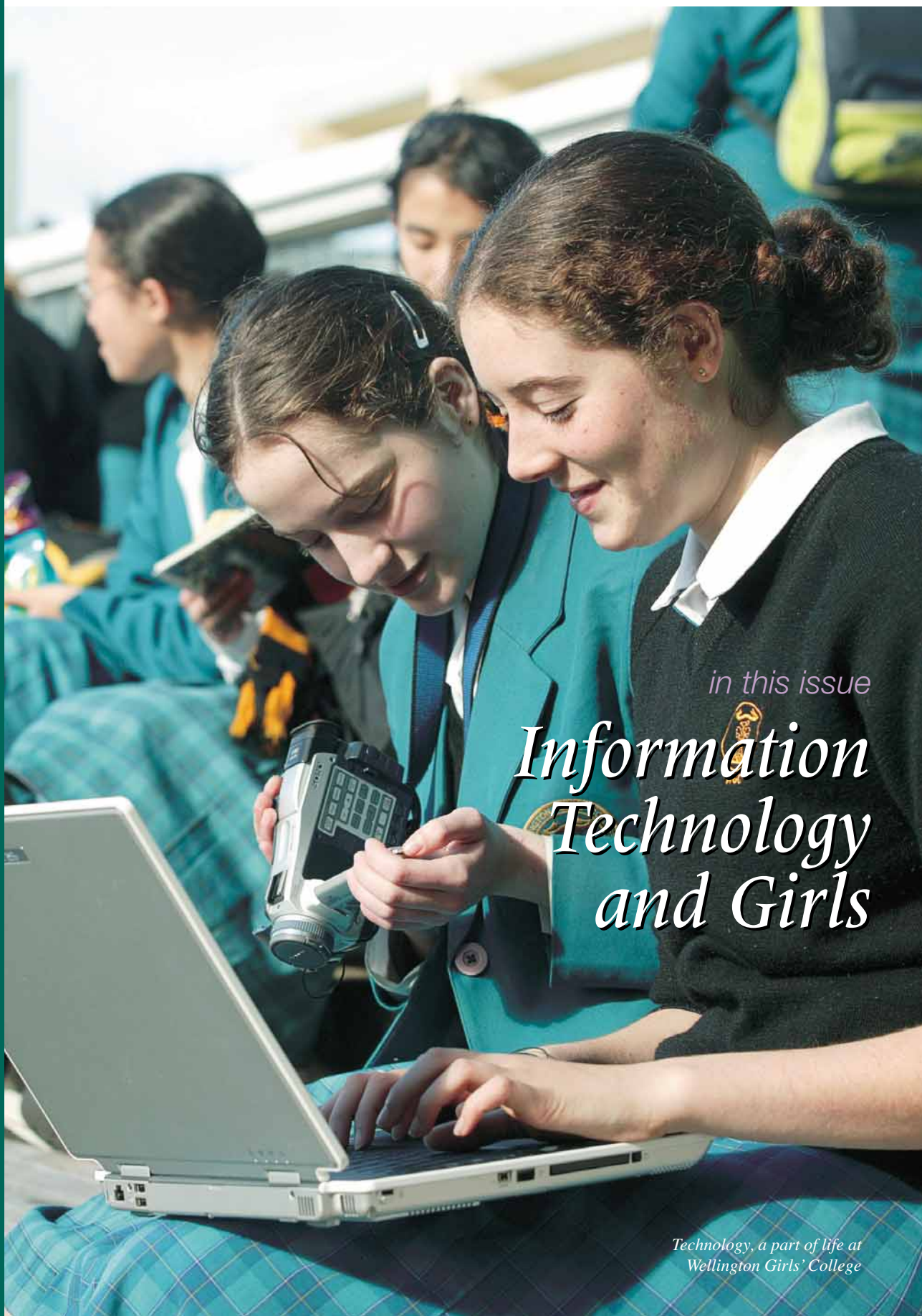
THE alliance OF GIRLS' SCHOOLS

in Alliance

Volume 31 May 2005



in this issue

Information Technology and Girls

Technology, a part of life at Wellington Girls' College

The Alliance of Girls' Schools
PO Box 296
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Australia

In Alliance 2005 Editorial Deadlines

VOLUME 32
Friday 29 July 2005
Girls and the School Environment

VOLUME 33
Friday 21 October 2005
Communication: Strategies that work

From the President...

Barbara Stone

The annual conference of the Alliance of Girls' Schools confirms our international character by meeting in New Zealand for the first time. I hope all our countries – South Africa, Hong Kong, Singapore, as well as the obvious Australia and New Zealand – will be there. St Cuthbert's College, Auckland, and the New Zealand conference committee are working hard to have every detail ready for us to be challenged by our speakers, to share our experiences in comfort and to return home refreshed and ready to take girls' education to new heights.

Our conference theme, *Healthy Women: Healthy Girls*, is for us and our staff, as well as for our students, as we seek balance in our lives. The themes are universal but this time delivered with a distinct New Zealand flavour, as notable speakers from New Zealand government and institutions bring us their view of the same challenges we all face. The taste, not just of the wonderful New Zealand food and wine, but of other aspects of the culture too, will no doubt be a highlight we won't soon forget. The conference has been timed to allow going on to Nashville for the National Coalition of Girls' Schools annual conference too.

Our very good Executive Officer, Marita McMahon Ball, unexpectedly resigned to accept a position with the Australian Council of Educational Research, leaving us at Easter, with our best wishes for her new position. Fortunately we have been able to secure the services of Judith Wheeldon, who has just retired from 20 years of headship in three girls' schools, mainly at Queenwood and Abbotsleigh in Sydney. Judith was there at the founding of the Alliance and has always supported girls' education strongly. As Executive Officer pro tem, Judith has assisted with conference arrangements from the Australian side and has edited the last issue of *In Alliance*, all done on very short notice. We thank her for stepping in while we advertise and make a permanent appointment.

See you at the Conference.

Barbara Stone

Barbara Stone

From the Editor...

Judith Wheeldon

Hello, Colleagues! It is a surprise to find myself as Alliance Executive Officer after thinking I had left girls' schools. Although I will sing the praises of retirement and claiming back a piece of life for oneself, I have missed our professional and personal camaraderie and sharing of experience. It is a pleasure to work with you all again, even if only briefly.

Unfortunately, I have pre-existing plans that cannot be cancelled so I will not be with you at the conference or at the Coalition conference but I look forward to editing *In Alliance* with your reports and photos. Please send them in early and well identified as to author, subject of photo and any other relevant information.

In addition to reporting on the conference, the theme of the next *In Alliance* will be "Girls and the School Environment". Your articles, photos and suggestions are eagerly sought. This is a chance to recognise the work of colleagues by inviting them to write for our journal. Please ask potential writers to email me for a copy of the Format and Style Guide before submitting their work. This is a document in its infancy that will develop over the next year as an important tool for improving the quality of *In Alliance*.

It was a great step forward when the Alliance of Girls' Schools, founded by independent school heads, opened the doors to all girls' schools, Catholic and state schools included. Please may we have more contributions from our state school and Catholic colleagues to show the great variety and scope of girls' education. We are all in this together. *In Alliance* should reflect our variety.

Judith Wheeldon

Judith Wheeldon

The Alliance Student Leadership Conference 2005

Leadership is one of the prime concerns of girls' schools. Encouraging girls and women to develop knowledge, understanding and skills means urging them to go out into the world, to act in the world, to lead.

The Alliance of Girls' Schools teaches leadership in many ways. One of the most direct is the annual Student Leadership Conference, a residential convocation for senior students that focuses on understanding leadership and developing skills and confidence. Sharing experiences with peers and invited 'experts' is a highlight.

Senior girls from all Alliance member schools are invited to attend. Many schools make it a policy to send, often at school expense or subsidy, the following year's senior leadership team, as well as others who elect to go. The timing in the summer holidays makes the SLC ideal for helping the new school student leadership assume responsibility in a healthy and productive way.

Pymble Ladies' College (Sydney) has played host to the SLC since its inception in 2000. The Alliance is grateful to Mrs Gillian Moore and her staff for attending to every detail to make the conferences good, better and best. The spirit of the Alliance, however, is to give others a chance to grow through facing challenges, so in 2005 Melbourne Girls' Grammar, South Yarra, and St Catherine's School, Toorak, shared the challenge.

By all accounts, both schools provided exceptional support, wonderful facilities and a very high standard of catering for the 131 conference delegates from Australia, New Zealand, South Africa and the United States.

The Alliance would like to thank Christine Briggs, Janet Maher, Angela Raven and Maura Milanovic from Melbourne Girls' Grammar and Laraine Sharr, Mary Close and Sue Collister from St Catherine's School for the creative energy they expended in making the conference another success.

The Brisbane based Synergy team, who have run the SLC since its inception in 2000, packed their bags and travelled to Melbourne to hone the leadership talents of our 2005 school leaders. An increased emphasis on the value of mentoring and the power of networking gave the girls new tools for leading rather than bossing.

Insight into the complexities of leadership in a large accounting firm came when students spent an afternoon exploring leadership challenges with staff members at Deloitte Touche Tohmatsu. Dinner at University College, a residential college of the University of Melbourne, was one of many highlights of the conference.

