not simply replace library books with online sources and DVD encyclopaedias. The project was not about the technology but rather about how to use the capabilities of the technologies to make students think.

**Introductory Meetings**

At each visit to school in March 2007, the EC gave a presentation, lasting approximately 45 minutes, to a small group of approximately 3 teachers who would be participating in the project. The opportunity for the participants to establish a relationship with the EC through meetings at their respective school could have been more effective. Some reasons that may have precluded effectiveness include:

- The teachers were in their teaching environment, being withdrawn and replaced from their teaching for the session by the EC,
- It was a passive session, with no hands-on opportunities, and a lot of discussion about pedagogy.
- The explanation of how the Web 2.0 technologies would be used was not clear, and the role of the new technologies in learning was not understood by some teachers.
- It repeated much of the information provided in November 06 meeting.

During the school visits the education consultant rarely met with school leaders. When interviewed he reflected that more recognition of the teachers participation and his presence at the school was needed. The leaders may then have communicated their support to the participants, “I think those teachers would have got more support if they had known that they were supported locally and that it was an important initiative – from the heads or deputies” (EC, Aug 08).

During the visits to schools some teachers indicated they did not fully appreciate the nature of the project. When interviewed in April 2007, the EC commented that some teachers were unsure about the PD or what was expected of them, “Often times, ... there was a little bit of, we didn’t even know how it was going and then you’d get these telling questions of, oh that’s alright, you know, like, I thought you were going to shove something down my throat or that I’d do something that I didn’t want to.” (EC 17/4/07). This suggests that some teachers did not have knowledge of what the project involved.
The Teachers' Evaluation of the Summit July 2-4 2007

Only Eucalyptus school had their portal established before the summit. Despite having access to the resources earlier, the participants generally had not started - probably because of time constraints and lack of confidence or expertise. The EC was disappointed with this lack of preparation. This indicated that there was a lack of communication in the initial meeting as to what was expected of the participants during the period from the initial meeting in March to the summit in July.

Teachers who were in attendance on the third and final day of the 3-day Professional Development Summit program completed the Professional Development Questionnaire (see Appendix B). The quantitative results are summarised in Table 4. All items except Items 2 and 3 have mean values of greater than or equal to 4.0 indicating that overall the participants agreed that the professional development (PD) program was of benefit to them. The participants agreed most strongly that the PD was relevant to their teaching (item 3, mean = 4.4), that their interest in the applications and resources of ICT had been stimulated by this unit (item 7, mean = 4.4) and the resources on the Internet have been useful to support their learning (item 12, mean = 4.5).

The responses regarding the consultant’s competence, attitude, behaviour and enthusiasm were extremely positive with means ranging from 4.7 to 4.8. This is supported with comments from interviews with several teachers being very complimentary of the EC saying that he responds quickly to e-mails addressing educational and technical issues.

Opinions of the suitability of the duration of the program were mixed with Item 3 The length of the PD is about right having a mean value of 3.0. In the written comments for this questionnaire, two respondents (Q3 c, f) proposed a shorter PD of 2 days duration; and 3 teachers requested the PD not to be held during the holidays (Q5 b, d, j). This was reiterated in an interview with Denise, a teacher from Azalea School who has good ICT skills and felt that the work at the summit could have been covered in half a day.

The mean for the responses to item 2 My attitude towards ICT has changed during this week was 2.8 with a bimodal distribution, indicating that for most of the teachers the instruction did not change their attitude to ICT. Despite this, the very positive responses to the other items indicate that the PD was appreciated and valued.
Table 4 Results of the Questionnaire for Evaluation of 3 day Professional Development  
(N=10)

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The professional development was well organized</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>41</td>
<td>41</td>
<td>4.1</td>
</tr>
<tr>
<td>2.</td>
<td>The workshops were interesting and well taught</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>41</td>
<td>41</td>
<td>4.1</td>
</tr>
<tr>
<td>3.</td>
<td>The length of the PD is about right.</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>30</td>
<td>3.0</td>
</tr>
<tr>
<td>4.</td>
<td>My attitude towards ICT has changed during this week</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>5.</td>
<td>The PD was relevant to my teaching</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>44</td>
<td>44</td>
<td>4.4</td>
</tr>
<tr>
<td>6.</td>
<td>The PD was successful in increasing my confidence to teach with ICT</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>40</td>
<td>4.0</td>
</tr>
<tr>
<td>7.</td>
<td>My interest in the applications and resources of ICT has been stimulated by this unit.</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>44</td>
<td>44</td>
<td>4.4</td>
</tr>
<tr>
<td>8.</td>
<td>I have been introduced to some new ideas about curriculum</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>42</td>
<td>42</td>
<td>4.2</td>
</tr>
<tr>
<td>9.</td>
<td>My ability to use applications of ICT has been stimulated by this unit.</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>41</td>
<td>41</td>
<td>4.1</td>
</tr>
<tr>
<td>10.</td>
<td>I have identified links between the use of ICT and the curriculum</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>43</td>
<td>4.3</td>
</tr>
<tr>
<td>11.</td>
<td>The balance between learning ICT skills, developing curriculum resources and exploring strategies for implementing ICT effectively has been appropriate.</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>40</td>
<td>4.0</td>
</tr>
<tr>
<td>12.</td>
<td>The resources on the Internet have useful to support my learning.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>45</td>
<td>45</td>
<td>4.5</td>
</tr>
<tr>
<td>13.</td>
<td>The PD session has motivated me to think about my teaching.</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>43</td>
<td>43</td>
<td>4.3</td>
</tr>
<tr>
<td>14.</td>
<td>I can describe methods of using ICT to provide opportunities to improve learning outcomes</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>43</td>
<td>43</td>
<td>4.3</td>
</tr>
<tr>
<td>15.</td>
<td>The consultant has displayed competence in teaching in the content area of ICT</td>
<td>2</td>
<td>8</td>
<td>48</td>
<td>48</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>The consultant’s attitude and behaviour towards me has encouraged my learning in this PD session</td>
<td>3</td>
<td>7</td>
<td>47</td>
<td>47</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>The consultant has been enthusiastic about teaching with ICT</td>
<td>2</td>
<td>8</td>
<td>48</td>
<td>48</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>The consultant has pitched delivery of the ICT skills at an appropriate level for me.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>43</td>
<td>43</td>
<td>4.3</td>
</tr>
</tbody>
</table>

*Strongly Disagree’ (SD), ‘Disagree’ (D), N- ‘Neutral’, ‘Agree’ (A) to ‘Strongly Agree’ (SA)
Online Resources

The MyPlace website (http://classportals.org/myplace/) designed by EC was an integral part of the professional development program. This site provided information, definitions and links to demonstrate the value of Web 2.0 technologies for example:

- Suggested pedagogies particularly those associated with Thinking Routines e.g. see-think-wonder, claim-support-question, watch-discuss-decide.
- Descriptions and resources on various teaching and learning philosophies including - Choice, Effort, Quality, Attitude, And Labour of Love (CEQ.ALL) and Rich, Real and Relevant (R,R,R).
- Instructions on “How To”…. such as blogs, webquests, podcasts, RSS feeds etc
- Modelled the use of inspirational objects e.g. You-tube clips, newspaper articles and the expected online communication.
- Links to web resources such as social bookmarking, wikis, pageflakes.

Figure 2 is a diagrammatic representation of the resources available on the Myspace website.
November Online Webquests

The EC designed a series of final evaluative online tasks that would challenge students – providing choice across subject areas. The overarching question “What can we REALLY DO to make the world a better place?” was posed with five themes so all groups could be catered for:

- **Budget: Dollars & Sense**
  How can we manage our money so we have enough to live, but some left to give?

- **Boom: Then and Now**
  What can we learn from the Aussie Gold Rush to better understand today’s growth of China?

- **Cells and Living Connections**
  How can an understanding of cells improve life on the planet?

- **Comparing Cultures: Fr/Oz**
  What can we learn from other cultures to help nations grow and prosper in a rapidly changing world?

- **Networking**
  How can networks and emerging technologies support humanity?  

Each theme had a You-tube clip to motivate, challenge and encourage students to address the posed questions and asked students for their opinions. The questions concerned social justice, values, technology embedded in the various subject areas – such as Science, French, the Gold Rush and was adaptable to a wide age range being suitable for the students involved in this project who ranged from Year 5 to Year 11. The webquest task was designed to promote higher order thinking such as evaluating, analysing and creating. The website included links to additional resources providing background information that students could access. Students selected one theme and responded online to the EC.

The website was a resource for teachers that showed how the technology could be used to encourage communication among themselves and their students (RQ2 and 3). The ongoing support by the EC was commended by many teachers and recognised as being critical to the successful implementation of the technologies. In response to the lack of activity on the MyPlace website the EC requested feedback from the participants as to the preferred form of support – e.g. a workshop, school visit, online support via e-mail sent on 28/8/07. This resulted in the workshop in October PD session.

On the webquest challenge, presented on the MyPlace website ([http://classportals.org/myplace/](http://classportals.org/myplace/)), the EC modelled ways of incorporating the technology (e.g.
blogs, webquests, You-tubes) with content (e.g. biology, gold rush etc) and with specific pedagogical intentions – in this case, promoting higher order thinking. This was a significant aspect of the professional learning program that provided teachers with opportunities to encourage their students’ higher order thinking skills (RQ 3).

The five focus areas identified to promote Thinking Skills: Higher-order thinking, Metacognitive awareness, Team work/ collaboration, Affect towards school / learning and Ownership of learning were addressed by various parts of the MyPlace website, see Table 5.

Table 5 Addressing Thinking Skills – support from the MyPlace website

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>MyPlace website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher-order thinking,</td>
<td>Examples using various Thinking Routines e.g see- think- wonder</td>
</tr>
<tr>
<td>Metacognitive awareness,</td>
<td>Learning to Look – probing, seeing questions</td>
</tr>
<tr>
<td>Team work/ collaboration,</td>
<td>Teachers were encouraged to use the CEQ.ALL framework that promotes student-</td>
</tr>
<tr>
<td>Affect towards school / learning</td>
<td>Promoting communication through common challenges e.g. the webquest on budget</td>
</tr>
<tr>
<td>Ownership of learning</td>
<td>- dollars and sense - had students from different schools communicating.</td>
</tr>
</tbody>
</table>

**Teachers’ Final Evaluation**

The teachers generally used blogs more as a result of being involved in the project, for example with their class. There was, however, minimal use of the MyPlace blog by the teachers with other teachers. This could be due to time constraints, no common interest, nothing to write or not willing to write in an open forum, inexperience, and lack of confidence. The teachers with high level ICT skills did not see any fruitfulness in posting on this blog, despite being prolific bloggers and the inexperienced teachers who might have been ignorant of the potential of blogging with peers, did not explore the capabilities. The responses shown in Table 6 indicate that for the limited sample of teachers, ICT did generally have a positive impact on the teaching and learning experience. The proposal aimed to develop a community of learners among the teachers and students however 4 out of the 5 teachers disagreed with the statement *I have had productive contacts with teachers from other schools as a result of my involvement in the project* (Table 6, item 6). Considering that Web 2.0 is focused on the online community, resources and networking, this omission is fundamental. Some results vary corresponding to particular school situations, for example,
the amount of sharing of ICT strategies (item 1c). Teachers provided feedback as to the factors that hindered the effectiveness of the project including:

- Lack of general staff knowledge.
- Lack of direct relevance to curriculum offerings at our school.
- Fitting the project into an already crowded curriculum.
- Logistical limitations – while all classes could access the class portal only one could access the blog.
- Lack of timely technical support from the school.
- Meeting common assessment requirements – disadvantaging students involved in the project; ideally students would be tested differently - more authentically.
- Year level taught and time shortage.

Table 6 Responses to Final Questionnaire – Impact of the Project N=5

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. My use of ICT has increased as a result of the project</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1b. My students learn better as a result of the project</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1c. There is increased sharing of ICT based teaching strategies in</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>our school as a result of the project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1d. I have had productive contacts with teachers from other schools</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2a. Increasing the profile of ICT based teaching strategies in the</td>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b. Improving the organisation and planning of curriculum in the</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2c. Improving the way technologies are integrated into my teaching</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2d. Improving processes for assessing students’ learning</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2e. Increasing teachers’ enjoyment of teaching</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2f. Improving learning outcomes for students</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2g. Improving ICT learning outcomes for students</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2h. Improving students’ attitude to learning</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2i. Improving students’ attitude to ICT</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The number of responses to the post questionnaire is disappointingly low. Despite the fact that the number of participants fell over the period of the project, an additional reason for this might have been the multiple evaluations that participants were asked to complete – one
by the educational consultant, one by AISV and one by the Deakin University team resulting in the teachers being “over-evaluated”.

**Evaluation of the Digital Community**

There is a range from minimum to high involvement on the MyPlace website as summarised in Table 7. There is evidence of the creation of class portals, blogging, podcasting, and some limited communication across three class portals.

**Class Portals**

As a result of experiencing the training in the use of Web 2.0 technologies teachers utilised the technologies in their teaching in a variety of ways. Most teachers established web-portals that provided them with an online presence (see Table 7). The web portal can include components such as:

- A blog - where stimulus material could be exhibited, questions posed, challenges set and students could make comments to respond to the teachers posts.
- Content and information pages with links to other sites, instructions, worksheets etc.
- Visual stimuli material including animations, images and You-tube clips.
- RSS feeds.
- Social bookmarking.
- Podcasting.

The above components are the tools that the teacher brings to create an interesting online learning environment, but more importantly, it helps them establish a community of learners and invites them to respond and interact with each other. Traditionally the web has been used by teachers as a source of information, but with Web 2.0, teachers and students still access information on the web, but more significant is the interaction with other people online, remixing information and responding with text, images and podcasts. The low level of interaction with some classes was disappointing because the capabilities of the Web2.0 technologies were not explored. The results show that 10 out of 13 participants failed to maximise the use of Web 2.0 technologies.

**Blogging**

Teachers have used the blog as a source of information, to invite comment, provide links to worksheets, and provide links to motivating websites. Visual and audio stimuli are
used to complement text. The teachers’ use of the blog varied according to its appropriateness for the particular topic being taught. Students responded eagerly to some teachers’ requests, challenges or questions, for example searching the web for good links that provided answers to questions. One teacher has a useful set of guidelines for students for the protocols of blogging (see Appendix C).

The potential of the social space software for education was intimated by EC in his introductory talk. The EC anticipated communication among teachers flowing on to communication between student groups and for this to happen alongside the expansion of new technologies. The results were mixed. Students from Azalea school- used the blog mainly for homework questions. Students commented on the advantages of blogging:

*If you are in the classroom many people could talk at once. But you are doing it here and you only hear, see or pick what you want to listen to.*

*It is easier to understand, sometimes it becomes clearer.*

*Sometimes it is clearer when they write it down.*

*It was good because you think about when you go home. It is something to think about and when you find it, when it is a good answer or something you can add it on, you can add it straight away don't have to keep it and wait to the next day.*

Int: *Did you read their comments did that make you think?*

S3 *Yes, and also it is good to see like, the different points of view, like one person might have one comment whereas another person might add to that comment, to say something extra.*

The teacher, Deb, encouraged students to post questions on the blog as a means of managing dominant class members. She appreciates that the blog can provide an alternative learning forum:

*“Students that struggle with Science have found they can fully participate as questions, comments on blogs are their opinions. They have a chance to think before they respond, read other people’s comments- so they are able to give a more considered opinion or explanation than is possible during a lesson.”* (Deb)

Some students tended to be very uncertain about their postings and minimum requirements were - met by those students. Blogging as a school task may be viewed differently by some students – aware that their postings are overseen with implications of assessment, conventions of language and not willing to risk criticism by peers or the wider community.
Online Communication Among the Participants

The educational consultant expressed initial frustration with - “the difference between what we advertised as the goal and what really materialised”. He was disappointed that there were few times during the project when students were really connected. The online communication hoped for among the students and teachers from the participating schools had not occurred before the professional development day in October 2007. However, the webquest challenge provided a common task across the schools and did result in some communication among three participating schools. In response to the question Can you name the best $100 you have ever spent? one teacher, Deb, provided an inspirational account of how during a visit to Cambodia they supported a Cambodian family by paying for the building of a well. This story fostered communication among the students from different schools, giving the students a reason to blog. An example of one student’s post is shown in Figure 3.

