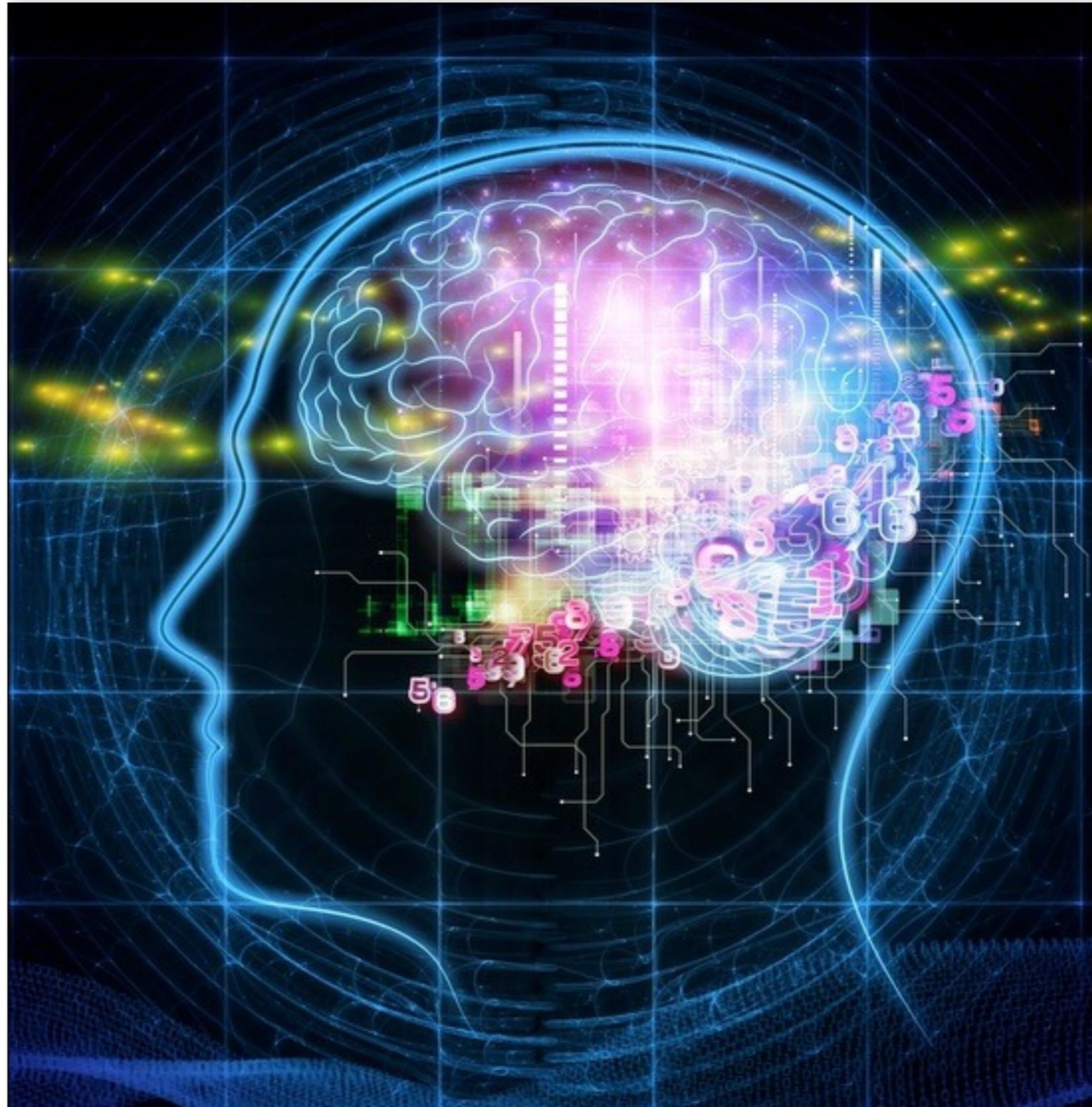


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Educational Computing
JOURNAL OF THE AUSTRALIAN COUNCIL FOR COMPUTERS IN EDUCATION

VOL 28 NO 1



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Editorial

Dr Jason Zagami

Australian Educational Computing

Welcome to the new look Australian Educational Computing (ACE).