The following pages include excerpts from the students, who relate some of their conference experiences. They speak for most conference participants and are an endorsement of the value of the conference.

Georgina Furniss of Chilton St James School in Lower Hutt, New Zealand sets the scene for us:

Imagine meeting some of the friendliest, most enthusiastic and motivated girls in the whole world. Imagine being surrounded by girls just like you who want to make a difference through leadership. This was the reality I faced attending The Alliance of Girls' Schools Student Leadership Conference in January 2005.

This year the conference was held in Melbourne and attended not only by girls from every area of Australia, but also by 12 New Zealanders, two girls from South Africa and two from the United States. Being a New Zealand student I was part of this 'International' group and I have to say that the thought of having to meet and live with so many 'Aussies' was a little daunting at first! However, I can safely say in hindsight that I needn't have been concerned as I was to have one of the most memorable, inspirational and exciting times of my life with these girls.

For the week we were divided into random cohorts, which provided a good cross-section of diverse individuals and allowed us to get to know the girls in the groups really well. In these groups we participated in exciting activities, both inside and out-of-doors, designed to focus on developing our skills in effective leadership.

We learned about the power of networking, having a sound emotional intelligence, team work, trust and how to deal with conflict. These lessons were incredibly valuable and more than anything, the discussions and ideas which arose from the girls in my cohort during the course of the week were truly enlightening and interesting.

Although these activities were brilliant and I learnt so much about leadership, I would have to say that it was not from these that I gained the most valuable lesson. What I believe to be the true essence of leadership is working with others towards a common goal, and most of all enjoying the time spent on the journey there.

My week in Melbourne was the beginning of a journey, a journey down the path to becoming an able, conscientious leader who is able to work with amazing, dynamic girls.

The most profound conclusion I left the conference with is that leadership is about taking risks and meeting new people; it is about trust and having fun. I have returned home to New Zealand truly inspired and ready to accept all the challenges that being Head Girl of my school will present.

Sometimes stepping back and letting others have the opportunity to lead is the best form of leadership.

Phillipa Kirschner and Amy Flatau of St Stithian's Girls' College in Johannesberg, South Africa, agree as they discover the challenge of a new culture far from home:

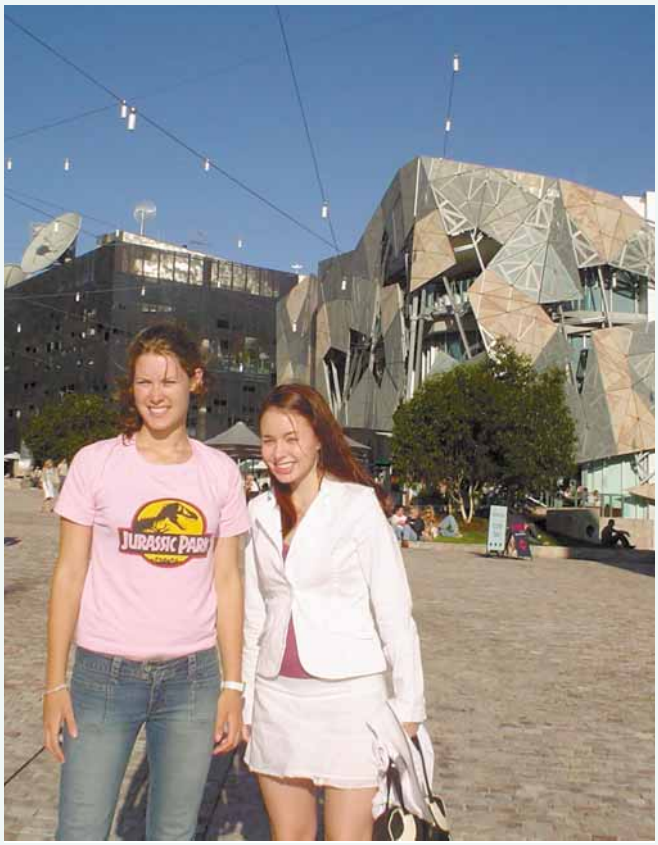
The Alliance of Girls' Schools Student Leadership Conference held in Melbourne was an amazing experience that a pair of South Africans will never forget.

Upon arriving at the conference we felt slightly out of place, after realising that we were staying in different schools surrounded by Aussies. It took a while for both of us to become accustomed to their unique accents and interesting mannerisms; understanding the conversations with them was somewhat of a challenge!

We had a number of questions thrown at us concerning our languages and culture, which came as a shock. The most commonly asked question was: "Do you speak South African?" We presumed that the Aussies would know a bit more about our country, especially in view of all the sport we play against one another.

As the conference progressed it became a little easier for us to understand what was being said and we began to make closer friendships. Being part of the 'International Team' along with the New Zealanders and the Americans proved to be a lot of fun as we could have a laugh together, at the expense of the Aussies.

Looking back on the five days of the conference we have realised how many priceless lessons we learned and how many life-long friends we have made. Thank you to The Alliance of Girls' Schools for this opportunity!



Our American colleagues, Lauren Schoettle from Castilleja School, California, and Lauren Wilhelmi from the Emma Willard School, New York, prepared the following list of leadership characteristics while they reflected on the value of the conference during the long flight home:

1. Leaders need to know that they can lead from the bottom as well as from the top. Sometimes stepping back and letting others have the opportunity to lead is the best form of leadership. As an anonymous author once wrote: "Part of leadership is creating more leaders, not followers."

2. Leaders need to prioritise and balance their lives in order to stay healthy and have time for relaxation. A leader must not be afraid to say 'no' to taking on too many responsibilities.

3. Leaders should be enthusiastic and passionate in order to spread motivation in a positive direction.

4. Leaders should be flexible and open-minded in order to encourage new ideas.

5. Leaders need to be confident and comfortable in their beliefs and choices. They should not waiver or question themselves, but should remain confident in their values and decisions.

6. Mel Gibson said in the film *The Patriot*: "Aim small, miss small". In order to be more efficient a leader should strive for specific goals instead of broad goals.

7. Leaders should always take time out of their days to help others. When asked for advice, leaders should be honest. People will value openness and honesty more than superficial compliments.

8. Leaders need to take initiative and accomplish goals in order to build trust in others. (However a leader cannot be too overbearing.)

9. Leaders should not be afraid to take risks but should openly embrace challenges.

10. Another unknown author once wrote: "A mistake is a fact of life; it's the response to the mistake that counts." Leaders should know that mistakes will occur, and should therefore learn from mistakes rather than become discouraged or afraid of them.

11. Leaders should always put themselves and their desires second to those of the people around them in order to build better relationships and trust.

An Australian viewpoint comes from Siobhan Toohey, Santa Maria College, Northcote, Victoria:

To be quite frank, when I heard about the Student Leadership Conference Stephanie, my vice-captain, and I would be going to, there was not a lot of excitement! Rather I was extremely apprehensive about the whole idea, and dreaded the thought of spending five days and four nights with girls who were complete strangers. So I approached the upcoming week as a duty, but at the same time decided that no matter what, I would get all that I could out of this experience. Like my school's motto, I would "dare to do".

While fear is certainly not favourable, in this case it was rewarding, for it meant that my whole week at the conference was the exact opposite to what I imagined. Perhaps the most unexpected and inspiring part was meeting the other girls. Suddenly I was surrounded by girls who all shared the same hopes, dreams, concerns and responsibilities for their leadership year and were in exactly the same situation as I was. I quickly learned of the many similarities and contrasts between their experiences and mine, and enjoyed sharing ideas. Their enthusiasm, commitment and individuality made a lasting impression on me, and set a really positive tone for the week.

After only one night at the conference, I felt like I had lived with these girls for weeks. Already we had passed that stage of getting to know one another, and instead looked towards the next step, making the most of the coming week. Indeed there was little time to stop, with sessions and activities taking up most of our days.

The Synergy leaders were brilliant in the way they helped us reflect upon the coming year, and come up with ways to approach it. They challenged us, yet gave us room to be independent, and time to reflect and discuss in our groups.

Of the many fears and challenges I will have to overcome during my leadership year, perhaps my biggest will be to have the confidence, belief and faith in myself to be the leader I dream of being.

Of the many fears and challenges I will have to overcome during my leadership year, perhaps my biggest will be to have the confidence, belief and faith in myself to be the leader I dream of being. Naturally I want this year to be as successful as possible, but there are times when that irrepressible feeling of self doubt creeps over me, and I cannot help but question whether this is the right time for me to stand up and take responsibility.

It is because of the Student Leadership Conference that I can now say that whether it is the 'right time' or not, I am in this position for a reason. We all have different ideas about what a leader should be, but in the end we must remember that we are not alone, and have networks of friends and family to rely on. Teamwork, I learned, is of the essence, and if we set realistic goals at the beginning, we are on the way to achieving something worthwhile at the end.

Profiles

A prominent young woman

Councillor Clare O'Neil

A remarkable young woman, Councillor Clare O'Neil, was the guest speaker at the Students' International Women's Day celebration sponsored by the Victorian Alliance of Girls' Schools members and held at Melbourne Girls' Grammar. The keynote speech, "Getting in the Driver's Seat" was given by Councillor O'Neil, whose profile is worth reading.