WE DARE YOU

After our Library teacher read us Tom’s post (see Here’s a Friendly Challenge (“What can we do to make the world a better place?”…)) Our school has decided to get our act together and raise some money to buy a beneficial gift for the people in a third world country. We are still to decide what and to whom our gift will go to, but we will assure it does reach our chosen place.

So many different ideas for fundraisers have been thrown around and are really dead set on getting this up and going.

We’ve taken on the challenge….can you?

Figure 3 Sample of a weblog
Table 7 Summary of each class portal on the MyPlace website

<table>
<thead>
<tr>
<th>Class Portal</th>
<th>Level of participation*</th>
<th>Class Portal</th>
<th>Use of blogs</th>
<th>RSS feeds</th>
<th>Consistency</th>
</tr>
</thead>
</table>
| 7C Tut       | Minimal                 | 2 pages – with You-tube links  
• Puberty  
• Leaders | One set-up but no responses | No | None |
| Changing States | Intermediate | 7 pages-  
• home,  
• games, tutorials and revision (11 links),  
• extension activities (4 links)  
• just for fun (feed-fish)  
• handouts (6 links to website and notes)  
• dry-ice experiments (4 links +2 u-tubes)  
• other science sites (2-links) | Question posed - 23 responses | no | Good |
| Forces       | Intermediate | 4 pages  
• home – spiders, fish- fun, 3 u-tubes for interest/motivation  
• eggscellent- photos of activity, plus worksheet  
• force links (13 links )  
• games and tutorials (4links)  
• revision (5 links)  
• videos  
• vote for your favourite scientist | Yes- | no | Good |
| CUE007       | Intermediate | 7 pages  
• home  
• Australia  
• China  
• Fiji  
• Thailand and Laos  
• Vietnam | Multiple responses to multiple postings | No | Good |
| History/Geog | Minimal | 4 pages – still under construction | None | No | No |
| Mr B’s Life Learning | Advanced | Weblog  
5 pages  
• Sports science  
• Nuclear war  
• Life on another planet etc  
• Blast off | Yes- multiple comments on multiple postings | Yes | Yes |
| Mr B’s blog | - 66,110 hits  
Daily posts of fascinating scientific trivia? | None | No | No |
<p>| Year 5D Body | Minimum | 3 posts | No comments | No | No |</p>
<table>
<thead>
<tr>
<th>Class Portal</th>
<th>Level of participation</th>
<th>Class Portal Use of blogs</th>
<th>RSS feeds</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>6D Robotics</td>
<td>Intermediate</td>
<td>4 pages • blog with links to files and websites • China • Fun things • Webquest worksheet</td>
<td>Comments from students</td>
<td>Good</td>
</tr>
<tr>
<td>6R Rapping Robots</td>
<td>Minimum-Intermediate</td>
<td>• Weblog blog with links to files and websites • 17 postings</td>
<td>No responses from students</td>
<td>Fair</td>
</tr>
<tr>
<td>Identite Francaise</td>
<td>Intermediate</td>
<td>5 pages: • A quoi sert ce site? • L’identité française: une introduction • Metisse • La Haine With links on the blog to websites and files</td>
<td>Blogs- with 5 comments</td>
<td>Fair</td>
</tr>
<tr>
<td>Lucacept - Intercepting the Web</td>
<td>Advanced</td>
<td>Daily posts – excellent community of interested bloggers responding to posts. - on technology, education, literature.</td>
<td>Links to <a href="http://globallycool.ning.com/profile/JackieLuca">http://globallycool.ning.com/profile/JackieLuca</a></td>
<td>Yes Good</td>
</tr>
</tbody>
</table>

(*Classification based on the description – in the summit workshop handbook)

As a result of this challenge monies were raised for charity (http://Tommarch.com/budget/). While the technology allowed students to communicate easily on the common task, the technology alone is powerless without a context and purpose for the communication. Without motivation, interest and challenge there was no reason for the communication. The technologies may provide the potential platform for communication and learning however the pedagogies provide insight into the components necessary to promote communication.

Online Communication – Beyond the Project

The capacity of Web 2.0 technologies easily allows digital global communication. Two teachers in the project, Tris and Jackie were active in global web communities directly as a result of their participation in this project. Tris currently has a weblog with over 66,000 hits (http://mrbarlow.wordpress.com/). He posts snippets of fascinating scientific articles. He shares his podcasts through You-tube and podcast hosting. Jackie has an equally impressive weblog (over 17,000 hits) with daily posts – communication with other teachers, educators and students with rich and thought provoking discussions (http://jackielu.wordpress.com/).
These two teachers have made good use of the technology - posting, using RSS feeds, tags, twitter etc to remix and recreate information. By being willing to share their thoughts on the web, they get feedback and hear and see other people’s ideas. They are modelling being active learners; their personal development is visible through their blog.

**Case studies**

As the project progressed there was growing diversity among the teachers’ interest and uptake. The Innovation Learning Curve proposed by Trilling (2005)(see Figure 4) is used to categorise the teachers. The assessment by the researchers presented in Table 2 is based on the available data from the project in relation to the participant’s abilities to access, utilise and create technologies.

Three teachers – Tris, Jackie and Deb are presented as exemplary examples of teachers implementing the aims of the project.

![Up and Over the Learning-with-ICT Curve](image)

*Figure 4 Descriptors of the use of technologies from “Disconnected” to “Maverick” proposed by Trilling (2005, p. 2)*
Tris

Tris, a secondary science teacher was the only one to set up his weblog before the initial summit. He mastered the software setting up various weblogs for his classes well before the other participants. He worked primarily alone, adapting the technology to his science lessons and the Year 9 Community, Urban Environment (CUE). An excerpt from an interview with Tris, describing his efforts:

|So what I did, was made a web page called [Lifelong Learning], which is a year nine project and a big part of it was giving students a choice, they had a choice of simple things to learn about, to explore. They were posing big questions and the idea was that they would kind of follow the path which interested the most and that was sport science and they could choose space travel and know how we get into space and sorts of things like that, and interstellar travel and blast up was one if the earth was about to undergo some catastrophic event then how would we get to another planet to keep human race alive.|

That was the unstructured part, I suppose. But it was still complemented by some homework tasks so if they had some homework tasks which were the questions out of their text books which were basically very structured, I suppose, as opposed to unstructured bits. But it was science and I still did a practical component. I find it important for students to still do some hands on things. So it's all done in class portals [how does that sound?]

Tris was reflective about the teaching of the unit commenting on students’ development:

- I generally acted as a facilitator during the unit as all students were engaged in different topics. It didn't happen all the time and not all students experienced it but I do feel that many experienced Csikszentmihalyi's "Flow" at times which was fantastic.
- Students presented their learning this term and I was very happy with the results. On several occasions during the students’ final presentations I learnt things from the students that I didn't know before - clearly I hadn't told them - so that was great.
- I do feel that students were still extrinsically motivated by marks, however, there was also some intrinsic "need to know" going on too.

Tris identified the value of the CEQ.ALL framework: “I embraced the choice and feel the rest will flow from that”. He was thoughtful about the benefits of the technology to students’ learning. He set up a weblog for all students outside the project, promoting current news articles in Science and reached a wider audience: “I feel that I never achieved 100% learning purely and simply for the sake of learning. The problem probably lies in the fact that
assessment and reporting are such a big focus at schools. So in an attempt to help my students love learning and want to learn I set up another site which is my blog of interesting things going on around the world. I have given the site to the 80 kids I teach this year and in eight weeks this term since its introduction it has got about 1500 hits. So I feel it is somewhat successful at helping kids want to learn and as such I plan on keeping it going”. This site has grown and now has a hit measure of 66,000. While he posts almost daily, there is only occasional feedback. In addition Tris - made numerous podcasts on Biology topics and for the CUE program. The EC commented on Tris’s changing expertise: “look at what he’s done with the students, on itunes where he has 300 odd through i tunes. He teachers over 20 students, but there are over 300 students downloading it every week, so in fact he is teaching these other students. So that I think shows the extension of the teacher in the classroom”

Developing new technological skills and gaining an identity as an expert in this area has given Tris a new role and persona in the school. As Tris’s confidence has grown he is more willing to share and provide his expert help to others and now in 2008 he is leading three other teachers in weblog development for the Year 9 CUE experiential learning experiences at his school. The technology has a purpose and is appropriate for students’ and teachers’ communications about before, during and after their school field trips.

In February 2008, Tris’s blog was featured on a TV program in the US - after a student informed them of Tris’s challenge to get 10,000 hits before the end of term. Figure 5 is a comment by Tris on his weblog – which has a You -tube clip of the event on US television. This really shows the powerful nature of the blog.

<table>
<thead>
<tr>
<th>I’m famous and “a neat guy”</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is this technology based TV show called ‘The Lab with Leo Laporte’, <a href="http://mrbarlow.wordpress.com/2008/02/13/im-famous-and-a-neat-guy/">this is</a> the shows web site and <a href="http://www.youtube.com/watch?v=3I61jLZN9RU&amp;eurl=http://mrbarlow.wordpress.com/2008/02/13/im-famous-and-a-neat-guy/">here is</a> the shows wikipedia page.</td>
</tr>
<tr>
<td>And guess what … <a href="http://www.youtube.com/watch?v=3I61jLZN9RU&amp;eurl=http://mrbarlow.wordpress.com/2008/02/13/im-famous-and-a-neat-guy/">Mr. Weblog</a> was featured on it. Episode 147 check it out:</td>
</tr>
</tbody>
</table>

*Figure 5 An excerpt from Tris’s blog*
Jackie

Jackie teaches in a girl’s school where all students are note book users from Year 5. The environment is well resourced and fully networked with wireless access and Blackboard intranet. Jackie’s story illustrates the importance of giving teachers opportunities and time to take up new ideas, in this case Web 2.0 technologies. It also shows an extraordinary level of commitment and passion and how this impacts on student learning.

When asked about issues impacting on the MyPlace project, time was a major factor with the school’s prescribed curriculum needing to take precedence. The project was an “add on” rather than embedded within the existing curriculum. Jackie’s role within the school as teacher librarian posed further challenges. Initially she planned to have her class portal operating and then introduce the students in her tutorial group to it with YouTube videos embedded. She did begin with the Teenage Affluenza video and one of the thinking tasks that went with it. It promoted a lot of discussion and its success could in part be gauged by the way in which students’ interest and thinking were stimulated. Many students showed the material to their parents and this resulted in positive feedback from parents with comments such as, “every child in Victoria should see this”. This video was also used in the library after mention was made to a class and students wanted to view it. She described how she could see the real potential for it but faced the challenge of finding the time to build it into something when she may only have the students for a half hour tutorial per week.

When asked about the students’ use of blogs at the beginning of the project, Jackie and other teachers had thought that the students would be confident users. However, even though the informality of the writing tasks had been explained, students tended to be very uncertain about their postings, they were quite conscious that their postings would be overseen. Even though writing conventions had not been stipulated they attended to the normal conventions of language in contrast to how they would normally communicate in such an environment, using short forms for example. It was felt that this was also in part due to the fact that it was a school task. Students made sure that they met minimum requirements rather than “running” with it.

At the end of the school year it was evident that changes had occurred with regard to students’ attitudes and confidence in using web 2.0 technologies to enhance their learning. The group of students was observed during a visit to Melbourne in late November 2007. They
had been encouraged to develop their own inquiry question based on that developed by their teachers: “Is the city just a city?” The students posed the question: “Melbourne beautiful one day, what happens next?” The girls planned visits to various locations looking for contrasts to photograph: the aquarium beautiful, discarded bicycles and seats in the shallows of the Yarra River ugly. Their thinking went beyond physical contrasts to the social, the casino complex and problem gambling. A wiki was created for the girls to communicate their ideas. Jackie was keen to make more use of this technology and saw a major issue as one of confidence. The girls’ enthusiasm was quite evident and it was clear that they had a sense of ownership of the project.

By February 2008, Jackie was working with teachers at her school on the use of wikis and discussing with teachers how blogs could be used to support learning programs. She had also commenced work on her own blog using wordpress and was writing about Web 2.0 and how teachers can use new technologies to support learning. Jackie’s blog shows the growth of her own use of Web 2.0 technologies.

“I’m constantly amazed by the changes I have seen in myself over the last two and a bit years. …. As I’ve become more familiar with technology, I’ve noticed a shift in my reading habits. I’m a Teacher-Librarian and English teacher, and have a deep love of the written word. I love eloquent, simple language that can evoke feeling and move me in some way. I love being so completely immersed in a novel that it transcends all else and I can do nothing but turn the pages. I love sharing the reading experience with my students. But I’ve noticed a change in my reading habits.”

“As I’ve developed my interest in what is possible with the Web, my love affair with the novel has waned. Maybe it’s just that I’m reading the wrong books, but I’m finding it more difficult to become engaged and commit the time needed to complete a novel. Two years ago I felt overwhelmed by the wealth of information flooding from the Web; today, not so much. I think this is because the type of reading I am doing has changed. An essential part of my reading today is via my Google Reader. Here I access the latest feeds from people who write blogs that are of interest to me. Most of these are people involved in education from various corners of the world. These people are filtering the information overload that is the Web for me, and I, in turn, am doing my bit by writing this blog and adding to the filtering process. By being part of this community I am helping to manage my own professional development and hopefully am assisting other people with theirs”
Jackie’s blog resulted in her forming an extensive network of fellow educators using these technologies to enhance student learning. (Jackie’s map shows over 8 000 visits between February 2, 2008 and August 18, 2008.). Evidence of the power of the network and the technologies for student learning is exemplified by a global cooling project a group of her students completed in their own time (as it was outside the year level’s curriculum). It began through linking students, teachers and principals from Korea and the USA and Jackie’s school. It culminated in a concert which was organised one weekend late in April 2008 to raise awareness and involved thirty-two students over a period of eight weeks.

Jackie’s immersion in Web 2.0 technologies continues and her comments at the end of August 2008 saw her reflecting on the future direction of education, following a visit to the school from Sheryl Nussbaum-Beach. Sheryl is one of the educators running the professional development program, Powerful Learning Practice (PLP) which will be running at Jackie’s school. Jackie supplied a quote from the PLP website which encapsulates her own continuing journey: “Powerful Learning Practice offers a unique opportunity for educators to participate in a long-term, job-embedded professional development program that immerses them in 21st Century learning environments. The PLP model is currently enabling hundreds of educators around the country to experience the transformative potential of social Web tools to build global learning communities and re-envision their own personal learning practice.”

Deb

Initially Deb - made a class portal specifically to teach the topic of Forces to her Year 7 class (24 students). She described her teaching as being in a rut - teaching forces in a didactic and traditional way- so she used this project to explore a more constructivist approach. Deb wanted a site that was fun and motivating but not gimmicky. The portal has various pages. For example, interactive games, assignments, revision, “eggcellent” activity etc.