Building upon investments in the Digital Education Revolution, integration of the ICT General Capabilities of the Australian Curriculum, and the imminent introduction of Australia's first F-12 Digital Technologies curriculum, there is again a confluence of significant activities occurring in computer education. The resulting interest by all educators and decision makers in computer education provides fertile ground in which to share initiatives with colleagues, report research, and influence changes in curriculum and pedagogy.

While your social media channels and PLN facilitate water cooler discussions, Australian Educational Computing provides opportunities for deeper reflection and exploration. Combined with our ACEC bi-annual conferences and local association activities, AEC contributes to a multi-layered professional learning environment to

serve your personal educational needs. Relying upon just one format necessarily leaves gaps and weaknesses but by layering your learning in depth, formats can support and enhance each another to build a learning environments that is more effective than the sum of its parts.

AEC has two key audiences. First the journal serves a scholarly purpose, sharing the research of educators and academics who submit articles to be peer reviewed and published in an online repository that is indexed and searchable. This is now being accomplished through an Open Journal System to which articles can be submitted, reviews allocated and completed, and if accepted by the peer review process, articles are published and made immediately available. You can also subscribe to RSS feeds and email alerts to receive notification when the latest research becomes available.



The Open Journal System (OJS) is useful for those searching for particular papers on specific topics as it integrates well into search/indexing services, but is often not as readable in comparison with printed journals. This brings us to our other key audience, professional educators who wish to share their initiatives and keep abreast of the latest research but whose writings is not of a nature that needs the peer review process. These can also be submitted via the OJS website and while still subject to editorial approval, the editor will work with authors if necessary to bring articles to a standard for publication.

Twice a year in July and November we publish general articles, research papers, and association news, into journal editions that are readable on digital devices and printable. Currently we will be publishing in iBook and PDF (Landscape) formats and these are available from our ACCE website at <http://acce.edu.au>.

If you have research to publish via the OJS, visit <http://ojs.acce.cc.com.au> and create an account. You can then submit Refereed/Reviewed papers, and track progress through the review, editing and publication process. Accepted articles will then be immediately available on the OJS database.

If you wish to submit a general article on teaching practice or other area of interest to computer education professionals, you can also visit <http://ojs.acce.cc.com.au> and create an account. Then you can submit Non Refereed/Reviewed papers that will be considered for publication in the next journal edition in July or November. As the editorial process can take some time, please try and submit articles as soon as possible otherwise they may not be published until the following edition.

In addition to general articles and research publications, each edition will summarise the activities of your local professional association over the last six months and their plans for the next, and a national overview from our ACCE president. Collectively, these three genres should assist you in staying up to date with what is occurring in educational computing regardless of your particular focus, and provide you with a means of sharing your contributions with peers.

In this edition we have reports from several ACCE associations, providing a general overview of computer education professional association activities across Australia. General articles reflect upon the ISTE Study Tour of Australia, including their visit to ACEC2012, a snapshot of one schools approach to engaging students with digital technologies, and how the ACCELN online video conferencing panel discussion has been setup and run. Research studies in this edition include an analysis of online discussions, the views of secondary teachers to using educational technologies, the use of the TPACK framework to analyse learning objects, and the use of Facebook to enhance student online discussions. These are also available on the OJS at <http://ojs.acce.cc.com.au/index.php/AEC/issue/view/2> and I encourage everyone to create an account on the OJS to receive the latest research papers as they become available.

Please enjoy the latest AEC and consider your contribution to our next edition,

Dr Jason Zagami
Editor

Australian Educational Computing

Australian Educational Computing (AEC) is the refereed journal of the Australian Council for Computers in Education (ACCE) and is published twice a year.