Clare O'Neil is 24. At the age of 23 she became Australia's youngest-ever female Mayor when she was elected as Mayor of the City of Greater Dandenong. The confidence and responsibility that were placed in Clare at such a young age are testament to the contribution youth can make to our society.

Clare's professional interests lie in public policy, the law and politics. She enjoys robust debate and talking to people who have ideas different from her own. To pursue these interests Clare, after leaving school, began working for Members of Parliament and was elected to Council in Greater Dandenong when she was 22.

Achievement in the political world has been accompanied by Clare's academic success as an Arts/law student. This year she will complete her final year Law subjects, undertake an Honours course in Australian History and study for a Diploma in Company Directorships through the Australian Institute of Company Directors. She is a member of the Golden Key Academic Honour Society.

Volunteer work has also been a priority of Clare's. She is a Board Member of Jesuit Social Services, Vice-President and Committee Member of Springvale Community Aid and Advice Bureau, a Board member of VisyCare Youth Assist and a Board Member of Springvale/Monash Legal Service. These Board positions are complemented by several practical examples of volunteer work. These include teaching English to Afghan 'Temporary Protection' Visa holders, providing social contact and support to people at Flinders Street Station and being a McHappy Day volunteer.

To this list of achievements could be added Clare's publications, presentations and participation in such programs as the Cranlana Colloquium.

Clare also enjoys an active social life and has a wide group of close personal friends.

A member school

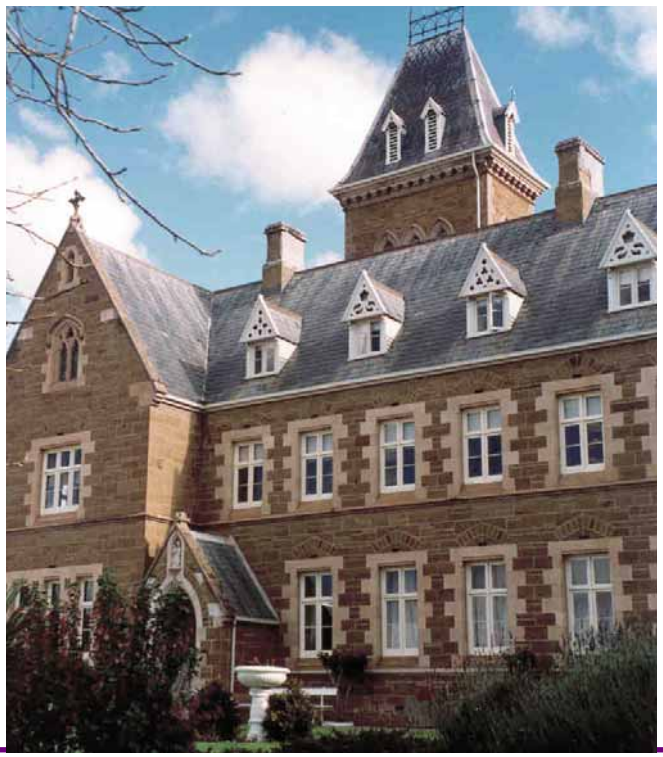
St Mary's College, Hobart

St Mary's College in Hobart is a Kinder to Grade 12 Catholic girls' school founded by the Presentation Sisters in 1868 on its present site – which is dominated by a wonderful sandstone convent building designed by famous convict architect Henry Hunter. The historic fountain in front of the building has recently been renovated, and visitors are greeted by a beautiful, heritage-protected precinct as they come to the main office.

Today, we have over 770 students from Kindergarten to Grade 12, with boys from Kindergarten to Grade 2.

As the only Catholic school in Tasmania which caters for girls from Kindergarten to Grade 12, the students in Grades 11 and 12 at St Mary's College have a unique opportunity to develop their leadership skills, with a Prefect system, a Big Sister program and the opportunity to take the lead in the many celebrations and liturgies which are celebrated in the Cathedral right next door.

Another of our strengths is our pastoral care program, with many visitors commenting on the warm "family" atmosphere around the campus. The foundress of the Presentation Sisters was an Irish lady called Nano Nagle who was totally committed to the the oppressed and uneducated in eighteen century Ireland. This commitment is firmly embedded in the College's vision as a caring community, and is put into practice in practical and generous ways by welcoming students from successive waves of refugees settling in Tasmania. Over the years, these have included students from Vietnam, El Salvador and more recently from Sudan and Rwanda. The College community is enriched by the presence of these different cultures, and by the opportunity to give support and comfort to those who have suffered so much.



The College has made a significant commitment to the arts, with a purpose-built Design in Wood Centre - a state of the art workshop allowing students to develop practical and design skills while they work independently and cooperatively on beautiful, functional objects. The main lesson here – girls can do anything!

With the College's long-standing tradition of providing a complete education for girls, St Mary's is very proud to be a member of The Alliance of Girls' Schools.

An author in this issue

Jacqueline Harvey,
Deputy Head of Abbotsleigh Junior School

Jacqueline Harvey has combined a successful career in education with her love of a good story. She credits winning the aptly named CBCA Frustrated Writers' Competition in 2001 with helping turn her dreams of being published into reality.

She is Deputy Head of Abbotsleigh Junior School in Wahroonga, NSW, and says that being a teacher gives her a lot of ideas for her stories. Her first book, *Code Name Mr Right* was published by Lothian in 2003 with the sequel *Code Name Unwanted* released last year and the third, *Code Name Rescue*, due for release in June.

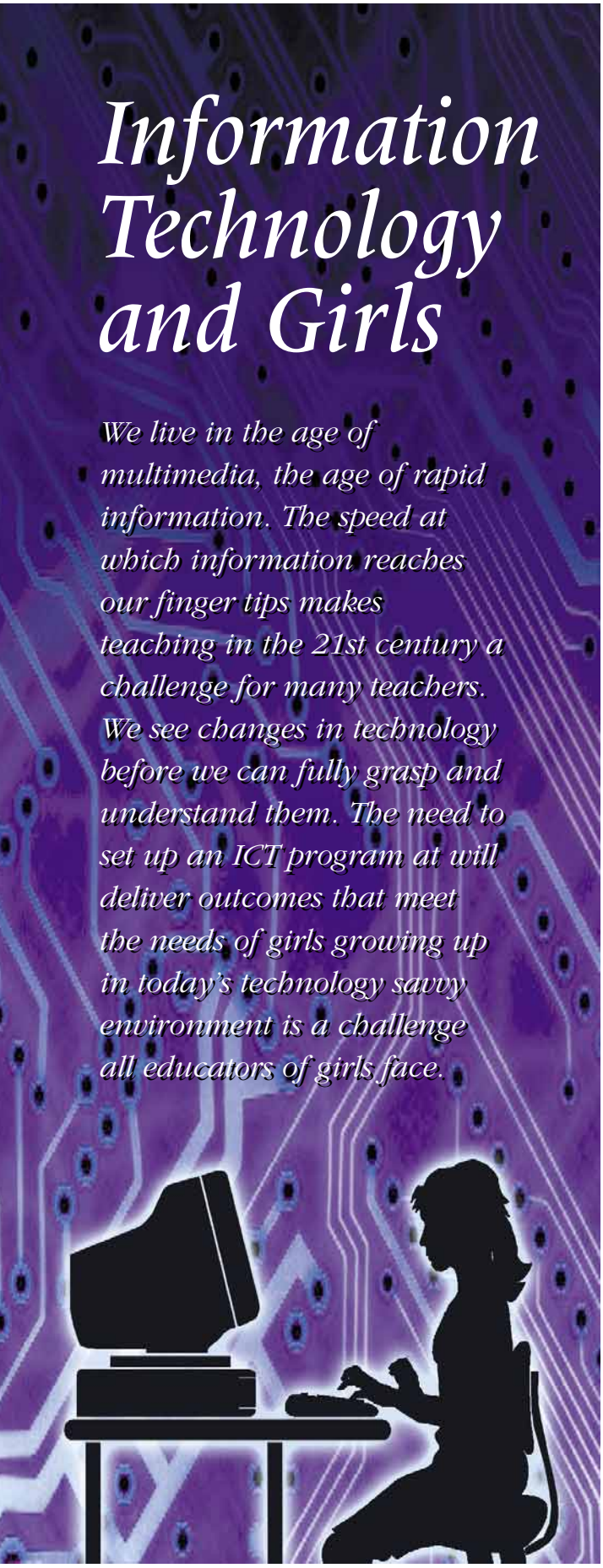
In the *Code Name* series, young readers will laugh out loud as they follow the adventures of Penelope Estella Grace Scott (also known as Snot!). With her best friends, Kimi and Andrew they are a formidable team of matchmakers, world travellers and ultimately life savers.

Jacqueline's first picture book, *The Sound of the Sea* was released in January. It explores the relationship between a young boy and his mother. Although Sam is devastated when his mother becomes ill and is ultimately taken from him, he finds comfort in the relationship with his grandparents, his memories and the sound of the sea.