Deb was very impressed with the difference that the portal had made to her class. She commented that the interface was more connected to the students’ experiences and provided excellent stimulus resulting in rich student conversations. Her students generated their own definitions, requiring higher order thinking which the more traditional didactic approach did not.
When interviewed students from Deb’s class commented on using the technologies for their learning:

“I guess having all those links and stuff and watching animations like helped us learn and helped us revise for the test.”

“yes, because when we use pictures, but with the animations they are sort of easier to look, understand.”

Deb had good discussion about science topics among the students in her class on the blog. Deb preferred the rich, real and relevant framework to the CEQ.ALL as a philosophical foundation. She commented on how the project - had a ripple effect – students were working at deeper levels. Deb reported the following changes to her pedagogical approach:

- Used short clips that go for 5 minutes, like from You-tube rather than videos that go for half an hour.
- Used the blog as an additional forum - that helped manage students’ questions in class.
- Gave students - much more choice and opportunity to direct the curriculum.
- Posted questions on the blog that could be addressed at a number of levels, allowing all students the opportunity to respond.
- Provided students with - greater flexibility to access the Internet for class notes at anytime.

Deb extended the approach to other Science topics in 2007, and now in 2008 is leading all Year 7 teachers in developing web based frameworks for all units. The teachers are having instruction from the EC to help with this. Deb gained recognition from her school leaders for the work that she was participating in, with it being included in her annual professional review.

**Identifying Change**

**Change in Teaching Practice**

Teachers’ perceptions of changes in their practice were investigated in the post questionnaire. The summarised results reveal the individual nature and the unique impact of the PD on each teacher. See Table 8.
Table 8 Summary of teacher response to the impact of PD on their teaching

<table>
<thead>
<tr>
<th>Teachers’ comments</th>
<th>Impact on teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>My presence outside the classroom has increased.</td>
<td>Increased confidence, self-efficacy</td>
</tr>
<tr>
<td>More open to using online spaces for collaborative group projects</td>
<td>New teaching approach</td>
</tr>
<tr>
<td>Use of YouTube as a ‘hook’ for student engagement in a task</td>
<td>New stimulus material</td>
</tr>
<tr>
<td>Feel that my students are contributing more to the curriculum so I have felt that some of the content in the 3 topics I have done with my Year 7’s is not as important as providing challenging questions and thought provoking stimulus material.</td>
<td>More inclusive of students</td>
</tr>
<tr>
<td>I feel less that I have to know the answer to every question—that we are learning together more, rather than them relying on me as much.</td>
<td>Building teamwork between students and teacher</td>
</tr>
<tr>
<td>Feel that the way I teach is reinvigorated—I am teaching the same topics as in previous years but in a much more interesting and varied way</td>
<td>New, interesting teaching methods</td>
</tr>
<tr>
<td>Increasing awareness of ways to integrate ICT</td>
<td>Increased pedagogical/technological knowledge</td>
</tr>
<tr>
<td>I have increase in students engagement in real world learning</td>
<td>Real</td>
</tr>
<tr>
<td>My students are thinking more for themselves and are prepared to look at bigger issues, beyond the current topic we are studying.</td>
<td>Promoting thinking skills and metacognition</td>
</tr>
</tbody>
</table>

Change in Student Learning

Evidence of how the Web 2.0 technologies use can change and improve student learning was provided by the teachers on the post questionnaire. Teachers incorporated the Web 2.0 technologies to provide opportunities for: engagement, choice, creativity, participation, receiving feedback, flexibility, and collaboration to provide learning opportunities. The responses are categorized in Table 9:

Students themselves recognised changes, in their comments in the focus group interviews about accessing information on Internet and Intranet:

S1 You can look at it anytime you want to. [3]
S2 You can look at what you are more interested in, as well [2]

33
S2 You can look at other sites for revision. [2]

S3 It can take you to different sections that you may want to look at and that also has links to other sites. [3].

Table 9 Teachers comments providing evidence of the use of the Web 2.0 technologies and the impact on student learning

<table>
<thead>
<tr>
<th>Teachers Comments</th>
<th>Impact on Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anecdotal student feedback on increasing their engagement (Tris).</td>
<td>Engagement</td>
</tr>
<tr>
<td>Engagement, interest, suits students varying learning styles (Alice)</td>
<td>Engagement and Choice</td>
</tr>
<tr>
<td>They enjoy trying new things and are fascinated with what is possible. At our school I created a wikispace for our Year 7 &amp; inquiry week. Students created pages in this space to indicate their planning, evidence collection and reflection. It was successful with most but not all students. (Jackie)</td>
<td>Creativity</td>
</tr>
<tr>
<td>Students that struggle with Science have found they can fully participate as questions; comments on blogs are their opinions. They have a chance to think before they respond, read other people’s comments- so they are able to give a more considered opinion or explanation than is possible during a lesson. (Deb)</td>
<td>Participation and Receiving Feedback</td>
</tr>
<tr>
<td>Students feel that their questions can be answered straight away- don’t have to wait until the next class (Deb)</td>
<td>Flexibility</td>
</tr>
<tr>
<td>Students really enjoy collaborating in their learning and are empowered to contribute to what we study. (Deb)</td>
<td>Collaboration</td>
</tr>
</tbody>
</table>

Evaluation of Teaching Approaches and Philosophies

**Choice, Effort, Quality, Attitude, and Labour of Love (CEQ.ALL)**

The primary theoretical framework, proposed by the educational consultant to underpin the pedagogies and the technologies includes five components - Choice, Effort, Quality, Attitude, and Labour of Love (CEQ.ALL)(March, 2006). A rubric giving an interpretation of CEQ.ALL identities is in Appendix G. This framework was a powerful foundation for some teachers; others preferred the *rich, real and relevant* framework, while others felt that it was superfluous as they had existing teaching philosophies.

The EC reflected that most teachers identify with the CEQ.ALL framework, “*it seems to be the expectation that students put in the effort and the choice - it is very obvious but spelling it out likes that seems to change the way people think about it but it takes sustained*
emphasis. This is a subtle yet significant pedagogical aspect that can be significant to the success of an intervention.

Tris, a teacher at Eucalyptus school felt that the project “had really intrinsically motivated students to want to do well” because “students had discovered things that they did not know and on occasions at least 50% of the students experienced the flow of wanting to know… this reflected on the final presentation of the project work which was generally excellent and better than any other work I had seen in the previous years”. Tris noted that the CEQ.ALL framework worked very well, particularly the Choice component as “all students embraced it with enthusiasm”. Deb from Azalea school commented on the impact of students exercising their choice “they (students) can take things off on a different tangent; they can post a You-tube video or a comment that deviates away from what we are studying in class that day and go down a different track.” Her students confirmed this with comments like “You could choose what you wanted to do, not to have to do everything.” Choice can be limited by the some schools restricting students’ direct access to the Internet.

Indira confirmed that the CEQ.ALL framework was consistent with her own personal teaching philosophy “I think that’s been my philosophy forever... but I’m not sure it’s changed.” B and J, team teachers from Lavender school were both supportive of the CEQ.ALL framework reporting “I like the CEQ.ALL; It’s given us new ideas”. Jackie, didn’t see the CEQ.ALL framework as having an impact. Denise and Alice felt the CEQ.ALL framework was superfluous as - each already held a similar philosophy.

**Five Thinking Focus Areas**

The project was dependent on the teachers using technologies to provide opportunities for the development of students’ thinking skills. Examples of teachers intentionally directing students’ learning of thinking skills, specifically in the five characteristics: *Higher-order thinking, Metacognitive awareness, Team work/ collaboration, Affect towards school / learning and Ownership of learning* are reported here.

**Higher Order Thinking**

The MyPlace website describes and models various thinking routines that can promote higher-order thinking. These were used by some teachers. One Year 6 teacher explained “we did ‘See, Think, Wonder’ activities and we explicitly taught Thinking Skills ...
used them during numeracy, literacy activities and so on ... the children love it and they have produced some great work”.

To promote higher order thinking Tris used the technologies to provide choice that fostered motivation and interest. The questions set challenges within boundaries and students had the capacity to answer - with the web as the source of information, thereby giving students greater control and ownership of the task. Tris described the work of his Year 9 students as in the higher order range of thinking – “the projects the students created were certainly at the top end of Bloom's revised taxonomy. i.e. Analysing, Evaluating and Creating. So it was terrific in this regard.”

One key way the technology was used to promote higher order thinking, was to pose questions based on visual and audio stimulus material. Students were asked about how the online resources they used could help them learn. One student described the task: “[Our teacher] says something such as "look at this animation and comment on what you think of it" it is much more thinking, you need to think a lot more than if you had to read it and then say what it was. Because you have the answer written in and you wouldn’t be thinking, you would be finding it and writing it again”. Higher order thinking skills include creating, evaluating and analysing (Atherton, 2002) and pedagogies that promote these skills are varied but include challenging the learner, promoting active participation, argumentation, problem solving, conducting investigations and tackling subject matter that is complex (Tytler, 2004).

Deb and Tris both used pictures on the blog and asked for students to respond to questions they posed. The responses and interaction, often led to students doing their own research. An example is shown in Figure 6 from Tris’s Year 9 class website. It shows the questions that are posed about Nuclear energy to promote higher order thinking.

Examples of pedagogies that can provide opportunities for higher order thinking in this project include:

- setting challenges and posing big questions that require analysing and evaluation.
- encouraging students to respond sharing opinions ideas and research.
- using thinking routines and thinking frameworks to promote thinking e.g. concept maps, PMI, thinking hats and thinker keys.
- including reflective tasks.
- pushing students outside their comfort zone
- providing good stimulus material such as animations, video clips, podcasts.
**Metacognitive Awareness**

Direct evidence of metacognition is sparse, but it should be remembered that it is difficult to ascertain metacognition without in-depth interviews. Indirect evidence of students referring to their own learning has been recorded. One such example is in the use of technology such as videos, animations and simulations. Deb made use of numerous animations to explain scientific concepts e.g. the particulate nature of matter. When a focus group of students was asked about the value of animations to their learning, one student responded: “If she (teacher) says something such as "look at this animations and comment on what you think of it" it is much more thinking, you need to think a lot more than if you had to read it and then say what it was. Because you have the answer written in and you wouldn't be thinking, you would be finding it and writing it again.” (Year 7 student). Here the student is recognising the difference of rewriting text to constructing their own understanding. This demonstrates the student’s awareness of his/her own learning.

**Team work / collaboration**

Evidence of teamwork / collaboration between the students from the participating schools occurred only in November in response to the Webquest activity as described in Online Communication among the participants. Collaboration among the teachers was slow to develop, however, there are examples of collaboration after the October PD. In addition, collaboration and teamwork occurred within teachers’ own classes.

**Affect towards school / learning**

The case studies provide examples of students developing a positive and active interest in their learning. Tris’s website promoted an interest in science as discussed in his case study. An example from Deb’s class, is her use of the web to promote interest in comets. She posed the question: *This is a comet. Find out what a comet's tail is made from.* While this question may not be a higher order question, it still promotes the use of scientific language, and sense making. In response, the students researched communicated, and shared information. See Figure 7 and 8. In this example the students are in the same class and know each other. The blog provides a forum for students to view, hear and read information, voice their ideas, and receive feedback.
Nuclear War
Wednesday, March 7th, 2007

It has finally happened …. NUCLEAR WAR !!!

Australia will be one of the last countries to be affected but the radiation will come, we will die … Unless, unless we can do the impossible - move underground. As a young Australian who has grown up in the ‘information age’ you have been selected to be a part of the team to get as many citizens underground as you can. There is lots to think about but time is running out. You need to start improving your knowledge so you can make some decisions - start thinking about:

- How do nuclear weapons work, who discovered them and why?
- Where should we dig and how will tectonic plates affect us.
- Find out more about Australia’s Geology.
- Radiation - Alpha, Beta, Gamma.
- What engineering challenges does living underground provide - is Zion from the Matrix movies possible - what about housing in Coober Pedy?
- What is the temperature underground and should we use heat from the Earth’s core?
- Getting energy: Respiration and Photosynthesis.

Of course this is only a start, what else do you think we need to know?

Figure 6 Excerpt from Year 9 Lifelong Learner Portal
Ownership of learning

Teachers included *choice* as a critical component of many tasks – thus providing students with some ownership of their own learning. Ownership has proved a powerful aspect to promote intrinsic motivation and foster students’ learning. This has included having students recognise and acknowledge that they are being given a choice and therefore ownership of their learning. A response by a student in the focus interviews, exemplifies this:

Student: *If you need to do a specific thing, if you choose which one was relevant to what you need to look for, you could go into that straight away and then that tells you what you want.*

Interviewer: *Have you noticed a change in the way of learning science?*

Student: *Yes like normally for homework do questions 7 to 8 is like look at this page and you might like to add a question or something or visit another site to do revision.*

At Tris’s school one student rang a program in US on behalf of his teacher to advertise his teacher’s website. Here is an excerpt of the conversation:

Student: *I have been asked by my teacher to give you a website. His aim is to get 10,000 hits before the end of term.*

TV Presenter *Don’t you think its cool that you have a science teacher with his own blog, and he does podcasts too…*

Student: *Everyone at school visits his website.*
This You-Tube clip demonstrates the ownership of their teacher’s website by the students.

S1 I am not sure if this is right but i think a comet’s tail is made out of hydrogen, carbon, nitrogen, and oxygen.

S2 I’m trying to fing out what a comments tail is made of but all websites a different, but I’ll Keep trying!

S 3i think that this is right… : comets actually have two tails-the dust tail and the ionized gas tail. the dust tail is [predictably] made up of dust particles, it is spread along behind the comet’s path. the second tail is made of ions [electrically charged particles] and it comes from the nuclues of the comet, because of the suns magnetic field it points opposite the sun. =]

S4 okay… my guess for the comet picture is…a comets tail is made up of gases like hydrogen, carbon, nitrogen and oxygen and other materials such as dust that are driven [blown] off the comet by the heat of the sun and solar winds.

or so says http://apod.nasa.gov/apod/ap960326.html

S5 i think the comet’s tail is made out of gas.

S6 ok well i just searched what a comets tail was amde out of and the website said; smoke-sixed dust particles driven off the nucleus by the escaping gases. im not sure if this is right but could you let me know if it is?

S7 i havnt been able to find a web site exept for the one i was just on but that wasnt verrry helpfull lol

S7 Sorry I couldn’t find a website. But I thought the dry ice video+experiment was pretty good. I found the website really useful.

Teacher  S4, S5 S6 and have all got it at least partly right. Thanks to S4 for giving us the NASA website so we could all find out more about comets - that’s where the new picture is from too.  
Kendra - can you tell me something you found out by accessing the website on dry ice experiments that you didn’t know before?  
S8 I'm guessing someone has already guess the right answer, but i did find the answer.

S10 A comet generally has two tails, not one. As shown in the picture at the top of the page, and the website I was on, one tail is due to the comets dust particals, the other is due to ionized gas from the comet.
S1 I have added the site I used above. Hopefully it is useful to some people. 
Teacher No problems S10. You are right about the heat and dust.
S10 oops sorry i meant to say that the heat from the sun and hte winds blows away the gass.