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Advice to Contributors

The editorial board welcomes contributions in the form of original articles, letters, reports and reviews. AEC provides a vehicle for the publication of articles for which a national or international audience is appropriate. These fall into a number of categories. There are articles relating to research in the educational computing field and which are likely to be of interest to a wide cross-section of educators.

In addition there are many educators who are exploring new ideas about the use of computers in education and who are writing articles of national interest. The journal may also contain reprinted articles from international organisations such as ISTE and IFIP; however the majority of articles are of Australian content.

- Refereed/Reviewed papers can be articles relating to research, theoretical articles, position or policy papers.
- Non Refereed/Reviewed papers can be papers relating to practice or policy.
- Authors should ensure that their manuscript conforms to the American Psychological Association (APA6) bibliographic convention.
- Generally authors should aim for articles of 4000 words.
- Articles should include an abstract of 100-150 words.
- Articles should generally be submitted in the Microsoft Word or Apple Pages file formats.

- Authors should include a brief autobiographical statement on the submission form and upload as a file attachment (to their bio submission) a current photograph (ideally 1024 pixels in JPEG or PNG formats).
- Authors should include a reference list in APA format on the submission form with each reference separated by a blank line.
- Authors may also submit additional material such as research data or multimedia.
- Papers contributed for the Refereed/Reviewed sections will be anonymously refereed by at least two members of the Editorial Board. All submitted material will pass through an editorial phase to maintain journal standards and balanced coverage.
- To ensure the integrity of the blind peer-review for submission to AEC, every effort should be made to prevent the identities of the authors and reviewers from being known to each other. This involves authors, editors, and reviewers (who upload documents as part of their review) checking to see if the following steps have been taken with regard to the text and the file properties:
 1. Authors have deleted their names from the text, with "Author" and year used in references instead of the authors' name, article title, etc.; and
 2. Metadata in document files that shows the author of the document has been removed.

Disclaimers

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30th of June for the Winter Edition

31st of October for the Summer Edition

Publication Dates

Refereed/Reviewed articles will be published immediately upon successful review to <http://ojs.acce.cc.com.au>

Compiled editions containing research articles, general articles and association reports will be published to <http://acce.edu.au/journal> twice a year in:

July for the Winter Edition

November for the Summer Edition

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Associations



ACCE

Tony Brandenburg

Australian Council for
Computers in Education

ACEC2013 Conference



Let me begin by recognising a new and vibrant approach to the Australian Council for Computers in Education (ACCE) journal, with many thanks to Dr Jason Zagami for his insight and hard work.

Many times I have been asked, “What is the role of a National Professional Teachers’ Association?” and many times I have replied citing the three traditional cornerstones: representation for teachers, a national voice and a significant way for states and territories to exchange ideas and resources.

Our world though, the world of the professional teachers' association, has changed. The significant work of ACARA and AITSL has brought a national perspective to curriculum and teacher standards, the National Broadband Network (NBN), the downsizing of education department staff in many states, social media, gaming pedagogy, computational thinking and the big players (Google, Microsoft, Intel and Apple) participating even more in education and bringing a more philanthropic approach to how they participate, are all game changes for teacher associations.

ACCE is fortunate in that our biennial conferences are highly successful, the state and territory member associations are strong, vibrant and healthy and administered by passionate teachers who are trying to make a difference and that the corporate world has acknowledged our work with generous support, both financially and with in-kind donations. (Let me especially acknowledge Promethean, for its support and its commitment to further support for ACCE)

So this year my response to the above question has been more about how, by working with ACARA and AITSL on significant projects, we have been able to bring teacher voice, with a specialisation in ICT, to the discussion table. Both organisations have recognised our contribution and continue to involve us in their work. These national authorities are to be congratulated that they recognise the importance of teacher voice and teacher consultation. As we are fortunate that the foresight of previous ACCE leaders has created a national network and structure for teachers to be involved so their voice is heard by the decision makers.

I also answer the perennial question by explaining that it is important to work hand in hand with other associations (not necessarily from the same subject area) and philanthropic organisations. The days of teacher associations being in competition are well gone as there is just not enough support to allow competition in the education market place. I don't think we are far away from seeing subject associations combining to provide super conferences!