Currently Jacqueline is working on her first young adult title to be released in 2006.

Noted presentations include: Children's Book Council Island Journeys conference Hobart 2003; All Saints' College Literature Festival Perth 2004; Sydney Grammar St Ives Festival of the Arts 2004; and the Somerset College Literature Festival Gold Coast 2005.

For more information on Jacqueline go to www.jacquelineharvey.com



Experiential learning, ICT, creative writing, research and adventure all rolled into one

By Jacqueline Harvey, Deputy Head, Abbotsleigh Junior School

The goal

As a passionate supporter of experiential learning which provides students with the opportunity to participate in authentic projects with real outcomes, I have long held a belief that children learn best when they are given the opportunity to take risks in a safe and supportive context. Experiential learning empowers the learner and inspires them to achieve beyond the realms of the ordinary.

Armed with these beliefs, late in 2002, I began to think about how I could more fully involve my 2003 Year 5 class in my writing. It became my goal to take them beyond being attentive listeners and eager critics to give them a real role in the launch of my first book, a junior fiction novel called *Code Name Mr Right*. I wanted to share with them the excitement of achieving a long held goal and hopefully in the process inspire them to believe that they can achieve anything they set their minds to—be it now or later in life.

The project

The resulting project involved the students in both individual website production and the collaborative development of the author website www.jacquelineharvey.com which was launched in conjunction with *Code Name Mr Right*.

As a complete novice in the area of web design, it was imperative that I reassured the girls that we would 'think big but start small'. The project was going to take place over an extended period of time with the launch deadline in August. There were numerous experts within the school who could answer our questions and help us along the way.

It was very important that the girls weren't overwhelmed by the project and that they could begin to see that it was in fact possible to achieve. Their initial responses when I talked about the idea ranged from total disbelief, shock and horror to 'Cool... but how?'. The idea of giving them small chunks of information became central to the project's success.

There was lots of planning to be done and the idea was that the students would take a great deal of responsibility for their own learning. From the outset, I introduced the concept of a journal and told the girls that this was an essential document in which they could write anything and everything about the project. They were to reflect often on what they were achieving and any problems they faced.

The next phase of development was to share with the girls a draft design brief and timetable. Each week there would be goals to achieve and hence small steps would be taken towards our end product.

We were determined that the girls would not only cover curriculum outcomes in English and Mathematics but that the project should also help them in their social development including leadership, team cooperation and "professional behaviour". For example, social etiquette protocols became an issue with regard to when the author would be available to the students and how they could identify her in that role, as opposed to her role as the classroom teacher.

This was thrown open to discussion with the group. The girls suggested

that when the author was available they should be able to call her 'Jacqueline' and ask her for information which they could then use in the development of the website. But there had to be an easily identifiable way to delineate the two roles of teacher and author. At a staff social event I was given a hot pink feather boa – it was the perfect, immediately recognisable signal that the teacher was now the author and was available as such. The girls loved this symbol and never once throughout the entire project did they use this less formal relationship inappropriately.

The project then moved through several key stages. Initially time was spent researching and critiquing existing author websites. This included the girls writing and sending out surveys to other students external to the school and then collating the information they received. They were also introduced to various research techniques such as measuring data using Likert scales which enabled them to monitor attitudes toward key features of the websites, from colours and layouts, to information, contacts, interest etc. The SmartBoard (an interactive whiteboard) was employed to jointly critique an existing website and discuss features that were liked and disliked.

...children learn best when they are given the opportunity to take risks in a safe and supportive context.

Following on from this initial research the girls were then required to brainstorm the pages they believed a website should contain. This was done using Inspiration software and the SmartBoard. A De Bono 'thinking hats' activity, whereby the girls worked in teams according to the thinking hats enabled them to evaluate the effectiveness of their ideas and look at things from varying perspectives.

The girls were then given the opportunity to explore the web building software, FrontPage; and several weeks were dedicated to finding our way around this program. The design brief then required the girls to each build a minimum two pages of an individual website about Jacqueline Harvey. During this time they had to interview the author and ask her information which they could perhaps use in their site. Each of these sites was then critiqued and features were identified as desirable/undesirable. This was a lengthy process as it was crucial that each site be given the same due consideration. Again the SmartBoard technology was employed.

After critiquing the sites the girls were asked to think about the way a commercial web design company might operate in terms of responsibilities. We spoke with some experts in the field and determined that the most effective way for the class to work would be in teams with specific roles. The class brainstormed a list of teams and the girls were asked to nominate their first three choices.

The teams consisted of an Information Team with a manager, journalists, editors, client liaison and researchers, and an Interactive Team with a manager, graphics, interactive and layouts teams. The Interactive Team also required the services of a Technical Manager who was able to troubleshoot. We identified the need to document the project and also make video and audio to insert into the website. Two video teams were created: one being responsible for materials to be uploaded to the site and the other for documenting the project.

With a tight time frame in place the girls worked during the allocated class time of an hour and a half per week but also attended several voluntary weekend and holiday workshops. Each team worked on their area of responsibility although the editors and researchers crossed over to assist other teams in the early stages.

As time progressed we became aware of several technical issues such as compression of photograph and video files in order that they would load at a reasonable speed. We also became aware of things like metadata and the process you must undertake to ensure that your website is recognised by the various search engines. These issues only became understandable when the site was loaded to the web.

There was an enormous amount of trial and error in the development of the site, and we sought assistance from experts within the school wherever possible.

What did the students learn?

Rather than relying on my intuition and the girls' reflective journal statements, I became aware that a more formal method of evaluation was required if I was to gain a reliable and detailed picture of the benefits of the project. This information would not only help confirm and illustrate the benefits I thought were taking place, but also provide me with information that could be used to tailor future project initiatives.

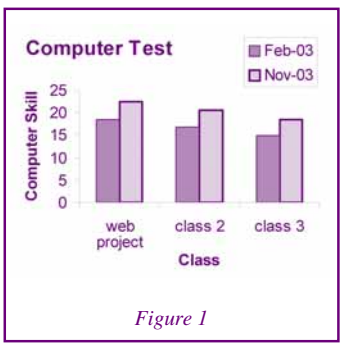


Figure 1

To determine changes in students' academic and personal development, both pre and post testing was used in the form of formal assessment and self reporting measures. We also administered the same testing to two of the other Year 5 classes in order to have a control group. Student performance on the Standardised UNSW Computer Test confirmed the positive acquisition of computer skills for the web project class, although as illustrated in *Figure 1*, this increase was also evident in the two other classes that were involved in different learning activities involving computers. What proved to be most striking was the significant difference between the classes in the students' confidence to use computers.

The qualitative data supported the observed changes in personal, organisational and social development as illustrated in the following student's comments recorded in February and September:

"I don't know very much at all about computers... I'm also pretty scared and hope that I can do it because I've never even been on the Internet and I haven't dreamt of designing a website." Student A, February 2003

"I've learnt that if we all put our heads together we can do it... The best thing about the web project was finishing it and being amazed at what we had created... I learned heaps and I loved the experience." Student A, September 2003

When asked to report on three key benefits from the project (*Figure 2*), the class identified the development of ICT skills, social team skills and friendships closely followed by confidence as the main benefits. Consistent with their daughters' responses, parents identified ICT skills, social team skills and confidence as accounting for the most significant benefits of the project. (*Figure 3*)

An insightful parent comment captures the essence of the team: 'There was a sense of belonging to a socially cohesive group… strong friendships were formed between members of the class.'

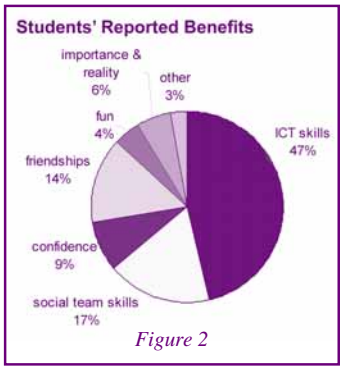


Figure 2

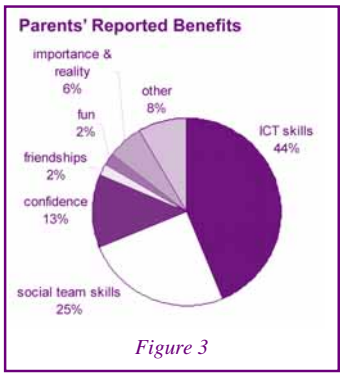
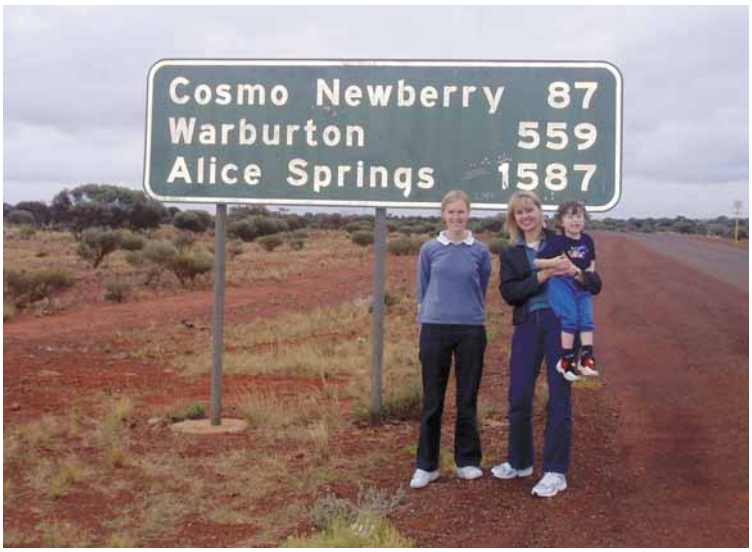


Figure 3

What did I learn?