S9 i think that the comets tail is made up from gas and dust, also the heat from the sun helps see the gassines. my answer is probably wrong but i did not understand the answer on where i looked at. 
but anywaii i think you have put heaps of interesting and useful stuff on this site, but i especially liked the dry ice videos!  and im sorry but i haven’t been able to find a good website. :

Figure 8 Excerpt from the Blog for Year 7 topic on Comets
Discussion

All the teachers involved in this project had an excellent professional attitude and sincere intentions to succeed. They had strong existing philosophies and understandings of learning. They appreciated the opportunity as indicated by Deb’s comment, that there is “not much point in the teachers doing professional learning if it is not translating into making a difference in the classroom”.

As a result of experiencing the training all participating teachers established webportals that provided them with an online presence with a variety on capabilities such as a blogs, podcasts, You-tube clips etc. However, the learning value of the Web 2.0 technologies is in the interactivity and communication among the members of the online community providing them with opportunities to remix, recreate and construct meaning. The amount of participation varied for a number of reasons such as the teacher not appreciating the significance and power of the students’ interactivity and communication and therefore not situating or scaffolding the tasks correctly. The technology alone does not provide an online learning environment and much emphasis, was made of the context and the way the technology is used. The case studies of the teachers classified as exemplary provide rich examples of the Web 2.0 technologies being used as authentic learning environments.

There was a distinction between the type of participation/communication that was sought by teachers:

- within a class, - interclass,
- within a school, intra school,
- across schools, interschool,
- global -a public audience – not necessarily a classroom or school.

Each category offers specific teaching and learning opportunities. For the case of Jackie and Tris, the schools worked in an open global learning community – with students using websites that are available for viewing on WWW, compared to schools such as Lavender school – where they were working in a more closed learning community.

When teachers made their weblogs, initially they were all able to be viewed on the WWW. This was not suitable for all schools, especially for younger students, or for classes wanting to post photos etc. These dictated the need for a more closed and secure community. In the case studies, Tris and Jackie are both working on a global learning community whereas with Deb, while the sites were open to the public in 2007, the work in 2008 is now on a more
closed platform - available to the school only. Each type offers different attributes that can be used to promote learning.

The PD also had a quality pedagogical focus to create self initiated life-long learners that promoted student thinking skills. A primary aim of the project was to improve/promote thinking skills among students. However, this outcome was dependent on the teachers’ interpretation of the PD instruction and its implementation. Consequently the research has focused on the teachers’ interpretation of the PD instruction and its implementation. There was limited secondary evidence of students’ thinking skills and little evidence of students’ metacognition.

**Successful Aspects**

All teachers were highly motivated and enthusiastic about the project.

All teachers were positive about the EC efforts, instruction and support. Many teachers recognised this as being critical to the successful implementation of the technologies. He adapted to the needs of the participants and responded to their progress. The intensive PD (the Summit) was well received by all participants with the responses regarding the consultants’ competence, attitude, behaviour and enthusiasm all extremely positive with means ranging from 4.7 to 4.8. The educational consultant provided excellent resources, stepwise instructions and online, ongoing support.

A number of classes accessed and used stimulating material freely available on the web in creative and new ways, for example the Teenage Affluenza video, which promoted a lot of discussion.

As a result of the project some instances of original ways of teaching and learning with Web 2.0 technologies have been developed for use at secondary and primary levels and across various subject areas.

The combination of the pedagogical and technological foci proved a successful approach to integrating the technology into teaching. By recognising the importance of skills and teaching methods, and identifying or creating learning opportunities whereby the technology provides potential platforms for communication and learning, proved to be beneficial with positive feedback from the students to their teachers. All of these factors helped the project to succeed.
Difficulties

The scheduling of the project had two difficult aspects, firstly, many teachers were not familiar with the potential of Web 2.0 technologies for teaching and learning, and secondly, there were some shortcomings in communication.

*Web 2.0 technology* is a new term and not generally well understood by teachers, let alone its applications to school learning situations. The subtle way in which *Web 2.0 technology* differs from existing ICT uses in teaching and learning was not evident at the introductory meetings, as a hands-on approach was not used. Teachers might not have recognised what the likely outcomes of the project could be for themselves, in their own classroom. The EC focused on the pedagogical aspects in particular CEQ.ALL. This is an excellent framework to promote intrinsic motivation and meaningful learning that was being applied to the Web2.0 technologies.

There was no planning made for meetings after the Summit, perhaps leaving teachers not knowing of the future expectations of the project. The October meeting was arranged quite late - between 12th- 20th September, 2007 and the details of the final assessment task were initially vague with no set date or task description until October 18th, when the project was nearing completion.

The benefits of the new technologies were not always recognised. So for example Banksia school withdrew very early in the life of the project and is not included in the results because no teachers attended the PD. They aborted the project in the initial stages because the Web 2.0 technologies did not fit with the school’s traditional fixed curriculum. Banksia school claimed they already had an Intranet that served some similar purposes e.g. providing discussion and chat space. The advantages or benefits of the new technologies were not felt necessary or worth the effort in overcoming the limitations. The invitation to schools that was passed onto selected, nominated, or volunteer teachers may not always have attracted teachers who were genuinely interested or adequately skilled in the use of ICT, with some teachers attending because it was expected of them by the school administration. Some teachers’ expectations were sometimes different to those of the consultant and the organising association despite the obligations and expectations of the attendees being outlined, in detail, at the introductory meeting held at each school.

The skills of the participants varied with some participants finding the PD too slow or inefficient. For example an ICT teacher, Denise was skilled in ICT - “I think there’s still a lot of knowledge that teachers don’t have on the basics of how to do something.” Also, the mix...
of teachers was not homogenous. It varied across the disciplines and the age of students they taught.

There was continual e-mail support between the participants and the EC, as they needed it. However, there was a lack of networking and communication among the project participants and also a lack of opportunities for communication among students of those involved in the project. For the teachers, having only met during the three-day Summit, at which the attendance varied, the opportunities to bond were limited. The blog set up for the teachers was not well used and the anticipated communication among students at different schools did not occur except for communication among three schools during the webquest task.

The teachers were all enthusiastic about the potential of the project but found time to be a major constraint: “It’s time but it’s more than time, it’s having the opportunity to embed it in an authentic way into a learning program that’s prescribed, that’s difficult.”

School Internet policies varied, with some being more restrictive than others. Some teachers found it difficult to access the You-tube clips that the EC sourced. A comment by the EC referred to some instances where there was a lack of direct access to the Internet by students, with the teacher becoming the intermediary and therefore actually making choices for the students.

There was in some instances a necessity to work within existing curriculum and assessment parameters. For example Deb did not want to disadvantage her students who were using the web-based approach but still had the same assessment as the students who had experienced the traditional approach.

Some teachers wanted to have enough confidence to use the technology assertively and fluently so that they could empower people rather than cause confusion. While others wanted to separate the pedagogy, creativity and a technical skill in various applications because they felt time was wasted covering aspects with which they were already familiar. Others wanted to promote the online teaching forum.

Multiple independent evaluations were requested of teachers by AISV, the EC and the Deakin team. They were at times at odds with each other and this could explain the poor response rate to the final questionnaire.

**Benefits**

The project provided opportunities for teachers to:
• become “experts” in Web 2.0 technologies,
• take on new leadership roles,
• have their professional development recognised,
• receive feedback from students and other teachers – within the school community and beyond the school community,
• form new relationships with other bloggers, and to
• invigorate their teaching.

The project provided opportunities for students to:
• become bloggers and learn about how an online learning environment operates,
• communicate with other students on common tasks,
• become more skilled at researching and accessing information on the web, and
• to participate in a more flexible learning environment - allowing greater choice.

The project provided opportunities for schools to:
• form liaisons and generate links with other independent schools.
• benefit from the AISV association.

Future - Post 2007 Program

The 2007 MyPlace Project has continued into 2008, with two teachers, Deb and Tris, each of them leading developments at their school and arranging visits from the EC to support this. The partnership formed between the AISV, the respective schools and the educational consultant has meant successful ongoing professional development for the staff.

According to the EC there are three requirements for future participants:

1. A satisfactory skill level - including a familiarity with web resources, and a regular user of web resources.
2. Governance - Support from the school for the participating staff.
3. Curriculum - an openness to connect to current issues and flexibility among what they are teaching (EC, Aug 08).

While the impact of the project over the period of the project has been monitored, the longer term impact can only be extrapolated from the current evidence.

Implications

There is a need to value the social interaction and networking provided through the creation of learning communities amongst teachers. Communication breakdown results in
less feedback and reduced momentum resulting in isolated learners, unsupported and at risk of failure. A lack of motivation to change current practices, reticence to take risks, feelings of isolation and vulnerability of not being as skilled as the students with respect to ICT are factors that need to be confronted.

The schools should allow for time release for teachers participating in professional development. Another similar project has begun in 2008 and the format has changed so that teachers do not attend during the holiday period and the professional days are staggered so that teachers have an opportunity to network.

The program intentionally integrated the pedagogy with learning the new skills to create meaningful and purposeful activities. It does however, require practice and time to develop skills, and this can lead to frustrations. Catering for individual needs requires small groups and flexibility and these aspects were intentionally built into this program. Reasons for a lack of uptake of the resources are mixed including teachers’ time constraints, assessment demands and curricula demands.

The exemplary teachers (two mavericks and one innovator) were secondary teachers, suggesting that there was greater capability for this technology at the secondary level. Students in each of their classes were blogging and using ICT competently. The participation in the program has led to these three teachers taking on leadership positions – utilising the Web 2.0 technologies in additional domains and teaching other teachers at their respective schools.

Opportunities to celebrate teachers’ successes could be included to help to give greater recognition to the teacher for their efforts. Greater recognition by school management and other staff both in terms of time and developing expertise may raise the value afforded professional development programs.

The scaffolding of learning and the sequencing of PD sessions need to be taken into consideration. The program intentionally had three staff from each school to provide a core of staff to support each other. When these staff are in different disciplines or levels the opportunities for support are minimal, so it would be recommended that teachers come in teams with some objectives in mind so that they have a desired objective, and are focused and working collaboratively on a common task.
Summary of Findings

This evaluative report of the project *The Development of Thinking Skills Through ICT* has identified the following findings:

- All of the schools had excellent ICT resources available to staff and students, the only limiting factor in some schools was the restriction on access to Internet sites.

- The study showed that at the beginning of this project, most of the teachers involved in this study did not have a good appreciation of Web 2.0 technologies and how they could be used in teaching, however, by the end of the project most of the teachers had gained an appreciation of the potentials of the technologies and three of the thirteen teachers were using the technologies extensively.

- The study helped to illustrate some of the active and passive capabilities of the Web 2.0 technologies in school learning situations primarily through:
  - communication among teachers and students by using various structures such as weblogs to allow and promote communicating with other learners, and accessing/sharing information, getting feedback reconstructing data, responding to data, etc.
  - being a repository of information, data that allows flexibility and choice in when and how the information will be used.
  - Utilization of various modes of data- such as video, text audio through a variety of formats- e.g. class portals, podcasts, and Internet links (including links to animations, simulations and interactive sites).

- The study identified some significant characteristics not necessarily unique to the Web 2.0 learning technologies, but supported by them, that were used to creating learning opportunities to support thinking such as:
  - having a purpose to all tasks,
  - situating these in a meaningful, authentic context,
  - setting challenges,
  - being able to access vast amounts of data,
  - using stimulating material in a variety of formats including audio, visual and text data,
  - giving ownership to students,
  - providing feedback,
allowing for freedom of choice so students direct his/her own learning and
promoting a love of learning through intrinsic motivation.

- The Web 2.0 technologies made use of Internet resources, web-based forums, digital learning communities, and digital resources that allowed easier access, greater flexibility and more interactive programs for students.

- Teachers developed lesson sequences that used the Web 2.0 technologies. They used pedagogical approaches such as setting challenges and posing big questions that require analysis and evaluation, using thinking routines, valuing students’ responses and opinions and extending to students’ varying degrees of choice as to what and how they are learning.

- The learning value of the Web 2.0 technologies was demonstrated to be in the interactivity and communication among the members of the online community providing them with opportunities to remix, recreate, respond to others, get feedback and construct meaning.

- The change in teacher practice as a result of the project was varied. The impact on teaching could be seen through various examples that included change in practice such as increased teacher confidence, and self efficacy, the use of new teaching approaches and new stimulus material, being more inclusive of students, the building teamwork between students and teacher, having increased pedagogical / technological knowledge and promoting thinking skills and metacognition.

- Not all students were familiar with the Web 2.0 technology, for example not all students were confident bloggers, rather, students tended to be very uncertain about their postings possibly because it was in a school forum; with minimum requirements being met by students.

- The students’ learning was witnessed in various cases that provided evidence of Web 2.0 technologies being used to promoted learning through a variety of ways including: promoting engagement and choice, providing opportunities for creativity, providing for participation and receiving feedback, being flexible, and allowing collaboration.

- The importance of an online /digital learning community is developing as a significant way/means of learning that utilises new technologies. The aspects that have been shown to be significant from this project are:
• Triggers or reasons to write that promote discussion; the communication will not start spontaneously and thus requires some pedagogically sound planning.
• Stimulus material –motivating students to view.
• Consistency and regularity in posting- dependability, thereby developing an online presence and personality.
• Building confidence in writing-with students’ understandings the audience, risks, and the protocol.
• Allowing all stakeholders an equal opportunity to respond.
• Texting requires the learners to communicate their understanding through a written form thereby expressing their own understanding and also the reading and interpretation of the text.
• Provides the teachers with feedback on the understanding of the learners’ who respond.

The case studies provide evidence of teachers using the Web 2.0 technologies to provide opportunities to promote higher order thinking skills, specifically in the five characteristics: Higher-order thinking, Metacognitive awareness, Team work/collaboration, Affect towards school / learning and Ownership of learning.

The personalised professional development in Web 2.0 technologies provided by the Educational Consultant allowed teachers the opportunities to develop their own expertise in the new technologies, before selecting appropriate pedagogical techniques to integrate the technologies into their own teaching context.

Implementing the project in a real unit of work was pivotal to the success of the PD, however, the teachers required time to become skilled and develop new programs and schools were not always able to provide this.

The professional learning program provided excellent resources, feedback and support for teachers. The EC modelled sound pedagogical methods on the online space, however, the online participation by the participants was disappointing.

Teachers who excelled in the project were intrinsically motivated, highly interested in the use of ICT in promoting learning. All teachers who attended the PD improved their ICT skills by being involved in the project

The “hands-on” PD sessions were valued most highly with teachers appreciating the direct access to the experienced educational consultant. The educational consultant
provided a variety of instruction and resources and modelled particular pedagogies.
Some of the teachers’ case studies show how the suggested pedagogies such as
CEQ.ALL and Thinking Routines were adopted by teachers and used in their lessons.

Recommendations
There are three areas for which recommendations are made, namely technology,
pedagogy and professional development.

Technology
It is recommended that teachers are provided with examples of a variety of Web 2.0
technologies and potential applications in teaching, to avoid teachers volunteering to
undertake the professional development without fully understanding the capabilities of Web
2.0 technologies in teaching.

Teachers undertaking this PD need to have a good ICT skill level, a familiarity with
web resources, and be a regular user of web resources (beyond the Web 1.0).

Teachers need to have opportunities to use and implement the Web 2.0 technologies
into their teaching. It is recommended that teachers come into the project with an objective or
purpose for using the skills that they will develop, thereby making the professional
development useful, and meaningful.

Teachers participating in this PD require resources and support, (technological, time
and recognition) from the school to complete the objectives of the PD.