As always, my thanks to the ACCE Council members for all the volunteer work they do, my congratulations to them and their organisations in the states and territories on the significant impact they have had on national thinking, and I look forward to the continuing debate around Digital Technologies as a subject in the Australian Curriculum.

Tony Brandenburg
ACCE President

QSITE

Dr Margaret Lloyd

Queensland Society for
Information Technology in
Education



QSITE began 2013 with its Annual General Meeting where we celebrated our association's award winners for 2012. These are: Matthew Jorgensen - Educator of the Year; Brendon Thomas - Emerging Leader of the Year; and MJ Raatz - Outstanding Leader of the Year. We held our election for the 2013 State Executive and, as indicative of the distributed leadership of the association, we now have a President, Vice

President, Treasurer and Secretary in differing locations along the Queensland coast.

We also held an extended Chapter Meeting which brought together the Chairs of each of our chapters - Far North Queensland, Gold Coast, Townsville, Rockhampton, Toowoomba and Wide Bay. We are establishing "networks" at the Sunshine Coast similar to the Brisbane network.

Through these groups, we are able to provide targeted professional learning throughout the state.

QSITE has been recently engaged, as with other state and territory associations, with reviewing and responding to the Draft Australian Curriculum: Technologies, with a particular focus on the subject of Digital Technologies. The association's response to ACARA was developed through wide-ranging conversations including some online "town hall" sessions. We are excited by the challenges ahead in preparing for this curriculum as well as ensuring that ICT as a General Capability is effectively embedded in our classrooms.

Our attention is now directed to preparing for our annual state conference – please see <http://www.qsite.edu.au/2013> for details. The conference theme is Finding Your W@y – a theme which refers to helping educators and system leaders find their way in making decisions about infrastructure, the implementation of BYOD or 1:1 programs and, increasingly importantly, about curriculum, particularly with the advent of Digital Technologies. The conference will be held on Monday, September 30 and October 1 at Sienna College, Sippy Downs, Sunshine Coast.

As trialled in 2012, we will again be having mini-keynotes and have invited an interesting range of speakers, most of them outstanding local educators from across differing school sectors. This includes:

- Bruce Fuda, representing ACARA, and speaking on the current development of the Digital Technologies subject
- Peter Twining, from the Open University, UK who will speak on the content and impact of UK Computing curriculum

- Chris Gauthier, who will speak about his inspiring DeforestAction project which has received international acclaim.
- Paul Shaw, who will speak on his effective Kids Connect program.
- Jackie Guiney, an early years educator, will share her work with little people programming with BeeBots.
- Kris Kopelke, a primary educator, will share her work with a Game Squad and Digital Clubhouse.
- Liam Brown, a Year 12 student, who will share his experience with the DiSH, Department of Information Security Hub.

The two days of the conference will have quite different foci. Day One will be dedicated to Digital Technologies and all workshops and sessions will be concerned with this new F-10 subject. Day Two will look more like a “normal” conference but with a twist – we are setting up a special Parent Strand. This will include an ACMA presentation on cybersafety as well as a special student-led workshop on robotics.

The conference coincides with an ACCE Board meeting and QSITE is delighted to host the Board and to welcome its members to Queensland. We are looking forward to this event. The annual conference is a wonderful opportunity for QSITE members to renew friendships and professional connections.

I would like to acknowledge the professional generosity of those who contribute to QSITE - from those who write for and edit the journal, who organise professional learning for others, who present, and who initiate or join online conversations. Professional associations are all about celebrating the profession.

EdTechSA

Dr Trudy Sweeney

The Computers in Education Group of South Australia (CEGSA) is now EdTechSA, an active and vibrant professional association who welcomes new members.

Visit the conference website 2014.acce.cc.com.au to become part of this exciting learning community.

Visit www.cegsa.sa.edu.au or email Michelle Westphalen via office@cegsa.net.au



During the last six months, CEGSA has focused on 'business as usual' activities as well as two new major exciting developments related to our change of name and hosting of the national conference in 2014. We are also proud to have recently received the Innovative Association Award by the Council of Education Associations of South Australia in recognition of our contribution to the teaching profession.