During the project I learnt that not having the requisite ICT skills to develop the website from the outset was not a barrier to success. Although some areas proved more of a challenge than others, I was able to develop my skills as the project progressed. For me, the project highlighted and reinforced the importance of developing sound cooperative skills—for both the students and adults alike.



Other opportunities

The project has opened a number of doors in terms of my own professional development. In October 2003, I was a speaker at the Children's Book Council Conference in Hobart and also presented at the 2004 Abbotsleigh AbbSearch Conference. In March last year I was invited to speak at the All Saints' College Literature Festival in Perth and this year I participated in the Somerset Celebration of Literature on the Gold Coast. Many of these experiences have resulted in some way from the web project.

The most personally satisfying extension to the project to date has been the opportunity to work at a very small school in outback Western Australia. Following the All Saints' College Literature Festival last year I spent a couple of days teaching in Laverton, a town of about 500 people 750km north east of Perth. My visit was facilitated by Anglo Gold Ashanti, a major sponsor of the Festival and the owner of a large gold mine, Sunrise Dam, which is located about 45 minutes drive from Laverton.

During the project I learnt that not having the requisite ICT skills to develop the website from the outset was not a barrier to success.

The idea behind the visit was to give the students at Laverton the opportunity to have an author in residence—something which we take for granted in the city but as you can imagine is far more difficult to orchestrate for students living in such a remote location.

I was determined to establish an ongoing link between Laverton and Abbotsleigh as I strongly believe that this relationship will assist Abbotsleigh girls to gain a greater understanding of the way people live in different parts of Australia and develop an empathy and affinity with our indigenous people while also broadening the experience of the Laverton students and helping them to gain a greater understanding of life in a large city.

I have always been a firm believer that children are children no matter where they are—it's the level of opportunity they are afforded which really makes a huge difference to their lives. The kids at Laverton were so excited and grateful to have a visitor all the way from Sydney. For my part, I was extremely excited and grateful for the opportunity to travel there and to subsequently share this experience with the girls at Abbotsleigh.

Since my initial visit I have travelled to Laverton again in October with an Abbotsleigh colleague. We were able to teach in the school for a week and further explore possibilities for collaborative projects between the two schools. At present the Kindergarten students at both schools are preparing their 'travelling teddies' for a term long exchange program, and students in Year 3 are corresponding with pen pals. The project has extended further to include a group of students from Kalgoorlie South Primary who are establishing pen pal friendships with the Abbotsleigh Year 5 girls.

In late 2004 Laverton underwent a major technology upgrade as part of the 100 Schools Project funded by the WA Government. With improved email access, the students have been increasingly able to communicate online. In order to further facilitate this communication, 10% of the sales of my second book, *Code Name Unwanted* have gone towards purchasing web cams for Laverton and to improve their library resources.

Designing an IT Curriculum That Appeals to Girls

Integrating Technology at Wenona *By Michael Beilharz ICT Curriculum Coordinator, Wenona, North Sydney, NSW*

We must not assume that the future of the Internet will be determined by some mindless, external 'technological imperative'. The most important question is not what the Internet will do for us, but what we will do with it.

Robert Putman, Bowling Alone

Wenona is an independent girls' school in North Sydney catering for students from Kindergarten to Year 12. Providing 1:1 access to computer technology has been a major feature of the school since 1995. Currently, all girls from Years 6 to 10 use school-owned laptops. It is the curriculum needs of our students that drive the integration of technology. Current practice and future planning which recognise the exciting opportunities created for learners are the focus of technology at Wenona.

Information, Communication and Technology (ICT) at Wenona has always been designed with the curriculum in mind. The integration of technology allows us to explore innovative methods of teaching which develop different approaches to thinking, learning, knowledge construction and understanding. ICT facilitates co-operative and collaborative learning across multiple settings and removes the constraints of the traditional classroom. ICT at Wenona develops technology skills that will allow our students to learn "anytime anywhere", by embedding technology into their everyday learning.

Computing stretches further than merely computer science. Today, many non computing jobs also require an understanding and an ability to adapt technology into them. For girls to receive equal weighting when applying for future jobs, their understanding of technology must mirror that of their male counterparts. Therefore, when we address the question of ICT for girls, it is important to think of how access to technology can provide equal opportunity and give our girls' an advantage in a society where technology is still seen as a male dominated environment.

Providing staff with skills that will allow them to lead by example is of paramount importance. Over the past years, teachers have been faced with significant changes in curriculum, pedagogical theories, as well as information technology. Developing a curriculum that meets the needs of our students depends also upon staff developing their own learning experiences and passing these on to their students.

It is important that girls see women modelling the successful use of technology. Schools need to invest time and resources in training staff. A good ICT curriculum depends upon how it is delivered, its educational benefit and its ability to provide authentic experiences.

We live in the age of multimedia, the age of rapid information. The speed at which information reaches our finger tips makes teaching in the 21st century a challenge for many teachers. We see changes in technology before we can fully grasp and understand them. The need to set up an ICT program that will deliver outcomes that meet the needs of girls growing up in today's technology savvy environment is a challenge all educators of girls face.

> *For girls to receive equal weighting when applying for future jobs, their understanding of technology must mirror that of their male counterparts.*

Unlike boys, girls are not generally as interested in the common computer games found for sale. Therefore, the technology curriculum needs to focus on activities that gain their interest and tune into their motivations. I have found that girls are able to work confidently and reflectively on activities they produce collaboratively. Research findings tend to agree that girls' interest in technology is different to boys. Girls tend to emphasize relationships, interaction, communication, cooperation and inclusion. When developing ICT activities, we should consider these basic differences. "Models of learning involving the social interaction of peers, the scaffolding by more able peers and the use of language as a mediation tool of cognitive development all have opportunities of enactment through the use of technology used in the right way." (Vygotsky).

We provide programs in which technology is not simply used as an instructional delivery system, but as part of a blended frame work. Capturing students' imagination and allowing them to express their ideas and thinking, through the use of multimedia, appeals. Of interest is the making of movies as a means of learning and presenting work. This brings meaning to their learning, as they are able to present work in a way that is relevant and worthwhile to

them. Making movies also provides an opportunity for girls' varying learning styles to be addressed. Those who are more musically inclined are able to work collaboratively with someone whose thinking is more systematic or dramatic.

However, classes such as these need to be well structured and teachers have found that supplying girls with resources and limiting their need to search on the internet can greatly reduce the time girls spend on a task. To this effect, the Commerce Department recently developed a website that contains a series of interactive tasks, teacher resources and student help guides based around the Law in Action topic. All resources are provided on the website within our intranet and girls work collaboratively in producing a product.

The use of multimedia has allowed Year 4 students and their parents to view news report presentations from home. By filming students' news reports, we enabled parents to view their children's work from home and actually become part of the assessment process by providing helpful comments. Students were then able to re-evaluate what they had produced and make modifications to their original presentation. This use of a multimedia tool is allowing real learning to occur.

At Wenona we are ready to move towards greater integration of technology as a learning tool. The ability to use discussion forums to construct knowledge is an example of using technology as a tool for cognitive thinking and not simply as a presentation aid. Developing the use of cognitive tools within an educational environment allows us to cater for different learners and learning styles.

Other ways in which we are furthering girls' use of technology include:

- Image manipulation
- Flash animation
- Inspiration mind maps
- Digital Novel studies
- Digital portfolios
- Online learning with digital content

Technology has swiftly become a part of everyday life. When I tell my Year 7 Science class that I grew up without a mobile phone, DVDs or an MP3 player I hear gasps of disbelief. The future lies in technology and as educators of girls, it is our responsibility to support them in all areas of learning and give them the best start in life we possibly can.

Korowa Transforms

From Korowa Anglican Girls' School, Glen Iris, Victoria

Curriculum design has gone through a massive transformation over recent years. The literature continues to grow on the need for student centred learning, embracing the thinking curriculum and appealing to multiple intelligences. A new curriculum framework for Victoria challenges learning to be about essential questions and teaching strategies to emphasise transdisciplinary learning and transferable skills, deemed as critical for lifelong learning in a knowledge age. Many schools, including Korowa, have begun auditing content and pedagogy to embrace these new ideas about teaching and learning.

This article explores how ICT can be harnessed to deliver these changes and provide new directions for teaching and learning. It also evaluates some of the activities and projects that have been conducted at Korowa. In particular it will address strategies of using learning technologies that appear to have a favourable outcome for the education of girls.