Pedagogy
For teachers to maximise the pedagogical potential of the technology they need to be
highly skilled in ICT. Therefore the teachers need time to develop these skills to the
necessary level alongside developing appropriate pedagogies.

There is potential for the identification and development of new pedagogical
approaches using the Web2.0 technologies. Aligning the development of both appropriate
pedagogies and technological skills is recommended.

Professional Development (PD)
• PD provides instruction and learning opportunities in the area of need for the
  school and that area should also be desirable to the teacher, thus creating situation
  where the teacher is intrinsically motivated.
- School administration and school leaders valuing and recognising the teachers’ efforts in undertaking PD through:
  - time allocation for attending and then practising / applying ideas from PD;
  - inclusion in professional reviews;
  - the value of investing in teachers PD recognised.
- The sequencing of PD sessions should scaffold the teachers learning - this includes timing and length of instruction, support, and follow-up.
- The expected outcomes of the PD should be clear and there should be agreed expectations with respect to teacher involvement and commitment.
- PD should include teachers actively learning new skills and knowledge.
- PD should provide opportunities for teachers to:
  - share their expertise with others,
  - work collaboratively with other teachers,
  - situate their learning in their professional work.
References


Tytler, R. (2004). Higher Order Thinking: Support Reading for EME244/502 (pp. 1-7): Deakin University


Appendices

Appendix A Teachers Questionnaire – Prior to PD
Appendix B Participant Questionnaire - Evaluation of 3 day Professional Development
Appendix C Protocols for Blogging
Appendix D Interim Report submitted to AISV in August 2007
Appendix E ICT Integration Research Proposal by Gerard Calnin
Appendix F Critical Thinking through Personal Learning: Integrating Pedagogy and Web 2.0 Technologies by Tom March & Gerard Calnin
Appendix G CEQ.ALL Rubric
Appendix A

AISV Project: ICT Integration Research
Teachers Questionnaire – Prior to PD

Name______________________________________   School_____________
What are your expectations of this project?

_______________________________________________________________

Please indicate the extent of your agreement with the following statements.
SD = Strongly Disagree, D= Disagree, N= Neutral  A = Agree and SA = Strongly Agree

<table>
<thead>
<tr>
<th>My computer skills</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3a. I am confident in finding ways to use ICT in my teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3b. I actively look for ways of incorporating ICT into my teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3c. I use new ICT related strategies with confidence that I can make them work,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3d. I am generally effective in my use of ICT to my teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3e. I am able to answer student questions related to their ICT use,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3f. I am able to make productive suggestions to students using ICT in my classes,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3g. When a student has difficulty with their use of ICT I am able to help them,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3h. I use ICT to engage students’ interests</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3i. I use a range of ICT resources in the classroom</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Over the last term</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
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<tr>
<td>4j. I use e-mail</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4k. I access the Internet</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4l. I access blogs</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td>4m. I download data</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4n. I use CD’s and DVD’s</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4o. I use Word, Excel, PowerPoint,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4p. I use wikis</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4q. I use bookmarks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4r. I use online spaces</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4s. I use audio mp3 files</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

5a. Describe how you have used particular technologies e.g. Bookmarks, Online Space, Class Blogs, and Wiki pages in your classroom.

5b. List any hardware that you use in your classroom and describe how you use them e.g. digital camera, smartboard, audio players.

5c. How would you describe your ICT skills
Appendix B

DEAKIN UNIVERSITY
FACULTY OF EDUCATION

AISV ICT Integration Research Project

Written questionnaire for evaluation of 3 day Professional Development

Your evaluation of the professional development unit will be taken into account in planning for the future and will help staff better meet student needs. Your responses are anonymous. Your feedback is valued.

Please circle the number that most closely shows your reaction to the statements below; from 'Strongly Disagree' (SD), ‘Disagree’ (D), N- ‘Neutral’, ‘Agree’ (A) to 'Strongly Agree' (SA).

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The professional development was well organized</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>The workshops were interesting and well taught</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>The length of the PD is about right.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>My attitude towards ICT has changed during this week</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>The PD was relevant to my teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>The PD was successful in increasing my confidence to teach with ICT</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>My interest in the applications and resources of ICT has been stimulated</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>I have been introduced to some new ideas about curriculum</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>My ability to use applications of ICT has been stimulated by this unit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>I have identified links between the use of ICT and the curriculum</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11.</td>
<td>The balance between learning ICT skills, developing curriculum resources and exploring strategies for implementing ICT effectively has been appropriate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12.</td>
<td>The resources on the Internet have useful to support my learning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13.</td>
<td>The PD session has motivated me to think about my teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14.</td>
<td>I can describe methods of using ICT to provide opportunities to improve learning outcomes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The Consultant

17. The consultant has displayed competence in teaching in the content area of ICT 1 2 3 4 5
18. The consultant’s attitude and behaviour towards me has encouraged my learning in this PD session 1 2 3 4 5
19. The consultant has been enthusiastic about teaching with ICT 1 2 3 4 5
20. The consultant has pitched delivery of the ICT skills at an appropriate level for me. 1 2 3 4 5

Please answer the following questions and provide comments about the course.

1. What are the **most useful and/or valuable** thing that **you** have learned in this PD?

2. What were the **least useful and/or valuable things** about this PD?

3. Can you suggest **additions and/or deletions** to the Professional Development?

4. Please comment on the value of your use of blogs, wikis, bookmarks, online spaces?

5. Are there any changes you would recommend concerning the running of the PD?

6. Any other comments about the unit are appreciate
Appendix C

An excerpt from Tris’s website – a guideline to blogging

Commenting Guidelines

A sincere welcome to the site. If you would like to comment please abide by the following simple rules:

1. Make meaningful comments which contribute to the site. “Hello Mr. B” won’t cut it. Post some useful, relevant information, or ask a clear question, or don’t bother.

2. Watch your spelling and grammar. Don’t write your comments in ALL CAPS. Try to use full sentences where possible. Don’t write “U” if you mean “you”. The internet is mainly a text based communication tool so communicate clearly.

3. No foul language. Enough said.

4. Be polite and respect others. No personal attacks on other people. No flaming or flamebait.

5. Respect the privacy of others. Never post information about another person unless they expressly ask you to.

6. No tasteless or otherwise objectionable material or links.

7. No spamming or advertising.

These rules are regularly reviewed and adjusted. It is your responsibility to ensure that you remain cognisant of their contents.

Please note that all comments are moderated and the site administrators, reserve the right to take any action they deem necessary to enforce these rules. These actions may include moderation and/or removal of your posts, banning from this site, etc. Please note that site administrator’s actions are final and no discussion will be entered into.
Appendix D

Interim Report August 2007
Interim Report August 2007

AISV Project: ICT Integration Research

By
Gail Chittleborough
Filocha Haslam
Wendy Jobling
Peter Hubber
Russell Tytler

Deakin University

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gail.chittleborough@deakin.edu.au
Interim Report August 2007

AISV Project: ICT Integration Research

The Evaluation of the Study

The overall aim of the evaluation is to provide an assessment of the effectiveness of the professional development intervention on the use of learning technologies in supporting the development of higher order thinking skills for students. The aim of this assessment is to inform the future roll out of the professional development program to a wider range of schools.

The evaluation uses an interpretive methodology utilising a range of data generation methods, to build insight into the five research areas outlined in the proposal: Higher-order thinking, Metacognitive awareness, Team work/ collaboration, Affect towards school / learning and Ownership of learning. The data will be considered from multiple perspectives including from the consultants, teachers and students.

Data gathering includes monitoring students’ and teachers’ use of various smart tools, analysis of curriculum documents and delivery methods, analysis of student work samples, interviews, focus groups, and questionnaires (see appendices).

The research / evaluation questions

2. What ICT facilities and resources are available in the schools that can be utilised in the implementation of the project? Describing the situation, resources and facilities available at each school as well as the background knowledge and past experiences of staff and students with respect to thinking skills.

3. How can curriculum content and delivery methods be constructed so as to support the five research areas: Higher-order thinking, Metacognitive awareness, Team work/ collaboration, Affect towards school / learning and Ownership of learning?

4. What aspects of the teaching approaches that use learning technologies support each of the five research areas? For example: examining the appropriateness of the methods used to support the development of higher order thinking skills for students.

5. In a case by case situation, for each teacher and students, how successful is the intervention in achieving a positive change in:
   a. Teacher classroom practice?
b. Teacher understanding of the potential role of ICT to support higher-order and metacognitive thinking and effective pedagogies relating to these?

c. Teacher utilisation of ICT resources and facilities such as blogs, wikis, podcasts, web-quests etc?

d. Students’ opportunities to perform higher level thinking skills?

e. Students’ metacognitive awareness?

f. Teacher and student attitudes to virtual learning environment (VLE)? Collaborative relationships among and between teachers and students?

g. Students’ sense of ownership of their learning?

6. What aspects of the professional learning program have provided opportunities for teachers to encourage their students’ higher order thinking skills?

7. What aspects of the learning technologies have provided opportunities to encourage students’ higher order thinking skills?

**Participants**

There are 13 teachers currently working on this project, from well-resourced schools in metropolitan area of Melbourne, Victoria (see Table 1). The teachers have access to a variety of current technological hardware and software including fast internet connections, IWB, digital camera, data projectors etc.

Table 1 The participating schools\(^1\), teachers and extent of uptake of the ICT

<table>
<thead>
<tr>
<th>School</th>
<th>Number of staff</th>
<th>Subject</th>
<th>Year levels</th>
<th>Uptake*(1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azalea</td>
<td>3</td>
<td>ICT/ Health Science</td>
<td>Year 11</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year 7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year 6</td>
<td>1</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>2</td>
<td>Science Humanities</td>
<td>Year 9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year 9</td>
<td>3</td>
</tr>
<tr>
<td>Lavender</td>
<td>3</td>
<td>Technology</td>
<td>Year 6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year 6</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Year 5</td>
<td>2</td>
</tr>
<tr>
<td>Hibiscus</td>
<td>3</td>
<td>Library Outdoor Education</td>
<td>Year 7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Year 9</td>
<td>3</td>
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<td></td>
<td></td>
<td></td>
<td>Year 9</td>
<td>3</td>
</tr>
<tr>
<td>Rose</td>
<td>1</td>
<td>LOTE</td>
<td>Year 12</td>
<td>3</td>
</tr>
<tr>
<td>Banksia</td>
<td>1</td>
<td>None</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

*Uptake – an assessment by the researcher on a scale of 1 to 5 with 1 being minimum and 5 advanced participation

\(^1\) Pseudonyms are used throughout this report
**Teachers ICT skills/confidence /expectations**

Twelve of the thirteen teachers expressed specific individual expectations for this professional development program. The two main expectation that was repeatedly expressed were to develop skills in the use of new technologies, thereby increasing confidence and to learn how to use new Web 2.0 technologies in their own teaching.

Teachers were surveyed about their experience with ICT in the classroom and their skills (see Appendix A for Teachers Questionnaire – Prior to PD survey). The quantitative results are shown in Table 2. The results show that the teachers are capable and experienced with ICT, with 12/13 teachers agreeing or strongly agreeing with the item 3d *I am generally effective in my use of ICT to my teaching* and all participants agreeing that they *use ICT to engage students’ interests* (item 3h). This experience is evidenced by the teachers’ responses to Q.5a where teachers described their varied experiences with new technologies such as IWB, blogs, podcasting, bookmarking etc. All teachers agreed that they *actively look for ways of incorporating ICT into their teaching* (item 3b). The teachers written responses to questions in the questionnaire provide corroborating evidence, for example:

- We have developed a library wiki with which has a number of pages for different groups in the library e.g. book club, writers club etc it has been introduced to students and some have started posting contributions. (Jackie)

- I have a Year 9 science unit running off a blog, again they can comment about their research (Tris)

- My Year 11 IT students are using a blog to discuss exam preparation- currently they are using a blog on our intranet to share their experiences (over the holidays) in learning html (Deb)
Table 2 Results of the Teacher Pre-Questionnaire (N=13)

<table>
<thead>
<tr>
<th>My computer skills</th>
<th>SD*</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3j. I am confident in finding ways to use ICT in my teaching</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3k. I actively look for ways of incorporating ICT into my teaching.</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3l. I use new ICT related strategies with confidence that I can make them work,</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3m. I am generally effective in my use of ICT to my teaching</td>
<td>1</td>
<td>9</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3n. I am able to answer student questions related to their ICT use,</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3o. I am able to make productive suggestions to students using ICT in my classes,</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3p. When a student has difficulty with their use of ICT I am able to help them,</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3q. I use ICT to engage students’ interests</td>
<td>9</td>
<td>4</td>
<td></td>
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</tr>
<tr>
<td>3r. I use a range of ICT resources in the classroom</td>
<td>1</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*SD = Strongly Disagree, D= Disagree, N= Neutral  A = Agree and SA = Strongly Agree

<table>
<thead>
<tr>
<th>Over the last term</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>4t. I use e-mail</td>
<td>13</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>4u. I access the Internet</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4v. I access blogs</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
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<td>4w. I download data</td>
<td>1</td>
<td>2</td>
<td>8</td>
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<tr>
<td>4x. I use CD’s and DVD’s</td>
<td>1</td>
<td>4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4y. I use Word, Excel,</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td></td>
<td></td>
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<td>PowerPoint,</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4z. I use wikis</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4aa. I use bookmarks</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4bb. I use online spaces</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4cc. I use audio mp3 files</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The PD program

The nature of the program

On 30th November 2006, the primary educational consultant, EdC1 introduced the concept to the participating schools at an introductory talk and presented the CEQALL philosophy as a foundation for learning with Web 2.0 technologies. The obligations and expectations of the attendees were outlined in detail.
**Introductory visits**

Introductory meetings were held at each of the participating schools during March 2007 with the educational consultant, EdC1. Pedagogical and technological aspects of the program were presented during a 40-60 minute presentation. Again the CEQALL framework was elaborated on along with the significance of optimism associated with:

- Intrinsic motivation
- Internalized critical thinking
- Scaffolded differentiated learning
- Academic optimism / culture

**The summit**

The three-day professional learning summit for all participating teachers was held at AISV South Yarra facilities from July 2-4, 2007 during the school holiday period. Representatives from the six participating schools were present, however not all participants were able to attend all sessions.

Only Eucalyptus school had their portal establishes before the summit. Despite having access to the resources earlier, the participants generally had not started because of time constraints and lack of confidence or expertise by some participants.

Over the three day period participants were introduced to social software resources from the educational consultant, EdC1’s website. A hard copy of the resources plus a CD was distributed to all participants. The teachers were able to work on their own class portals, blogs etc, with EdC1 assisting at both the technological and pedagogical level. The representation produced by the AISV Educational ICT Consultant EdC2 aimed at clarifying the variety of tools available to teachers see Figure 1.

---

2 EdC1- abbreviation for the AISV Educational Consultant
Teachers who were in attendance in the third and final day of the 3-day Professional Development Summit program completed the Professional Development Questionnaire (see Appendix B). The quantitative results are summarised in Table 3. All items except Items 2 and 3 have mean values of greater than or equal to 4.0 indicating that overall the participants agreed that the professional development (PD) program was of benefit to them. The participants agreed most strongly that the PD was relevant to their teaching (item 3, mean = 4.4), that their interest in the applications and resources of ICT has been stimulated by this unit (item 7, mean = 4.4) and the resources on the Internet have been useful to support my learning (item 12, mean = 4.5).