The Management Committee has welcomed new members elected at the Annual General Meeting, reviewed our vision and future strategic

directions, and facilitated professional development activities focused on the Australian Curriculum, and the Australian Professional Standards for Teachers with international educational technology leader George Couros. We have also been busy preparing for the annual state conference to be held on 17-18 July, publishing exam revision guides for senior secondary IT teachers, and overseeing many exciting plans related to our association hosting the Australian Computers in Education Conference (ACEC2014) on 30 September to 3 October, 2014 at the Adelaide Convention Centre.

We are now EdTechSA

The first exciting major new development is that CEGSA has officially changed its name to become EdTechSA (pronounced Ed – Tech – es - ay). The name change reflects a desire to expand the limited emphasis on computers to a broader use of technologies in education. In addition, the change will assist educators to understand what our professional association is about, and how to pronounce our name. As a committee, we are now working towards the creation of our new logo and rebranding of our websites and social media communities with an official launch at the state conference.

EdTechSA is a professional association of educators and school leaders that promotes and supports teaching and learning with Information and Communication Technologies (ICT) across the curriculum and the study of Information Technology and Digital Technologies as subjects by:

- **Promoting networking, communication and sharing** within the educational community about research, quality practice, resources, and current issues and initiatives.
- **Providing high quality professional learning opportunities** for educators and school leaders to learn from international, national and local experts.
- **Acting as an advocate on behalf of South Australian educators** at national, state and local levels on educational issues related to ICT and IT.
- **Contributing to the work of Council of Educational Associations on South Australia (CEASA), Australian Council for**

Computers in Education (ACCE) and International Society for Technology in Education (ISTE)

- **Recognising and celebrating excellence** in the educational use of ICT in South Australia.
- **Facilitating partnerships** with industry and other professional associations to benefit educators and students.

ACEC2014 Update

The second exciting major new development that we have been busy planning is the launch of the national conference website and call for papers for ACEC2014.

The conference theme “Now It’s Personal” is about on you and your learning. ACEC2014 is an opportunity to connect, collaborate and co-construct new ideas as part of formal and informal learning conversations before, during and after the conference. You will be inspired to explore current trends in personalised learning and related pedagogical shifts.

The ACEC2014 website is now live and ready for you to explore. You are invited to:

- **Sign up to the [website](#)**, to personalise your learning experience and receive regular updates about topics which interest you.
- **Visit the [Call for Papers page](#)** to consider how you can share your learning with like-minded educators via a broad range of presentation options which include, refereed papers, non-refereed papers, presentations, workshops, panels (symposia), speed sharing, unconference and poster sessions.

ICTENSW

Steve Madsen

Information Communication
Technology Educators of New
South Wales



The ICT Educators of New South Wales (ICTENSW) is a professional organisation designed to support ICT educators in New South Wales.

ICTENSW represents all teachers' interests at local, state and national level. It advocates on matters of curriculum and equity, and promotes best practice in the use of ICT in learning.

ICTENSW provide resources, professional development and a network of collegial support.

ICTENSW organises four major professional development workshops a year. The first meeting takes place over a weekend in March to cater for regional educators while the other three meetings take place at a local Sydney high school from 4 - 9pm. Each meeting consists of various workshops that may be computer science focused, ICT integration focused and / or teacher pedagogies. Participants choose which workshop they will attend. The presenters are volunteers who gladly pass on their expertise. Each workshop is accredited using the National Teaching Standards.

ICTENSW is directly linked to three NSW Higher School Certificate courses: Software Design and Development, Information Processes and Technology, and Industrial Technology: Multimedia. ICTENSW creates the solutions for the 3 courses and make them available online for revision purposes to financial members.

Members of ICTENSW are intimately involved in all levels of the NSW Higher School Certificate Examination cycle.

ICTENSW receives requests to run workshops in regional NSW. "Strike teams" are sent out to the regions for a weekend's worth of activities for students and teachers providing the regions are able to arrange appropriate participant numbers.