Korowa is a high end user of technology for promoting learning. Our philosophy emphasises the need for technology to be used not just for its own sake but also as a way of extending and promoting valuable learning. From K to 5 our school operates with a desk top model; a compulsory notebook program runs from Years 6 to 10; a choice of notebook or desktop is provided for senior girls (Years 11 and 12) supported by secure remote access to the school Intranet.

In promoting the use of learning technologies, several characteristics should be discussed.

Customisation of learning

With the assistance of a notebook computer essential skills and tools of learning are acquired almost seamlessly with generic software. A process of inquiry can be commenced by viewing digital images with embedded sound files providing rich and provoking stimulus. Key questions can be generated, organised and refined using graphical organiser software like Inspiration. Using a hot list, students can open an Internet browser to access information which is processed using an online checklist or template designed to provide scaffolding for the task.

Email and/or shared network drives allow for sharing of information and collaboration with others, while Web Quests that might assign different roles allow students to develop new perspectives on the topic under investigation.

Skills can be practised and assessed using online quizzes to deliver instant individual feedback. Reflection on the learning process with the use of online surveys or digital portfolios allows the process of learning to be captured and shared with others.

My computer provides my own space for learning

With their own computers, girls can create their own learning space. A notebook computer is a construction site allowing girls to organise, store, retrieve and modify their work while accessing, sorting and classifying information before publishing, in a variety of contexts.

Unlike a work book, the power to control their learning space creates renewed focus and engagement. Surveys conducted with our Year 7 girls reveal this capacity to 'own' the learning space in their computers generates interest and engagement.

Creativity and self esteem

Linked to the notion of personal space is self expression. Girls comment on the pride they have in their work that has been enhanced through the use of colour or graphics. To edit work easily and correct minor mistakes allows for higher quality finished products that generate higher levels of self confidence.

A paper based paradigm has generally resulted in a linear work pattern. While certainly there are occasions when this is appropriate, using a notebook computer allows students to be creative in the way they attempt tasks. Indeed, because it is easy to store and retrieve work students become more self directed in the way they tackle tasks set for completion.

Different rates of learning

With increasing emphasis on differentiation of the curriculum we have found at Korowa that e-learning creates the capacity to differentiate. When units of work are published online, students more easily make choices about which task matches their level of interest and work much more at their own pace. By creating online tasks that are open ended in nature we have found that skill development comes just-in-time and breaks down the more traditional lock-step approach to curriculum design.

Moving from instruction to facilitation and individual support

As increasingly the Intranet is used to deliver curriculum bundles, or packages, the dynamic of teachers giving instructions begins to alter. More and more students commence activities without requiring instructions and formal class settings. For example in Year 10 Business Studies, a unit on budgeting and personal finance was self-taught, with girls accessing online templates and instructions in order to complete activities. This allowed teacher interaction to be more about coaching and facilitating individual learning.

Problem solving and decision making

The interface with learning technologies creates a whole new set of thinking required to operate in a digital environment. Editing of all types of material, collating, sorting, publishing and retrieving data are all completed in a more immersed environment when operating with a computer.

A notebook computer is a construction site allowing girls to organise, store, retrieve and modify their work while accessing, sorting and classifying information before publishing, in a variety of contexts.

The main approaches that yield results

1. Authentic tasks

Constructivist learning through doing and by building authentic tasks has blossomed. In Year 7 Maths at the end of a unit on number operations girls build their own puzzles in Excel to try out on their classmates. This learning through a real task has proved to be beneficial in consolidating learning as well as in generating greater enthusiasm for and engagement with the topic.

In the Year 7 and 8 Religious Education program student reflection and learning was developed through authentic tasks. The Exodus Radio Show involved students taking an ancient story and meshing it with the modern medium of radio and music. The key resurrection theme of death and new life took on a real message when girls created their own music CD covers.

2. Online curriculum packages

Our middle school (Years 6 to 8) participate in vertical projects that cross over the three year levels. Learning technologies play a significant role in delivering this project. The Woman of the World project completed in 2003 saw girls receive their activities online, collaborate online regarding problem solving required for the task and ultimately publish finished projects through an online medium, capable of being shared in the wider school community.

In 2005 a Year 7 travel project incorporating an international perspective included multi-media skill development as girls made stamps and sent fictional postcards from around the world. The process of learning was captured throughout using online surveys that were completed by every girl at the conclusion of each day's activities.

3. Multi-media – the new literacy

Enterprising Multimedia was a new unit introduced in 2004. In producing a lifestyle magazine, girls were introduced to the skills involved in capturing, editing and transforming image. They learned about basic video editing and used MS Publisher to produce magazine layouts.

During 2005, Year 6 and 7 students will explore the use of three-dimensional animation software that allows them to express their ideas differently, as well as challenge their understanding of cause and effect, perspective and storytelling, as they create fully animated worlds.

The feedback from girls has been most positive about the use of learning technologies. They are comfortable with computers and other devices and see them as part of their world. Providing one-to-one computing for all girls has addressed the important issue of access for girls and has certainly empowered them to become successful citizens of a knowledge age.

In our attempts to embed learning technologies into our classrooms we are reminded that we have not necessarily replaced the things we taught years ago, but rather computers and technologies have changed the way we teach and learn. Technology has the power to transform our learning environment. We attempt to harness that power to develop independent, lifelong learners.

Learning at the Speed of Fun

by SR Kessell, Penrhos College, Perth, WA

Penrhos College is a Uniting Church day and boarding school for girls, Kindergarten to Year 12, located in Perth, Western Australia. The aim of the College is to educate girls for life. An academic school, Penrhos is also a place where girls are taught to value spirituality, hard work, friendship, compassion, integrity, good humour, self-discipline, loyalty and community service.

In 1996 the Information and Communication Technology Committee of Penrhos College recommended that:

- the College increase student access to, and use of, computers within the context of the curriculum
- the College increase the number of computers in the College, and
- in future years, students provide computer hardware for their own use and that the College provide network infrastructure, technical support, peripheral equipment and software for this hardware.

These recommendations led to the implementation of the Penrhos College notebook program, in which all staff and all students (Years 5 to 9) use notebook computers and associated technology for teaching and learning. This program supports the development of student-centred, constructivist learning environments by giving students greater autonomy in their learning.

Cognitive Flexibility Theory

It became clear that successful integration of laptop technology across and within Learning Areas required that specific skills be taught to staff and students, and that support be provided for staff and students to ensure the correct use of the College network. The Learning Technologies Department, formed to integrate these requirements, is responsible for providing student and staff development in technology and its application to teaching and learning.

All Middle School students are enrolled in a Technology Skills program that addresses the Technology and Enterprise outcomes, specifically the T*echnology Process and Technology Skills* (Themby and Jeffrey, 2005).

This program provides students with the technical and organisational skills necessary to effectively use their laptop in all Learning Areas. The program is based on the Cognitive Flexibility Theory described by Spiro et al (1992, in Swindler 2001). This theory describes the human ability to restructure knowledge as an adaptation to changing environments. Cognitive flexibility enhances the attainment of knowledge in learning environments that require the integration of cognitive processes from different perspectives.

Skills are initially presented through electronic or teacher-led tutorials, during which students work in small groups and/or independently on related tasks. The acquisition of skills by students is identified by a range of assessment items that integrate with their learning in other curriculum areas. Rubrics that detail how students demonstrate a particular level are provided to them. The nature of the tasks is open-ended, allowing students to achieve a level higher than the focus of the assignment.

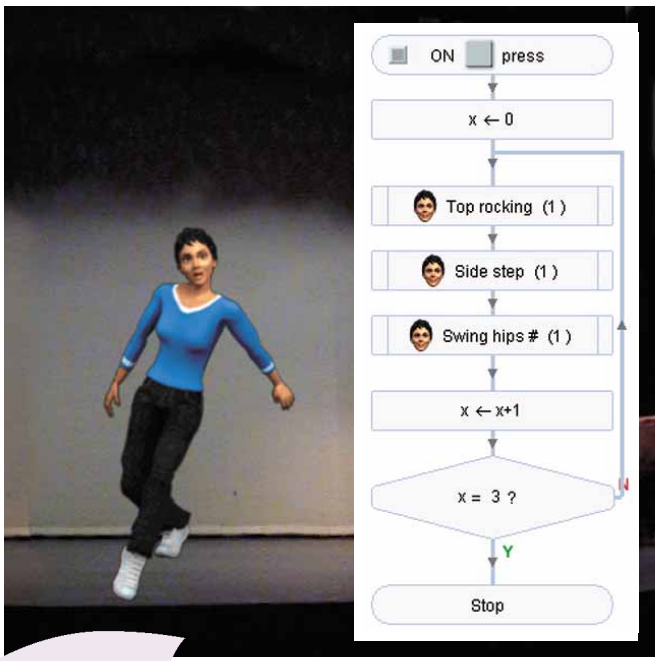


Figure 1. Programing dance routines with Crocodile ICT

Rather than trying to find gender neutral activities, or provide choices for the different sexes that will still provide valid and reliable assessment, we can focus on 'girl friendly' tasks.

As the College is an all-girls' school, designing a gender sensitive curriculum is probably easier than in a co-educational school. Rather than trying to find gender neutral activities, or provide choices for the different sexes that will still provide valid and reliable assessment, we can focus on 'girl friendly' tasks. The following paragraphs outline how we are approaching the teaching/learning of computer skills in 2005.