The responses regarding the consultants’ competence, attitude, behaviour and enthusiasm were extremely positive with means ranging from 4.7 to 4.8. This is supported with comments from interviews with several teachers being very complimentary of EdC1 saying that he responds quickly to e-mails addressing educational and technical issues.
Table 3 Results of the Questionnaire for Evaluation of 3 day Professional Development (N=10)

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. The professional development was well organized</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>41</td>
<td>4.1</td>
<td></td>
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<tr>
<td>20. The workshops were interesting and well taught</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>41</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>21. The length of the PD is about right.</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>30</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>22. My attitude towards ICT has changed during this week</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>28</td>
<td>2.8</td>
</tr>
<tr>
<td>23. The PD was relevant to my teaching</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>28</td>
<td>2.8</td>
</tr>
<tr>
<td>24. My attitude towards ICT has changed during this week</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>40</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>25. My interest in the applications and resources of ICT has been stimulated by this unit.</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>44</td>
<td>4.4</td>
<td></td>
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<tr>
<td>26. My attitude towards ICT has changed during this week</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>40</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>27. My interest in the applications and resources of ICT has been stimulated by this unit.</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>40</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>28. I have identified links between the use of ICT and the curriculum</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>43</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>29. The balance between learning ICT skills, developing curriculum resources and exploring strategies for implementing ICT effectively has been appropriate.</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>40</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>30. The resources on the Internet have useful to support my learning.</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>45</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>31. The PD session has motivated me to think about my teaching.</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>43</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>32. I can describe methods of using ICT to provide opportunities to improve learning outcomes</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>43</td>
<td>4.3</td>
<td></td>
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The Consultant

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>33. The consultant has displayed competence in teaching in the content area of ICT</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>48</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>34. The consultant’s attitude and behaviour towards me has encouraged my learning in this PD session</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>47</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>35. The consultant has been enthusiastic about teaching with ICT</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>48</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>36. The consultant has pitched delivery of the ICT skills at an appropriate level for me.</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>43</td>
<td>4.3</td>
<td></td>
</tr>
</tbody>
</table>

*Strongly Disagree’ (SD), ‘Disagree’ (D), N- ‘Neutral’, ‘Agree’ (A) to ’Strongly Agree’ (SA)

Opinions of the suitability of the duration of the program were mixed with Item 3 *The length of the PD is about right* having a mean value of 3.0. In the written comments for this questionnaire, two respondents (Q3 c, f) proposed a shorter PD of 2 days duration; and 3 teachers requested the PD not to be held during the holidays (Q5 b, d, j). This was reiterated in an interview with Denise, a teacher from Azalea School who has good ICT skills and felt that the work at the summit could have been covered in half a day.

The mean for the responses to item 2 *My attitude towards ICT has changed during this week* was 2.8 with a bimodal distribution, indicating that for most of the teachers the
instruction did not change their attitude to ICT. Despite this the very positive responses to the other items indicates that the PD was appreciated and valued.

**The story so far in each school**

The stories draw on interview data from teachers about their experiences in the first 6 weeks of Term 3.

**Case stories of teachers in the program**

*Azalea School*

Three teachers are involved in the project (see Table 1) Denise and Deb gave a presentation to staff recently on their work with portals. Denise is working with year 11 students teaching ICT applications, but this had not been as fruitful as she had hoped. Denise expressed frustration at her own lack of technical expertise. Alice is a Year 6 teacher with 26 students. She has set up a class portal on the theme of power - so far it has been a descriptive passive site –students have looked at video clips, students like the site and are becoming familiar with it. Deb has made a class portal specifically to teach the topic of Forces to her Year 7 class (24 students). She is responding to being in a rut of teaching forces in a didactic and traditional way and is using this opportunity to explore a more constructivist approach. Deb wanted a site that was fun and motivating but not gimmicky. She has gradually added to it. The portal has various pages for example interactive games, assignments, revision, “eggcellent” activity etc.

Deb was very impressed with the difference that the portal had made to her class. She commented that the interface was more connected to the students’ experiences and provided excellent stimulus resulting in rich student conversations Her students generated their own definitions requiring more higher order thinking than the more traditional didactic approach.

The CEQALL approach was consistent with all three teachers’ philosophy of learning. They didn’t intentionally use it, but it was consistent with their normal approaches. Denise and Deb commented on the need for a skills workshop – with a need to separate the pedagogy, creativity and technical skills in various applications. Time was an issue, although the school was supportive, the teachers were very busy with other demands. All the teachers were willing participants - volunteering to be involved in this project.
**Rose School**

Indira is a LOTE (French) teacher who has created a class portal for her Year 12 French class. The students have to converse in French on the weblog, access readings through the portal, preparing for their French oral. The students have responded well to the new format. Opportunities like accessing French radio through the portal – evidence the advantages of this type of portal. Isabelle is keen to extend the format to Year 10 French classes. A technical difficult is not having accents available.

**Banksia School**

Deidre reported that the teachers at Banksia school had not used the ICT technologies from the PD to any great extent. The school has IWBs, and while the teacher may make use of some of the resources, the children are not online by themselves at year 7 level.

It hasn’t been adopted because of the nature of the technology. It doesn’t fit with the schools traditional fixed curriculum. Deidre envisaged that a huge amount of work would be needed to integrate it into the curriculum. Banksia school already has an intranet that services some similar purposes e.g. providing discussion and chat space. The advantages or benefits of the new technologies were not felt necessary or worth the effort in overcoming the limitations.

**Lavender School**

Two Year 6 Classes and one Year 5 class are involved in the project. The two Year 6 teachers began the project on the first day of Term 3. The project was jointly developed during the Summit and they have used various tools such as weblogs, blog and bookmarks. Class portals are well established and the teachers are very happy with the progress of the project. One Year 6 teacher explained “Our whole integrated unit of work was placed onto the website. We used the CEQALL framework, we did ‘See, Think, Wonder’ activities and we explicitly taught Thinking Skills … used them during numeracy, literacy activities and so on … the children love it and they have produced some great work”. The other added “We developed it in such a way that we continually add to it. The students can add to the feedback and we continue to add to the pages. So that when this unit of work is finished, we will use it
Both teachers reported that their students embraced the CEQALL approach easily as it was consistent with the approaches that they were already using.

The Year 5 teacher has begun the project and the project is progressing at a slower pace as, unlike the Year 6 students, Year 5 students do not currently have individual laptops.

_Eucalyptus School_

The AISV project was conducted in two year 9 classes at Eucalyptus school. The Year 9 class teacher with 24 students reported that the project was Science based and very successfully completed in 7 weeks. The teacher noted that the project “had really intrinsically motivated students to want to do well”. This teacher’s measure of student success was reported in terms of what students achieved: “students had discovered things that they did not know and on occasions at least 50% of the students experienced the flow of wanting to know… this reflected on the final presentation of the project work which was generally excellent and better than any other work I had seen in the previous years”. The teacher noted that the CEQALL framework worked very well, particularly the _Choice_ component as “all students embraced it with enthusiasm”.

In addition to the project site, this Year 9 teacher set up another site in “an attempt to help students love learning and want to learn”. This site is currently well used, not only by the students in the project but also by many other students that this teacher teaches. The teacher attributes this good usage to student intrinsic interest and the continual updating of the site.

_Hibiscus School_

The students are all girls and all are note book users from Year 5. They work in a fully networked environment with Wireless access. They have Blackboard intranet and a lot of infrastructure they can access. Three teachers are directly involved in the MyPlace project; Cally and Margaret are working with Year 9 students, while the third teacher Jill, works in a teacher librarian position. The teachers are all enthusiastic about the potential of the project but have found time to be a major constraint as well as integrating the project in an authentic way, as shown by the following statement:

“It’s time but it’s more than time, it’s having the opportunity to embed it in an authentic way into a learning program that’s prescribed, that’s difficult.”
Jackie, the teacher librarian, used the Teenage Affluenza video and one of the thinking tasks that went with it and found that it promoted a lot of discussion. Margaret has set up a web log for the Year 9 students who are going on Outdoor Education. She categorised it into three different locations so they could click onto India or Belanglo or the Whitsundays where they would have to comment on the history, culture and geography of the location they are visiting. The reason for building this into the task or investigation was to engender that higher order thinking through making a comparison with another destination that they were not going to. Rather than trawling through the internet for that other information they would be using other information that someone had researched for their own purpose. She found this to be a good use of the blog. Cally described how she was using the project in her class for the same purpose and how it was interesting how few students had actually felt confident enough to go to the blog and type.

The teachers thought that the students would all be confident users of blogs but found that they tended to be very uncertain about their postings. Students are very aware that their postings are overseen. They attend to the normal conventions of language that they would not normally use in the environment and does not use short forms of language despite the fact that this has not been stipulated. Students are aware that teachers are looking for what they have added to the blog in terms of something new, beyond comments such as ‘me to’. Students are treating it differently because it is a school task. Minimum requirements are being met by students rather than students ‘running with it’.

Two factors are identified as impacting on these future plans: the time factor and feeling confident enough about it to teach other people. Two of the group described how they came back after the summit and wrote down a step by step set of instructions on how to embed the YouTube video. They felt that they needed to become fluent with it so that they could empower people rather than causing confusion. Positive reference was made to the posting by EdC1 about how to do it.

The digital community

<table>
<thead>
<tr>
<th>Class Portal</th>
<th>Level of participation*</th>
<th>Class Portal</th>
<th>Use of blogs</th>
<th>RSS feeds</th>
<th>Consistency</th>
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<tbody>
<tr>
<td>7C Tut</td>
<td>Minimal</td>
<td>2 pages – with u-tube links</td>
<td>One set-up but</td>
<td>No</td>
<td>none</td>
</tr>
<tr>
<td>Course</td>
<td>Level</td>
<td>Description</td>
<td>Responses</td>
<td>Details</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
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<td>-----------------------------------------------------------------------------</td>
<td>-----------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Puberty</td>
<td>Intermediate</td>
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<td>Leaders</td>
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<td>• Puberty</td>
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<td>Chang ing States</td>
<td>Intermediate</td>
<td>• Leaders</td>
<td>no</td>
<td>good</td>
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<td></td>
<td></td>
<td>• games, tutorials and revision (11 links),</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• extension activities (4 links)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• just for fun (feed-fish)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>• handouts (6 links to website and notes)</td>
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<td></td>
<td></td>
<td>• dry-ice experiments (4 links +2 u-tubes)</td>
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<td></td>
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<td>• other science sites (2-links)</td>
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<td>• home – spiders, fish- fun, 3 u-tubes for interest/motivation</td>
<td>no</td>
<td>good</td>
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<td></td>
<td></td>
<td>• eggscellent- photos of activity, plus worksheet</td>
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<td>• force links (13 links )</td>
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<td>• videos</td>
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<td>• vote for your favourite scientist</td>
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<td>• Fiji</td>
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<td></td>
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<td>• Thailiand and Laos</td>
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<td></td>
<td>• Life on another planet etc</td>
<td></td>
<td></td>
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<td>• Blast off</td>
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<td>comments</td>
<td>Good</td>
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<td>• china</td>
<td></td>
<td></td>
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<td></td>
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<td>• fun things</td>
<td></td>
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<td>• webquest worksheet</td>
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<td>6R Rappin g Robots</td>
<td>Minimum-intermediate</td>
<td>Weblog blog with links to files and websites</td>
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<td>Fair</td>
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<td>Identit e Francaise</td>
<td>Intermediate</td>
<td>5 pages:</td>
<td>blogs</td>
<td>Fair</td>
<td></td>
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<td></td>
<td></td>
<td>• A quoi sert ce site?</td>
<td>no</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• L’identite francaise: une introduction</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Metisse</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>• La Haine</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>With links on the blog to websites and files</td>
<td></td>
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</tbody>
</table>

(*Classification based on the description – in the summit workshop handbook)
There is a range from minimum to intermediate of involvement on the MyPlace website as summarised in Table 4. There is no podcasting evident, nor is there communication across the class portals yet. The communication on the blog for the teacher has been minimal.

Teachers have used the blog as a source of information, to invite comment, provide links to worksheets, and provide links to motivating websites. Visual and audio stimuli have been used extensively. The discussion on the blogs so far has not demonstrated thinking skills; rather it is a source of motivation and interest. The usage of the blog has not been consistent; rather it is used by students to respond to teachers requests. The teachers’ use of the blog varies according to its appropriateness for the particular topic being taught. Students are responding eagerly to some teachers’ requests, challenges or questions, for example searching the web for good links that provide answers to questions. One teacher has a nice set of guidelines for students for the protocols of blogging (see Appendix C).

The potential of the social space software for education was intimated by EdC1 in his introductory talk. EdC1 anticipated communication among teachers flowing on to communication between students groups and for this to happen alongside the expansion of new technologies. Ed C1 alerted to the difficult time pressures on teachers in an interview in March 2007. In describing teachers foray into the new technologies, he was aware of its scope, but also the limitations or under-use:

“here’s this amazing thing but from a publishing standpoint it really is an open container and people bring to it both the good and the bad of what they’re already doing. So I’d look to use it as a fresh ability to do the student centred learning journey rather than just say, ok, use your blog to post your homework assignments” (interview with EdC1- 17/3/07).

So far the technologies have mostly been used at a minimum or intermediate level of participation – as described in the MyPlace Summit Workshop Handbook p.8. To maximise the use there would be need to be more consistent use of the webspace and greater online collaboration. There is potential for this to occur with for example several classes using the “teenage influenza” you-tube clip, communication across the groups could occur.

**Implications of results and suggestions**

While the professional development during the summit was positively received, the use of the “MyPlace” resources since then has been less than anticipated. The level of communication among the participants is minimal. It is recommended that a follow-up PD
session is arranged in the near future to promote interest, for teachers to get feedback and to provide teachers with help to extend them beyond their current level of participation. Reasons for lack of uptake of the resources is mixed including teachers’ time constraints, assessment and curricula demands and lack of technical expertise.

Opportunities to celebrate teachers’ successes may be needed. They have spent holiday time on this project; they have initiated new forums for communication among their students. The teachers could be invited to write about their initiatives and submit them to professional magazines or give presentations in their school. The assessment so far has been at the teachers’ level. We will in the near future look at the impact of the project on students. Some teachers expressed a concern of not knowing where the project is going in the future. There is no set date for the next meeting and the details of their understanding of the assessment task were vague.

Final opportunities to influence the outcomes for this project are possible. It is suggested that immediate planning and action is needed to capitalize on the work teachers have already done and provide impetus and support for further developments. Suggested actions are – a half day meeting of all participants to discuss and share their stories supported with a face-to face meeting with EdC1- the educational consultant and expert on implementation of the new technologies and a discussion of the planned assessment task- so that all participants are included and aware of the task.
Appendix E

ICT Integration Research Proposal

Proposal

This study seeks to explore the way in which effective use of learning technologies can support the development of higher-order thinking skills for students. The study will examine the relationship between learning technologies, pedagogies, and several of the most important correlates of effective student learning: metacognitive skills, collaborative relationships, a positive attitude, and a strong sense of ownership of their learning.

Rationale

Technology has catapulted us into a knowledge-based, global society. Few, if any, aspects of our contemporary world have escaped the influence of technology: business, recreation, medicine, travel, and communications. The ubiquitousness and pervasiveness of the influence of technology on our lives has been such that we now talk about the ‘digital revolution’. What is clear from this revolution is that the skills and knowledge needed for young people to negotiate and operate in their world successfully are going to be different from those which were essential for the industrialised societies of the 19th and 20th centuries.