ICTENSW sees that it will be very active in supporting ICT educators as the new Technologies Curriculum is introduced throughout Australia.

TASITE

Ken Price

Tasmanian Society for
Information Technology in
Education



TASITE activity has been influenced by the Australian Curriculum draft Technologies paper, and the consultation process around it. A submission to ACARA was made after several consultation processes. This submission reflected teacher views on aspects of the Digital Technologies subject. In particular there was support for the concepts that underpin Digital Technologies and also some concerns about the resourcing, professional learning and workload that would be required to implement them.

Our AGM speaker was former ACCE president Michelle Williams, who gave an excellent account of the work that she and partner Paul have undertaken in school communities to change school culture about ICT. As might be expected from Michelle's diverse range of experience, this was a thought-provoking session. Of particular interest was her experience with indigenous communities who were keen to use technology to improve their world. One comment stood out - an Aboriginal elder who was asked about the essential skills that he wanted his young indigenous people to learn in

school. His response included the predictable literacy, numeracy and financial skills, but also included project management, a skill that is often not visible in mainstream schooling. Several participants found this challenged the content of our conventional curriculum provision.

TASITE has also provided access to some professional learning, including TeachMeet-format events related to use of iPads in schools, sessions on the use of Scratch, and in conjunction with another professional association a demonstration of 3D Printing and the opportunities that they present.

Several TASITE executive were involved in planning a statewide Professional Learning day for all Technology teachers, including Digital Technologies. This day was aimed at preparing for Australian Curriculum Technologies implementation, and included looking specifically at computational thinking and programming. Resources for the PL day have been included in a Scootle Community network for use by other teachers, and to help sustain activity beyond the actual PL event.

We are also running and supporting regional sessions on the use of the Raspberry Pi computer, a very cheap computer the size of a credit card which has been developed to help promote programming. It runs a Linux variant operating system and is a good platform for Python (the default programming language on these devices). We are hoping that schools will see these as a cheap way to have students undertake some rewarding and fun projects with serious engagement.

We are looking forward to supporting teachers in their ongoing work with students to help use ICT in building a better future.



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INTEACT

Cathy Crook

Information Technology
Educators Australian Capital
Territory



A small, but enthusiastic and experienced, group of ACT educators has re-ignited a local professional body focused on Computer Science and integrated ICT. Significant milestones in this journey were –

- Incorporation of the new entity, Information Technology Educators ACT (InTEACT), from 14 November 2012.
- Development of a vision – to be the expert professional association providing leadership in, and support for, educators of Computer Science and integrated ICT in the ACT community.
- Holding the inaugural AGM on 18 March 2013, at which the Committee of Management was elected and life memberships conferred.

InTEACT members are from all education sectors (early childhood, primary, secondary and tertiary) and from government, catholic and independent settings in the ACT and local NSW surroundings. With the infrastructure of InTEACT now established, using Google Apps as

the key communication tool, attention has turned to professional learning opportunities, consultative input to national education agendas and extending the association's reach in terms of its membership and influential advocacy.

InTEACT is enacting its vision through –

- Strategically building and nurturing a professional learning community focused on use, and benefit, of information technology in education;
- Promoting pedagogical change by supporting computing projects that inspire both innovative and transformational shared practice;
- Developing a resources repository, including contemporary research, to foster engagement of members in quality information technology application;
- Creating and maintaining links with relevant associations, educational partners and industry bodies for mutual benefit;

- Adopting an advocacy role with key stakeholders to promote effective access to, and use of, information technology; and
- Modelling contemporary ICT tools and strategies in how the association interacts with members and a wider audience.