Computer programing

The package Crocodile ICT allows students to learn the basics of algorithm design and computer programing without having to learn programing language syntax. As they express their algorithm on-screen as a flowchart, the programing code is automatically developed. A significant aspect of this package is that it lets the user write programs to make 3D characters dance.

Thus the programing structures of sequence, selection and iteration can be understood within a familiar context.

In addition to teaching programing skills, this package will also choreograph live performances in Physical Education classes. A short dance routine is demonstrated in *Figure 1*.

Computer graphics

Students bring in advertisements from their favourite magazines. Factors such as page layout, intended audience and choice of colours are discussed. Technical aspects, such as the layering of objects, are analysed and practised.

Figure 2 shows an example of a Year 9 English assignment. The class had been studying movie genre. Their task was to design and produce the advertising materials for a specific film title.

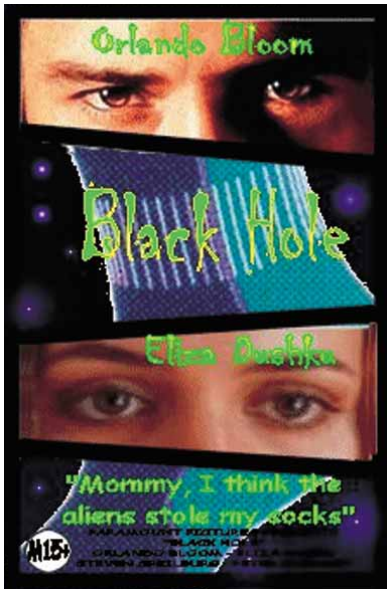


Figure 2. Student-designed poster

Social and ethical considerations

> ***You meet a guy on a chat line and you've been chatting for a while. He wants to meet you face to face. What should you do?***

Scenarios such as those in the box are given to students for small group discussion. The scenarios are based on real-life events relevant to the students' age groups. Typically there is a variety of responses, some based on their actual experiences. Other topics include emailing friends during class-time, SMS "gossip" and copying music from the Internet.

Video and sound editing

Having watched my own daughters grow, it is quite clear to me that girls love to perform! Digital video recording and editing has been used in a number of Learning Areas including Outdoor Education, Drama, Physical Education, LOTE, and English – areas that are not usually associated with technology. Tasks include music video clip production, designing and creating trailers for movies and the production of a Society and Environment breakfast show.

Word processing

While we do not believe it is our role to churn out secretaries and/or receptionists, word-processing skills are vital. Rather than focus on touch-typing tutorials we focus on features that will allow students to efficiently use a word-processor, for example, using the style function in MS Word to produce an interactive recipe book. Complete with hyperlinked contents and embedded sound/video of the girls cooking, the result of this project can be a great Christmas present, especially when burned to CD and decorated with a personalised label. Recipe books seem to appeal to our students at the moment as do interactive picture books and "choose you own adventure" creative short stories, in which the reader controls how the story develops by clicking on different hyperlinks.

Reading

This year the Year 12 Ball occurred soon after Valentine's Day. With the flavour of romance in the air, a database is being developed along the lines of a "Love at first byte" dating program. The difference being that the students are paired up for a blind date with a library book, based on the personal details they submit.

Conclusions

Recently a survey of our teaching staff indicated that 50% of our Middle School students had technology skills that far exceeded their expectations. A hundred per cent were, at least, satisfactory. Similarly, 73% of staff indicated that Middle School students demonstrated high levels of cooperation and collaboration when using technology in the classroom.

All of the ideas described above, with the exception of the programing software, use software readily available on most computer platforms. Visit http://m-ms.com and have your students design a spreadsheet to become involved in a global M&Ms chocolate count. Go to www.transl8it.com and rewrite Haiku poetry (and then write a short story using emoticons). The key seems to be to tune-in to the girls' current interests and build these into the teaching/learning program.

The key seems to be to tune-in to the girls' current interests and build these into the teaching/learning program.

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IT Adventure: Girls' Global Roaming

By Margaret McLeod and Elizabeth Hall, Wellington Girls' College, NZ

What if Christopher Columbus had had GPRS roaming attached to his email?

Last September, a language and cultural trip by Wellington Girls' College to Germany became even more exciting when Vodafone New Zealand loaned the group two GPRS data roaming cards set up in two laptops. The 21 students, three teachers and children of two teachers, were able to create and maintain contact with home while travelling throughout Germany.

The teachers and the students used the two lightweight laptops and the Vodafone GPRS data roaming cards everyday to reflect on events, activities, feelings and impressions as the group acquired new language skills and new understandings of the country they were exploring.

The overwhelming response from teachers, students and parents, both in New Zealand and away in Germany, was that trouble-free connectivity decreased stress for those wanting to communicate with home and for those waiting anxiously to hear from the travellers.

Moreover, the opportunity to produce on CD this digital extension of the travel diary has provided us all with a lifelong memory of a once-in-a-lifetime experience.

Year 13 student Elizabeth Hall explains the value of the travel diary:

The computer access in Germany was simply amazing. As students, it allowed us to keep in contact with our families and friends in two ways. The first was the more conventional way in which we were able to directly email home. The advantages this has over telephoning are:

- the time difference is not an issue
- the ability to send digital pictures and links shows where you have been, and
- it is easy to send a group email to a number of people.

However, it was the website which the school was creating that was the real success of the project. Every day, students would write a short entry describing the day's events, our accommodation, or just the general feeling we were experiencing. The teachers and students with digital cameras then supplemented these entries, and the new day's entry was put up. At the time we students didn't have the occasion or will to look over previous entries, but our families did. In fact, my parents checked the website on a daily basis to keep in touch with the progress of our trip, which then put into context what I was personally telling them. My friends and my German class back in New Zealand also regularly looked to see what had happened.

Perhaps the true testament to the success of the dairy occurred in Berlin where I met the parents of a German exchange student staying with us in New Zealand. One of the first things they told me was how they had been checking our travels on the website, and how amazed they were with it. They were blown away that we had the capability and means to create an on-line diary of our travel from literally the other side of the world, and although German themselves, they had found the entries fascinating and informative.

The advantages of the computer access did not stop when we returned to New Zealand. Travel diaries are a fantastic way to share your experience with friends and families. Overseas most of us wrote personal travel diaries, however once I got home I felt reluctant to show my personal entries to certain people. Because of the website I now have somewhere to direct people when they want to see first hand where we were. It is also really refreshing for me because I got on really well with the other girls on tour, and when I read their entries, I can almost hear their words, and I'm sure our families felt the same way.

Digital Girls: Creative Excellence in ICT

By Raewyn Baldwin, Wellington Girls' College, NZ

The concept even 10 years ago that we would all spend a significant amount of time each day interacting with a machine seemed "overhyped" and absurd. A computer experience was not as valuable as 'real' experience or interaction with other human beings.

While at an interpersonal level this may be true, in fact, the dramatic changes in our society have been "under-hyped".

Wellington Girls' College, a state secondary school, has undergone an ICT renaissance since 2002, recognising students need to be multi dimensional accessing the joint creative power of their brains and the processing power of the computer.

This combination of computers and human creativity can solve complex world issues. It is our technologically savvy, multi dimensionally talented students, who are the best hope for our joint futures.

The tools of our renaissance the tools have been simple ones: careful planning, the use of experts (often our students), commitment, the best possible ideas, and not being ground down by those who want to keep treading old pathways.

The most effective personnel in the change process have been our students. Their mandate to work within and run the new environment effected a change in school climate and the learning culture. Students as change agents have made staff training affordable for the school, ensured open access to equipment for the students and invested in growing the leadership power of our young women.

But it is not the equipment we are referring to when we describe our Renaissance. It is student capability. Since 2002, our girls have been at the top of the game. They have been in the finals of every New Zealand ICT competition including web design and movie making. Often they have been winners or placegetters. Now they are moving onto the international arena.

Tech Angels

In January 2005 two multi talented Year 11 students won 2000 pounds sterling and a week in Jamaica at the Childnet Academy in a worldwide web competition. Check the winners work out at http://www.childnetacademy.org/

Since 2002 these girls have had intensive training in "Tech Angel" courses including 3D animation (like *Shrek*), programing in Flash (action scripting), Dreamweaver (web design) Photoshop (image manipulation), Indesign (layout), Premiere (non-linear video editing).

Then there were six in our inaugural Tech Angel program; now there are over 60 girls enrolled in the co-curricular courses provided by the Ministry of Education Secondary Tertiary Alignment Resource.

Given the intense academic rigour of the Tech Angel training, it is not for the faint hearted. The girls commit 21 to 40 days of out of school time to train. They leave with the best skills in software and hardware use that we can provide.

Tech Angels are leaders of staff and students. As a result, we have experienced renewed understanding in several dimensions, which are changing our contexts for learning:

1. How our students learn. Digital Technologies enable students to become authors and creators who take charge of their own learning.

2. What our students learn. The Digital environment enables complex concepts, previously thought to be beyond the understanding of 13–17 year olds, to be accessible to younger minds.