At the beginning of the 21st century our educational goals include a desire to equip our young with the skills, experiences and aptitudes to prepare them for lifelong learning and a less predictable future. Our educational goals need to move ‘beyond the acquisition of skills and knowledge, to one that emphasises process and evidence of understanding that will empower students in developing as lifelong learners’ (Watson & Kairouz 2002). As knowledge workers, students will need to access and manage information; more importantly, they will need to sift material, test it for reliability, synthesise and analyse, transfer knowledge to new situations, solve problems and challenge traditional canons.

This emphasis is reflected in local, national and international educational policy initiatives. The federal government has espoused the importance of ICT by identifying it as one of the National Goals for Schooling in the 21st Century (1999) where students will be expected to attain ‘high standards of knowledge, skills and understanding’ in the curriculum area of technology and be ‘be confident, creative and productive users of new technologies, particularly information and communication technologies, and understand the impact of those technologies on society’. The federal government has also recently developed national standards for ICT literacy to be assessed triennially. Internationally, the OECD, in its study,
‘Learning to Change: ICT in Schools’ (2001) acknowledges the importance of providing ‘high quality learning and teaching…to equip young people for the knowledge society’. It argues that ‘students must become discerning and knowledgeable ICT users’. Locally, the state government’s ‘Victorian Essential Learning Standards’ identifies ICT as an essential learning domain within the framework of Interdisciplinary Learning.

Why ICTS & Pedagogy Both?

To explore the significant contributions possible with smart ICT integration, the proposed study will focus both on factors involving technology as well as those germane to more learner-centred pedagogies.

The reason for this is twofold. First, a premise of this study is that a learner-centred approach is a more likely to yield improved student outcomes by offering a curriculum which is sufficiently differentiated to meet the needs of individual students. Second, one only has to visit the Web occasionally to be aware of the “my-ification” taking place. Google and others are at the forefront of learning about their users through detailed analysis of use-patterns, encouraging visitors to profile themselves and their interests. Similarly, these technologies can be used to address what has long been the unreachable goal of classroom learning – individualising learning activities. Rather than learn what style of music a customer is likely to be interested in, pedagogically informed technologies will ultimately help shape more effective personalised learning experiences. This achievement is yet to be realised, but work can be done today to set a framework of the variables and learning styles that will make the “my-ification” substantive, not superficial.

Context for Participation

In the past decade, schools have made considerable investments in Information and Communications Technologies. Expenditures go far beyond computers to include network infrastructure, bandwidth costs and teacher professional learning. Tacit in these expenses was the understanding that ICTs would augment and enhance student learning. Commonly cited areas that are enhanced by technology are higher-order thinking, and skills necessary for participation in the 21st Century work force.

Although research has yielded some findings that can inform integration of ICTs, the difficulty of controlling the many variables influencing the real life dynamics of teaching and learning require a more comprehensive and longitudinal approach. Through the aegis of the AISV such a study is about to be conducted.

A select group of independent schools will be invited to participate in this study. The eight schools invited to participate provide a balance between achieving a large enough sample size and recognition that only a comprehensive approach will yield findings worthy of the search.

To support this comprehensive approach, the study identifies four key areas related to implementation:

- clarity in data collection and measurement
- a three-day professional learning summit for all participating teachers
- ongoing professional learning from a leader in ICT integration through in-person team-teaching and online support, and
- hands-on project management provided by the AISV.

Schools are not being asked to contribute to the direct costs associated with the research (ie, professional learning / research activity) but are being asked to support the project through:
• Providing access for data gathering and, where necessary, ethics approval
• Supporting the attendance of its teachers at the 3-day Learning Summit during the June-July holiday period
• Providing special release time for meetings for participating teachers, professional learning activities, inter-school visits, and time to work with the research team for the purposes of data collection.

Timeline
The following timeline identifies the key dates for the project. A more detailed timeline and project will be provided to participants towards the end of 2006.

<table>
<thead>
<tr>
<th>November 2006</th>
<th>Finalize participant schools and teachers</th>
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<tr>
<td>Mid Term 1</td>
<td>Initial meeting of participants to outline project, commitments, etc.</td>
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<tr>
<td>Mid Term 1</td>
<td>Visits to schools to meet with teacher participants. These visits will begin the development of curriculum based upon the needs of participating teachers and students. Initial assessment tools may be used at this time to collect baseline data.</td>
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<tr>
<td>Term 2</td>
<td>Visits by Tom March and an AISV staff member for a ‘readiness checklist’ which will be used to record details around such topics as computer access, bandwidth capacity, Web skills, pedagogical orientation and attitude. What is learned from the checklist will inform a smoother implementation and customised professional learning process.</td>
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<tr>
<td>June July holiday</td>
<td>During the term 2/3 holidays, a 3-day learning summit will be held at which teachers acquire skills, practice and develop draft curriculum activities. Feedback will be conducted online among the emerging community of learners. Individual support will be available to revise activities before use with the students during term three. Assessments will be built into the process of implementation as well as at the conclusion of the enhanced teaching-learning approach.</td>
</tr>
<tr>
<td>Term 3</td>
<td>Commence classroom activities</td>
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<tr>
<td>Terms 3 and 4</td>
<td>Classroom activities, school-based professional learning, on-line support, school-based meetings of participants, research and data collection.</td>
</tr>
<tr>
<td>End Term 4</td>
<td>Final half-day meeting of all participants to evaluate the programme and make recommendations for future action and research.</td>
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Participants
We are suggesting that 3 teachers from each school participate in the research so that they are able to build internal support structures which are sustainable. While we are suggesting that teachers from the middle years participate, it is not essential that teachers teach in the same faculty or area. Schools are asked to make judgements about those teachers who would be most suitable for the professional research project. We would welcome discussion with individual schools about what might be a suitable group of teachers.

Areas of Research Focus
The following five areas comprise the topics for a review of the literature that will shape the assessment measures and activities developed for 2007.

1. Higher Order Thinking
Rationale
Teaching and learning practices must address the reality that the Web has altered the nature and delivery of information. Previously, teachers, books and libraries were the main sources and media for delivering educational content. For the current and future generations, “information” hovers in cyberspace: hyperlinked, but lacking any overt schema. Contemporary curriculum frameworks acknowledge that an essential skill for students in the 21st century will be the capacity to apply critical thinking skills within the knowledge society. Thus the nature of the learning environment now demands that students analyse, critique and construct as well as “know” and comprehend.

Research
The proposed research will therefore study how curriculum content and delivery methods can be constructed so as to enhance the development of students’ higher-order thinking. Integral to such research will be the development of measures to assess student growth and acquisition of these skills. Past experience with the WebQuest model suggests variables related to procedural facilitation (“scaffolding”), graphic organisers, and interaction with smart tools will help inform this study.

2. Metacognitive Awareness
Rationale
The executive control demonstrated by expert learners is a hallmark of their proficiency. Experts “think about their thinking”, consider the nature of the task and choose appropriate strategies. This kind of cognitive activity would seem to be a precursor to the higher-order thinking required by students who use the Internet as a source for learning. Research suggests that metacognitive skills are causally connected to deep, effective learning.

Research
Research has indicated that a learner’s awareness of their metacognitive processes correlate with the sophistication of their thinking. Measures for reading and writing skills have proved valid instruments. The proposed study could use adaptations of these instruments to register an index of metacognitive awareness. These measures would be used to explore their relationship with outcomes associated with higher-order thinking activities.
3. Team work / collaboration

Rationale

There are two parts to this research focus. The first relates to the ready adoption of social networking technologies by youth and highlights their desire to communicate and engage one another. Instant messaging, chat, short message service, multi-user gaming and Weblogs are the tools that enable this virtual exchange. However, some point to cyberbullying and high profile cases where virtual experiences have led to real life tragedies as cases where students lack insight into more subtle interpersonal skills. Learning more about how students use at least some of these tools to interact with their world could provide insights to shape development of personal learning environments.

The second aspect recognises the inherent conflict that can exist in heterogeneous cultures. On both global and local levels, current events draw attention to the need for successful communities to appreciate diversity within a context of shared values and common goals. Rather than act from stereotypes, sound bites or rallying cries, ICTs provide one clear path toward making significant connections among diverse populations. Besides this worthy educational value of respect for others and differing views, online collaboration is also an important skill set as our students take their places in the workforce of the 21st Century.

Research

The proposed research will therefore study the nature of student collaboration and team efforts. With the above rationale in mind, the study will attempt to engage learners in global, cross-cultural collaborations as well as in-class team projects. The ideal measurement tools will allow for assessments of both learner attitude and behaviour to gain insight into this connection.

4. Affect towards school / learning

Rationale

While research confirms that a positive attitude to learning is an important correlate of learning, this positive attitude is not evident in all students. Many observers would confirm that too many students have a negative attitude toward school and many are disengaged, particularly in the middle years. Expressions like “boring”, “meaningless”, and “a joke” might be heard in student conversations about school. A premise of this proposed study is that humans can experience an innate joy in learning, yet schools don’t always tap this potential.

Research

The literature on motivation highlights how increases in personal relevance and satisfaction affect a learner’s enthusiasm for a task. By assessing such characteristics, the proposed study can use the foundation provided by Motivation Theory to investigate newer ground defined below.

5. Ownership of learning

Rationale

Like affect, students’ perceived ownership and control over their learning has a correlational connection to their achievement. Furthermore, as information, perspectives and interpretations exponentially grow on the Internet, no school, curriculum or government mandates can hope to define what a student will or should know. It has long been argued that “learning to learn” is of more value in today’s world than knowing a body of knowledge. Implicit in this debate is the issue of who is ultimately responsible for students’ learning. When the model was based on delivery and acquisition
of information, it made sense for teachers to be ultimately responsible. If a goal is now the
construction of meaning, it must be realised that this happens in learners and, largely, individually.
Besides this great shift in responsibility from teacher to student, a more subtle change follows – that
of trusting students to do their job of learning. What might be considered “learning” has been
fabricated as “schooling” and this latter construct may actually have become an obstruction to student
achievement and personal growth.

Research
It’s as yet unclear what form of measurement might be used to assess learners’ perceived and real
ownership over their learning. Clearly affect is involved, but it’s likely that changes will need to be
made (and evaluated) in how students are assessed in their work. To truly yield a responsible attitude
to learning in students the approach might involve such aspects as choice in learning goals,
participation in design of learning activities, formative self-assessment and authentic assessments
made by those other than the learning coach (née ‘teacher’). A likely means for conveying this shift in
ownership is the use of a personal learning environment (PLE) which will be explored in the review
of the literature.
27 September 2006

XXX

Dear x,

Re: Research Proposal

The Development of Thinking Skills Through ICT

I am writing to invite your school to be part of a research project which will explore the way in which the effective use of ICT can be deployed to support the development of higher-order thinking skills in students.

AISV is working in partnership with Tom March (Sydney-based ICT consultant) and The University of Melbourne to deliver this research throughout the 2007 school year. It is being partly funded through AGQTP. We are inviting 8 independent schools to participate in this research project, 3 teachers from each school, preferably who teach in the middle years.

Schools are not being asked to contribute to the direct costs associated with the research (ie, professional learning / research activity) but are being asked to support the project through:

- Providing access for data gathering and, where necessary, ethics approval
- Supporting the attendance of your teachers at the 3-day Learning Summit during the June-July holiday period
- Providing special release time for meetings for participating teachers, professional learning activities, inter-school visits, and time to work with the research team for the purposes of data collection.

I have attached further information about the research proposal’s rationale, timeline, participants, and some background for each research focus area.

I would be happy to speak with you, or your representative, either through a visit or by phone. Contact details: 9825 7222 or 0400 896 281 or email: gerard.calnin@ais.vic.edu.au.

I would like to have written confirmation of your interest by the end of October and the contact details of an appropriate contact person at your school.

This is an exciting opportunity and I hope that your school will be able to participate.

Yours sincerely,
Dr Gerard Calnin
Director, Policy and Research
Overview & rationale

The Digital Disconnect

Writing in 2002, demographic researchers noted, “Many schools and teachers have not yet recognized – much less responded to – the new ways students communicate and access information over the Internet” (Levin, Arafteh, Lenhart & Rainie, 2002).

In fact, the same researchers noted, “Students repeatedly told us that the quality of their Internet-based assignments was poor and uninspiring. They want to be assigned more—and more engaging—Internet activities that are relevant to their lives.” (Levin, et al., 2002).

Since this report, “The Digital Disconnect,” two developments in technology have made it not only “nice,” but necessary for teachers to meaningfully integrate “Real, Rich and Relevant” learning (March, MMS). First: broadband to computer – and now to personal devices like phones, mp3 players and game controllers. This means that online resources are no longer constrained to text and simple animations but can encompass the rich media of music, movies and multi-user games. The second development is what many refer to as Web 2.0. One aspect of this new generation of the Web is that visitors can do more than download or “pull” information from Web. New applications “push” targeted content to visitors based upon prior use or formal requests made through subscriptions and registrations. Although this
may not seem like such a change, it is equal to the difference between getting junk mail or what tops your wishlist.

**The New WWW**

This anytime, anywhere opportunity to immediately access your most gratifying pastimes is what has been referred to as “The New WWW: Whatever, Whenever, Wherever” (March, 2005). The problem with regularly pursuing pleasure is that instead of leading to a happy life, it prompts apathy and inertia (Seligman, 2002). As adults, we sometimes know this. Young children rarely do. They are convinced that getting what they want will make them happy.

(March & Calnin, 2006)

The threat to children posed by getting “whatever they want, whenever and wherever” was recognised in the Australian Commonwealth report Beyond the Middle. The authors conclude that in the current globalised culture, it is the “middle years students who are clearly most ‘at risk’”. Specifically they note that, “childhood and adolescence have become the sites for large scale engagement with multinational consumer culture and sophisticated engagement with new technologies and mass media” (Luke & Elkins, 2003). Two key factors that place them at risk are stress and boredom (Hall, 2003). Luke and Elkins make the connection between the lure of enticing media gratification and the boredom and stress of some schools when they state,

Where many youth in the middle years are not already ‘at risk’ in light of these new conditions, it is quite plausible that unresponsive, irrelevant and inflexible educational structures can make them ‘at risk’.

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**What is Education to Do?**

Education is left with three choices:

1) Ignore technology and increasingly personalized global culture and commerce.
2) Limit students from lure, because we, even though we don't know much about the online world, “know better”.
3) Use the power of personal technologies and rich media to engage students in meaningful and rich learning so that they are empowered to think critically make effective life choices.

The following project is made for educators who choose #3 ;-) 

**Pedagogical Foundation – Layers of Robust Theory**

**Can Schools Make a Positive Difference?**

If schools seem less relevant to the lives of learners and the acquisition of information, what is the most important, overarching contribution they can make?

**The Effect of Academic Optimism**

Socio-Economic Status (SES) has long been shown to have a direct impact on student achievement. Where students come from says a lot about how they will perform in school. Can attending school have a greater impact than SES and prior academic success? Although this seems a huge task, for schools to justify themselves, shouldn’t just such an impact be expected?

Research by Hoy, Tarter, & Woolfolk Hoy (2006) sought factors other than socioeconomic status (SES) that might explain why students at some schools demonstrate higher levels of academic achievement (2006). They have posited “a new construct, academic optimism,” and conducted studies “to explain student achievement while controlling for SES, previous achievement, and urbanicity.”

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**Academic optimism** made a significant contribution to student achievement controlling for demographic variables.
The construct identifies three “tightly woven” properties that work together to create a positive school culture that improves student achievement: “academic emphasis,” “collective efficacy,” and “faculty trust in parents and students.” Their research confirmed the construct.