The Australian Curriculum: Technologies (Digital Technologies) paper was the discussion topic at the AGM. Perspectives and insights from this forum, and a subsequent session, underpinned InTEACT's formal consultative response to ACARA. As follow-up, InTEACT is hosting workshops, on 26 and 27 August, to address in a practical context the content and skills base outlined in the Australian Curriculum: Technologies (Digital Technologies). There will be separate strands for primary and secondary sector teachers, to best meet their needs and respond effectively to their emerging queries about the national curriculum and its translation to classroom practice. There will be an emphasis for primary staff in building connections between Digital Technologies and other learning areas, on robotics and visual programming. In the secondary sphere, specific elements of the curriculum will be a focus, such as Open Data (programming activities using real world data) and Cryptographic Ciphers (exploring Computer Science in years 9 and 10).

In other strategies to engage teachers in sharing ICT successes, thoughts, activities and resources, InTEACT is adopting the TeachMeet concept successfully implemented by our NSW counterpart, ICTENSW. Additionally, local educators can apply for InTEACT funding to support, through specific resources or release time, the implementation of relevant classroom projects. To qualify for such funding, need to co-fund (but not necessarily to

the same level), commit to sharing resources developed and provide a brief report on project conclusion. A primary school, for example, has been granted \$1,500 to design, scope and implement the use of Google Apps for Education to publish student portfolios on-line as a conduit to showcasing student learning in a home environment.

InTEACT can be accessed at <http://www.inteact.act.edu.au>. Membership is \$30 per year for other than student members, for whom the rate is \$10. The current committee members are listed below.

- President – Bruce Fuda
- Vice President – Mitch Tummers
- Cathy Crook – Secretary
- Ian Ross – Treasurer
- General Members – Ben Ballard, Graham Cassells, Katie Ley, Hugh Miley, Matthew Pham, Alex Richardson

Australia's Campfires, Caves, and Watering Holes

Ann W. Davis and
Kim Kappler-Hewitt

Educators on ISTE's Australian Study Tour discovered how to create new learning and teaching environments where curriculum and instructional tools meet the digital age.



Students visit the “campfire” to hear a story at Northern Beaches School in Sydney. Visit vimeo.com/49879366 to take a video tour of the school and see how educators are creating learning spaces that personalise and differentiate instruction.

Educators recognise that they need to create new learning and teaching environments where the curriculum and instructional tools reflect today's world. Our schools are full of students who want to engage, socialise, communicate, create, and collaborate in meaningful ways that reflect the world in which they live. How can education re-create itself to engage these learners and keep up with the pace of this change? What can educators do in response to change and to reach their digital students?

These questions led our group of 17 educators (university professors, directors of technology, classroom teachers, tech coordinators, library media specialists, corporate representatives, researchers, ISTE's president, and two board members) from the United States and Norway on a two week study tour to Australia to seek answers.

Transforming Learning Spaces

Australia has long been known for setting the pace in ed tech pedagogy and practices. To get a sample of what educators are doing in this country, the study group visited the Australian Council for Computers in Education conference (ACCE). While there, several of our group members presented and led sessions during the week. We also visited a variety of schools, libraries, professional development centers, and educational organisations in Perth, Melbourne, and Sydney. One concept that caught our attention was the construction of learning spaces to support personalised and differentiated instruction in several schools.

Futurist David Thornburg identifies three archetypal learning spaces — the campfire, cave, and watering hole—that schools can use as physical spaces and virtual spaces for student and adult learning (bit.ly/YvRuWC)

The campfire is a space where people gather to learn from an expert. In the days of yore, wise elders passed down insights through storytelling, and in doing so replicated culture for the next generation. In today's schools, the experts are not only teachers and guest speakers, but also students who are empowered to share their learning with peers and other teachers.

The watering hole is an informal space where peers can share information and discoveries, acting as both learner and teacher simultaneously. This shared space can serve as an incubator for ideas and can promote a sense of shared culture.

The cave is a private space where an individual can think, reflect, and transform learning from external knowledge to internal belief. Schools across Australia had both posters and places to encourage this private individual time.

Students visit the campfire to hear the story we want to tell through our instruction. They are able to share in this experience in person or via technology in a flipped classroom.

The watering hole used to be the walk home after school or the phone calls after dinner. Now students gather with peers online using Facebook, Edmodo, blog posts, or text messages. Their opportunities to share have multiplied astronomically and can benefit from the guidance provided by school-created platforms for discussion.