3. Who our students learn with. "Connectedness" and "citizenship" are keywords. You can learn with NASA scientists, a mentor in a particular discipline or with a peer in a distant country. There are no boundaries other than those in our teaching heads.

Wellington Girls' College has taken its role as a lead school seriously, providing leadership for staff and students and welcoming other schools who are keen to make changes to the relationships between teachers and students.

The key has been to model the changing dynamic between teachers and students. Tech Angels have provided a transformational tool by which to view other interactions in the college. We have questioned how people learn best and discovered that the relationships, the trust and the empathy of staff and students has been enhanced. When we provide students with real and meaningful opportunities to engage with staff, the equality and sharing has enriched us all.

Information and communication technologies still do "admin" and yes, we still have teachers struggling with Word and Excel and administrative software. They probably don't text either!

But we use ICT in a contextural environment, sometimes integrated with traditional learning practice. It is both the tool and environment. Learning to use software, experimenting, debugging, reviewing, peer reviewing, thinking and rethinking, the process of thinking, creating and presenting, are not just tools from the English curriculum. Information and Communication technologies provide brilliant strategies for problem solving for life. Our students say, "Nothing will stop us now!!!!"

Wellington Girls' College is willing to lead and take risks in doing what we believe will make the most difference to our students. We see the potential and are willing to encounter the problems to change how our learning happens.

Take risks to do the right thing for your students.

Ruyton Research: Ethics, Science and Society

By Cathryn Furey and Donna Cohen PhD, Ruyton Girls' School, Kew, Victoria

Associate Professor Donna Cohen, Faculty of Medicine, Nursing and Health Sciences at Monash University served as Executive Officer, Human Research Ethics Committee of the Victorian Department of Human Services.

Donna, a graduate of the University of Sydney, the ANU and Monash University, has a Ph.D in Biochemistry and Molecular Biology. She has worked in research institutes in the US and Australia and has co-authored numerous scientific papers and book chapters. Her passion for helping the general public understand science led her to establish a drama company offering performances about science.

Cathryn Furey, Dean of Science at Ruyton Girls' School, Kew, Victoria, since 1998, teaches Physics and General Science.

Creating a Scientific and Ethical Society

As scientists continue to explore new frontiers, it is critical that society can make informed, ethical decisions about the pathway for the future. Members of society need to have an understanding of ethics if they are to be responsible.

Often our understanding of complex issues is significantly influenced by media or politics, two areas where ethical considerations are not always the primary concern. Much of the responsibility for laying the foundations of a scientifically literate and ethical society lies with the school Science Department, as this is one of the few places where young adults are given the opportunity to learn about science and its implications.

Educators are becoming more conscious of the need to cater for a range of learning styles in order to deliver a curriculum that will provide rich, appropriate and enjoyable learning opportunities for all students.

Drama as an Effective Teaching Tool in Science

Educators are becoming more conscious of the need to cater for a range of learning styles in order to deliver a curriculum that will provide rich, appropriate and enjoyable learning opportunities for all students. At Ruyton Girls' School, role plays are utilised in many of units of work, a practice that has been extremely useful for all students, but in particular, for the kinaesthetic learners who use movement and activity to help them learn.

As a result, Ruyton has participated in the STAV Science Drama Competition on a number of occasions. Incursion programs have also allowed science theatre presentations such as those offered by Dr Donna Cohen to be integrated into the science curriculum.

Following one of these performances in 2002, the idea of using drama to enable students to grapple with some of the ethical issues that confront scientists and society was discussed. This area of the curriculum had previously been covered informally through class discussion, but students needed to develop a more rigorous grasp of ethics and the impact of ethical considerations on the practice of science.

In 2003 Year 10 Science students participated in an Ethics, Science and Society project with Dr Cohen as Program Facilitator.

The Program

The Ethics, Science and Society program involved three stages: introduction; script preparation and rehearsal; final performance.

In the introduction stage, the Facilitator launched the program, giving the students a brief overview of the concept of ethics and some of the major ethical theories, illustrated by current social issues. This launch initiated discussion as the Facilitator posed ethical dilemmas from science and everyday experience and encouraged the students to consider what their ethical viewpoint was and why they held these beliefs. For example, they were challenged to identify actions that could be considered absolutely (ie, in all circumstances) right or wrong, good or bad, and to consider cultural differences in the perception of right and wrong.

Each class was then allocated a scenario related to an ethical scientific dilemma to explore. In the first year of the program (2003), the three topics were:

- The release of genetically modified crops
- The use of human tissue samples in research without consent
- Xenotransplantation (transplanting animal organs into humans)

In 2004, a fourth topic was added:

- Genetic selection to produce a sibling who can be a tissue donor for a sick child.

The topics were selected by the Facilitator from a number of sources, including current political issues (GM crops), anonymously presented cases actually considered by Human Research Ethics Committees (human tissue samples in research) and foreseeable issues arising from current research directions (xenotransplantation). For each topic, hard copy and on-line resources provided students with a starting point for their research into the scientific and social aspects of their issue.

Students were given a number of lessons (in 2003, it was 5 x 50 minute lessons across a 6-week period; in 2004 it was 8 x 50 minute lessons in a 3-week period) to develop a drama

performance that explored their issue from a number of different perspectives. It was stressed that the aim was not to solve the problem, but to consider the different interest groups who might be affected. In order to do this, once the class had agreed on a general story line/theme for their performance, they broke into five smaller groups, with each of the groups taking on a different perspective and undertaking research so that they could support their viewpoint with valid scientific or social argument. The class came together again in the final lessons to blend their four minute performances.

While researching and script writing, students had access to all the usual resources, but also emailed the Facilitator on a regular basis for feedback regarding their scientific accuracy, script development and ideas. This process was vital for the students who responded extremely well to feedback from an expert other than their classroom teacher.

During this stage of the project, students were required to maintain an individual logbook. The last five minutes of each lesson were set aside for logbook writing when students reflected on the group's progress and, most importantly, set goals for the next lesson, an effective means of focussing students on the task and enabling them to use their time efficiently.

Humour, satire and drama were all used by the students to convey their messages and it was very clear that many of them had developed a far better understanding of their issue and the ethical dilemmas faced.

In addition, each group compiled a folio of resources, email transcripts and stages of script development. These two assessment tasks aided the students in their organisation and planning of their performance, kept them on task and encouraged reflection and goal setting.

The students were encouraged to learn their lines and use props and costumes in their performance, and were assessed on the effective use of voice, how well the performance linked to the class theme, scientific content and audience engagement.

Final versions of the scripts were provided for the Facilitator, so that potential issues for discussion could be identified in advance of the performance stage of the project. The whole year level attended the final performance and discussed each class's presentation. Chaired by the Facilitator, the discussion following each presentation focussed on the issues raised during the performance.

Outcomes and Reflections

The Ethics, Science and Society program was run for the first time in Term 2 2003 and, although it was not formally evaluated at the time, there was sufficient informal positive feedback to support repeating the program. A number of revisions were incorporated into the 2004 version, including conduct of the script preparation and rehearsal stage in a more concentrated timeframe, formalised student assessment and mechanisms for student feedback and evaluation. In 2004 the program was run in Term 4, providing a challenging and thought-provoking conclusion to the four-year core science program.

On performance day, the buzz in the theatre at the beginning of the presentation suggested that students had enjoyed the process and were excited about their performances. The quality was outstanding - even the few students who were disengaged from science and had already made the decision not to continue with VCE Science were obviously challenged and involved, and often took on leading roles in the performances. Humour, satire and drama were all used by the students to convey their messages and it was very clear that many of them had developed a far better understanding of their issue and the ethical dilemmas faced. A strong indicator of the amount of interest was when the final presentation ran into lunch time and the students remained engaged in the discussion.

The students were surveyed about the program three weeks after the final performance. Of the 60 responses received:

- 95% indicated their understanding of ethics improved as a result of the Ethics, Science and Society project
- Nearly 45% believed they gained a much better understanding
- 94% of respondents thought the use of drama was an effective way to learn about ethics
- 44% thought drama to be a very effective teaching tool for ethics.
- 97% of students found the project enjoyable, with students commenting favourably on the informality of the activity and that using drama made the subject easier to understand.
- Nearly one quarter said the component they enjoyed most was watching each other's performances, suggesting that the project was successful both from a participant and an observer standpoint.

The scenarios the students enjoyed most were those based on real, current issues which they identified as being most relevant to themselves, where the ethical "solution" was not obvious. Considerations for future topics include nuclear proliferation and environmental issues.

Ruyton intends to include the Ethics, Science and Society program as part of the core science curriculum for Year 10 students. Qualitative and anecdotal comparison of the experiences in 2003 and 2004 indicates that running the program as a focussed three-week project at the end of the year produces the best learning outcomes for the students. Furthermore, although the program can be conducted by science staff within the School, using the Facilitator provides extra engagement and learning because of the wealth of experience and different approaches the Facilitator provides.

The Ethics, Science and Society program enables students to enter VCE Sciences and society with a greater understanding of the relevance of science to their lives, and an appreciation of the issues and challenges that can arise in undertaking research and applying scientific advances.

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