Because this holds such potential for student achievement, all teachers at each of the schools participating in the current study will anonymously complete Hoy et al.’s “Organizational Health Inventory (OHI)”. This is a simple survey that yields scores in academic optimism. Schools will remain anonymous, but scores will be factored in to control for school effects and possibly lead to further research.

**Can Students Become Lifelong Learners?**

Because emerging technologies provide students with almost unlimited opportunities to both learn and amuse themselves, the fulcrum for making rewarding choices lay in motivation. Are students motivated to fulfill their potential or succumb to superficial distractions? Tied to this question is whether students are intrinsically or extrinsically motivated.

**Intrinsic Motivation**

More traditional approaches of extrinsic motivation can “produce immediate rote learning, but they impair conceptual learning and they lead to greater loss of the rote learning. Furthermore, they are associated with lower levels of self-esteem and higher levels of anxiety” (Deci & Ryan, 1985). Heavy use of extrinsic motivation, such as grades, high-stakes tests and punishment for poor performance, undermines psychological well-being and increase students’ likelihood to experience depression, anxiety and conflicted interpersonal relationships (Vansteenkiste, Simons, Lens, Sheldon & Deci, 2004). Significantly, the clinical manager of an addiction treatment service noted that “the desire to escape the routine, or stress, of life is a reason people become addicted to the Internet” (Hall, 2003).

Conversely, when student learning is encouraged through intrinsic motivation, the outcome is better. Vansteenkiste et al. conducted three separate studies that tested variables of “intrinsic goal framing” and “autonomy-supportive versus controlling context” and found a positive effect for each when used individually but when used together, the greatest gains
were achieved (2004). Specifically, improvements came in students’ self-reported depth of learning as well as objectively assessed academic performance in conceptual learning.

Thus, because our students confront innumerable choices, using a pedagogy that is both academically effective and contributes to positive well-being would appear to align with goals for students to develop the characteristics of lifelong learners. Ryan and Deci (2000) identify three key perceptions on the part of the individual that sustain intrinsic motivation. These are perceptions of control or autonomy; competence or self-efficacy; and relatedness or connectedness.

To make these gains more likely in the current study, students will have choices within an activity, receive online support so that they can experience themselves as capable, and work within an environment that promotes community. Through these and other means, the goal is to leverage the factors that sustain intrinsic motivation.

To measure of students’ perceptions of the key factors, they will complete pre- and post-tests of one or more of the following measures: the Intrinsic Motivation Inventory (IMI), the Academic Self-Regulation Questionnaire (SRQ-A), and the Learning Climate Questionnaire (LCQ).

**Can Students Develop Sophisticated Thinking Skills?**

Because young people use the Internet and other technologies, they need to develop sophisticated thinking skills for two main reasons. First, as noted in Beyond the Middle, they are among the most sought after and vulnerable targets for global marketers. Second, the very nature of the Web requires sophisticated thinking skills to make sense of what is an unstructured information source and ultimately unverifiable. What is the best approach to helping students develop such advanced thinking abilities?

The Delphi Report (American Philosophical Association, 1990) described the ideal critical thinker as one who is

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<th>Three Predictors of Intrinsic Motivation are:</th>
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<td>1. control or autonomy;</td>
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<td>2. competence or self-efficacy; and</td>
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<tr>
<td>3. relatedness or connectedness.</td>
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habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.

The literature of critical thinking has recognised that to achieve these goals, students need not only the capacity (or “skills”), but also the disposition to engage in such practices (Perkins, Farady, & Bushey, 1991). This involves both a sensitivity and inclination to engage in critical thinking (Perkins, Jay, & Tishman, 1993). These include such tendencies as to explore, to be curious, to clarify, to take intellectual risks, to be planful, to evaluate and to reflect. The pedagogical solution to develop thinking dispositions in students is to embrace the skill-centered approach within a context of enculturation. This model emphasizes “the full educational surround” and “asks teachers to create a culture of thinking in the classroom” (Tishman, Jay, & Perkins, 1992).

Two specific strategies will be used in the current study to promote a culture that encourages advanced thinking. First, based upon on-going research by Harvard’s Project Zero group, thinking routines, “simple patterns or structures, used over and over again, that support and scaffold specific thinking moves or actions” (Ritchhart, Palmer, Church, & Tishman, 2006). The primary purpose of the thinking routines is to make the “thinking of everyone in the classroom more visible and apparent” (Ritchhart, et al., 2006). One typical thinking routine that was particularly successful in the research by Ritchhart, et al. is the “SEE-THINK-WONDER” strategy (in which students in a class are asked: 1. What do you see? 2. What do you think about that? 3. What does it make you wonder?).

Built into the frequent use of several thinking routines will be an appreciation for, and retention of, the complexity inherent in a topic. When students pursue more than introductory knowledge on a subject and use the Web as information source, they engage in “advanced knowledge acquisition” in an “ill-structured domain” (Spiro & Jehng, 1990). Furthermore,
Spiro and his colleagues argue that poor learning outcomes are often the product of “the design of instruction which represent the instructional domain and its associated performance demands in an unrealistically simplified and well-structured manner” (Spiro, Feltovitch, Jacobson & Coulson, 1992). The model they developed was Cognitive Flexibility Theory, a constructivist approach that “emphasizes the real-world complexity and ill-structuredness of many knowledge domains” (Spiro et al., 1992).

To access student performance in critical thinking, two measures will be used. First, the Metacognitive Awareness Inventory (MAI) will be used as pre- and post-test. Second, a common concluding task will be designed that will be assessed externally using a critical thinking rubric.

**How can Emerging Technologies Support Student Learning?**

In the past five years new technologies have entered the lives of our adolescents. Lee Rainie, Director of the Pew Internet & American Life Project, neatly captures these changes in an article (Rainie, 2006) describing “Digital Natives” entering the workforce:

And at the dawn of high school for our worker in 1999, Sean Fanning created the Napster file-sharing service. When the worker graduated from high school four years later, his gifts might have included an iPod (patented in 2002) and a camera phone (first shipped in early 2003). Our worker's college career saw the rise of blogs (already two-years-old in 2000), RSS feeds (coded in 2000), Wikipedia (2001), social network sites (Friendster was launched in 2002), tagging (Del.icio.us was created in 2003), free online phone calling (Skype software was made available in 2003), podcasts (term coined in 2004), and the video explosion that has occurred as broadband internet connections become the norm in households (YouTube went live in 2005).

Common elements among these technologies are increased power, personalization and participation. In fact, so many new developments have emerged in recent years that popular consensus has come to refer to this new iteration as “Web 2.0” (O'Reilly, 2005). Core elements of this new movement include enriched browser-based interactivity (Google Maps), software that encourages user contribution (Wikipedia), network services that remix data from all sources, particularly user-generated data (the basis of the Google empire and motivation for its suite of “free” applications) (Hinchcliffe, 2006).
This study will use “Web 2.0” software to take advantage of digital technology’s power to engage students in personalised learning. Given the above review of the literature, the online environment will be designed to honor user-autonomy, facilitate achieving intrinsically motivated goals, and use community and social networking to promote rich, contextualised learning experiences. The technology makes such an approach possible, yet few who have visited MySpace, LiveJournal or Facebook would argue that providing youth with access to the technology alone produces anything approaching our goals of advanced cognition.

*How will Students Know How to Use the Technology to its Best Effect?*

The pedagogical solution is to provide an overarching framework that offers guidance for student-directed learning. The model is named CEQALL (pronounced “seek-all”) and stands for Choice • Effort • Quality • Attitude • Labor of Love.

**Choice**

For students to take ownership of their education, they must enjoy the opportunity to control the direction of each personal learning experience. Deci and Ryan’s Self-Determination Theory has shown that combining learner control with intrinsic goals produces increases in depth and retention of learning. Choice also suggests two aspects related to the curriculum. First, a range of activities are available to the learner – this is not a blank page where anything goes, but scaffolded activities that enable learners to encounter rich, contextualised endeavours. Similarly, learners identify the outcomes they want to master by choosing from a student-friendly version of locally chosen learning standards.

**Effort**

Once students have been able to find themselves in the learning goals, the next task is to apply Effort. Although this aspect is not overtly identified in either Motivation Theory or the Thinking Dispositions, clearly the competency / self-efficacy predictor of intrinsic motivation is not achieved without exertion. Likewise, the “planful” nature of thinking dispositions requires energy as does the advanced cognition of constructing meaning from complexity. Interestingly, the requirement of students to
invest Effort may be the most radical aspect of the CEQALL model in comparison to the traditional approach where students are expected to be passive and compliant.

The construct of Academic Optimism also illuminates the role of Effort. Hoy et al. chose the name for this organisational measure inspired by Seligman’s work on optimism and authentic happiness (2002). One aspect of Seligman’s research is that all three avenues to authentic happiness involve an expenditure of effort. Thus when students invest their best efforts in a task, it becomes meaningful through the process. Similarly, competence or self-efficacy is likely to increase through the very same effort. Third, by working together toward a goal, students develop feelings of connectedness.

**Quality**

Once students have been able to find themselves in the learning goals and expend substantial Effort, the next absolute is Quality. This is where a shift takes place away from the traditional schooling to personal learning. If a student chose their learning goals and invested their best efforts in the task, why wouldn’t they pursue a Quality outcome? There is no place for the busywork that primary serves classroom management goals. With students responsible for choosing their learning goals and outcomes, the teacher’s role is now – honestly – that of coach and mentor. Quoting from a colleague of Seligman, Csikszentmihalyi (1991) states, that when teachers “empower students to take control of their learning” their job changes,

“they provide clear feedback to the students’ efforts without threatening their egos and without making them self-conscious. They help students concentrate and get immersed in the symbolic world of the subject matter. As a result, good teachers still turn out children who enjoy learning, and who will continue to face the world with curiosity and interest.”

Thus the pursuit of Quality yields the twofold benefit of achieving the learning outcomes that are valued academically as well as personal well-being.

**Attitude**

Even after students have a Choice in their work and complete the activity in a Quality manner, the Effort has been misspent unless a positive attitude is part of the outcome. The Joy of Learning is a direct product of personal expressions (Choice) and best efforts (Quality). If the attitude isn’t right, the Choice and Quality weren’t honest.
Thus, the Attitude phase is an intentional point of reflection. In case learners have found it easier to “go through the motions” of Choice, Effort, and Quality, without honestly serving their own interests, their attitudes will show the truth. Teachers are likely to spend more time at this stage mentoring learners – as learners – not necessarily focusing on the content or outcome of the learning. This modeling and discussion of what it means to be a sincere learner makes overt the culture engendered by CEQALL. Like the Thinking Routines that carry the epistemic message of valuing thinking and learning, the CEQALL process emphasises that the students are important, capable individuals who are part of a collective effort to grow and learn.

As stated, Attitude serves as a reflection point along the CEQALL path. If all has gone well, students will have achieved a quality outcome and feel good about it. If their attitude lacks enthusiasm, they may decide to revisit any or all of the previous stages. Perhaps their Choice needs adjustment up or down. Maybe more or different Effort is required. Similarly, they might seek additional feedback, coaching or inspiration to create something of unmistakable Quality. Conversely, if they are so motivated, they might decide to continue on their current journey, pursuing deeper learning, advanced skills or public exhibition through a Labor of Love.

**Labor of Love**

Ultimately, happy and productive people are self-initiated. They get curious and engage themselves in the world and are a benefit to it when they make their contributions. Over the course of students’ middle and secondary education, they will find things that they are called to do. This already occurs in today’s traditional schools where exemplary students become local legends in musical composition, advanced maths, the visual arts. Some students find their niche and pursue their interests either through or in spite of their schooling. This connected, optimal experience that Csikszentmihalyi calls *Flow*, can be more widely available to all students if we allow them to explore their personal learning goals in an environment that supports and stretches their endeavours.
How would this Curriculum Look?

To take advantage of the richness and authenticity available when using the Web as a resource and medium for learning, a special Web portal is being created for the project. Playing off the idea of MySpace as a popular social networking destination for many teens and young adults, the content for this study is called MyPlace. It is an interdisciplinary year-long project that provides students with an opportunity to engage in a deep process of self-directed learning and self definition. More exploration than acquisition, MyPlace enriches students’ attempts to see themselves realistically and to find meaning within a personally relevant contemporary context.

Our students’ immediate future will be unlike anything we have experienced:

- the World Wide Web is set to morph into a personalised, WiFi-delivered, digital aura that hovers over our students, promising an endless stream of mesmerizing games, music, movies, and social networking opportunities. Why wouldn’t they want to “amuse themselves to death?”

- the “World is Flat” declares Thomas Friedman which suggests that all our graduates will enter a global workforce where they will both complete and collaborate with tens of millions of highly motivated and educated peers from countries like China and India.

- the geopolitical adventures of recent years promise decades of uncertainty and tension. How Australia chooses to participate in our region and globally will challenge our students values and courage.

- emerging changes in climate seem poised to radically alter the global landscape, affecting agriculture, commerce, tourism, water supplies and the very viability of many populations. Can we plan, adapt or merely survive?

See http://tommarch.com/myplace for more details on MyPlace.


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### CEQ•ALL Self Assessment Guide

<table>
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<tr>
<th></th>
<th>&quot;Playing School&quot;</th>
<th>&quot;Engaging the model&quot;</th>
<th>Tasting Initiative &amp; Joy</th>
<th>&quot;Self-initiated lifelong learner&quot;</th>
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<tbody>
<tr>
<td><strong>Choice</strong></td>
<td>Little energy went into choosing what to do. It was more like a “roll of the dice” or “following orders” than making a choice.</td>
<td>Some thought went into choosing what to do, but more personal reflection might have suggested other good alternatives worth considering.</td>
<td>Energy was invested in considering options before choosing what to do. The choice excited interest and prior learning.</td>
<td>The choice of what to do naturally flowed from previous experiences and long-standing interests.</td>
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<tr>
<td><strong>Effort</strong></td>
<td>Little effort went into the activity. This was more a “going through the motions” or a “get through it” experience.</td>
<td>Some effort was put into the activity, but it might have been inconsistent and occasionally lacking focus or care.</td>
<td>Effort was definitely put into the task. Time, attention and reasonable care describe the activity.</td>
<td>The effort invested in the activity shows full engagement in trying to master new learning. Focused attention and ongoing care defined the endeavour.</td>
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<td><strong>Quality</strong></td>
<td>“Quick and dirty” is probably a better description than “quality.” The task probably isn’t even completed.</td>
<td>The quality of the work may be below what could be expected, although aspects do show mastery of new learning.</td>
<td>The level of quality demonstrates achievement at or above expectations for someone at this level of learning.</td>
<td>The quality of the work goes beyond what would normally be expected. Attention to detail, creativity and personal interpretations are evident.</td>
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<tr>
<td><strong>Attitude</strong></td>
<td>Carelessness, apathy, low confidence, compliance or negativity might describe the attitude.</td>
<td>Willingness, cooperation, emerging confidence or only occasional inconsistency might characterise the attitude.</td>
<td>Optimism, engagement, confidence and consistency are regular attitudes.</td>
<td>Positive self-confidence and appreciation for others who have contributed are evident. Flow might have been occasionally experienced.</td>
</tr>
<tr>
<td><strong>Labour of Love</strong></td>
<td>Labour? Love?</td>
<td>There may have been moments when learning was an engaging experience.</td>
<td>The positive experience suggests similar endeavours might be enthusiastically pursued in the future.</td>
<td>Such engaged and self-initiated learning describes someone who sees the activity as a joy to pursue and a rewarding pastime.</td>
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