Increasingly, studies of the brain and learning indicate the need for metacognition, which takes time, practice, and a quiet space to reflect. The cave becomes not only inviting, but also essential. As students reflect on the meaning of their work, the content cements,

and a new cycle of goal setting and achievement begins, allowing students to engage, socialise, communicate, create, and collaborate in meaningful learning that reflects the world in which they live.

The cave is perhaps the most challenging venue for students as they are called upon to reflect by themselves. But technology can inspire students through the examples offered in student blogs. Private thoughts made public demonstrate that personal reflection is valued, every opinion matters, and knowledge rests at your fingertips within a search box.

At the Carey Baptist Grammar School Library in Melbourne, the librarian has been experimenting with her use of space. The school is on the cusp of constructing a new library media facility. It was here that we first came across the idea of cave, campfire, and watering hole. She explained that as she planned the school's new facility, they would use Thornburg's concepts. She noted that one of the ways she experiments with the cave concept is to take desks and chairs and place them in corners and crevices that are off the main floor of the library. Inevitably, she finds these spaces occupied and even coveted by students and teachers in search of quiet and reflection. These isolated study spots are excellent examples of cave zones.

The Northern Beaches Christian School provided us with compelling examples of spaces that could simultaneously accommodate learners in multiple phases of their learning quests. The classroom demonstrates how a campfire space to the rear conjoins with a comfortable watering hole space where students can easily move around and work next to each other in a social way. The students also created a cave-type environment by reconfiguring the removable furniture.

Personalising Instruction

What does this concept mean for teachers? How can it transform learning and teaching? This construct of learning spaces allows teachers to adapt the learning to meet the needs of students—to personalise instruction and allow students to explore different modes of learning.

If the class uses digitised content, and students are empowered to access the content through the media that makes the most sense to them, then teachers can move throughout the classroom zones of campfire, watering hole, and cave, both personalising and individualising instruction.

At Carey Baptist School in Melbourne, we saw examples of teachers collaborating on a Shakespeare unit by posting their best lessons and resources on a website. All teachers maintained a blog

Image 1 Cave



North Beaches Christian School's cave-type environment.

for students to read. Students collaborated both in class and online. Formative feedback from students and teachers occurred in the physical and virtual watering holes. Students and teachers vetted and shared final projects publicly. Creating this culture requires tremendous up-front planning, but once teachers make the content accessible through the ubiquitous learning platform, they are unrestricted to meet the needs of all learners.

Inspiring Educators

Of course, meeting students' needs requires time for ongoing, high quality professional development for teachers and administrators. At the Adult Contemporary Learning Hub at the Catholic Education Office's Newman Siena Centre in Perth, we visited a newly renovated professional learning facility mirroring the desired student learning design. The multi-use spaces accommodate teachers in their personal learning endeavors. Teachers work together in the social watering hole spirit; turn a discussion into a campfire opportunity; or find a quiet space to think, reflect, and create.

Educators do not have to be technology experts to use these ideas. They do need to be content experts and have a solid pedagogical background with a passion to reach the hearts and minds of today's digital generation. They need to knit together the content in ways that engage learners, extend learning outside the proverbial walls of schools, and transform the learning and teaching process. Educators need to think carefully about how to support exploration with guided questions and well crafted interactions.

Acknowledgment

Thank you to Lauren Parren, Laura Mina, and Jennifer Brandon for their contributions to this article.

Biography

Ann Davis, clinical assistant professor at the University of North Carolina at Greensboro, is a state level leader in 1:1 computing, leadership development, and coaching. She is the author of the USDOE Epic-Ed Framework.

Kim Kappler-Hewitt is an assistant professor of educational leadership at the University of North Carolina Greensboro. Her latest book is *Postcards from the Schoolhouse* (NCPEA Press, 2013).

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Training Tomorrow's Technologist

B Thomas

Co-Director of Technology Studies
Brisbane Girls Grammar

Digital Design showcase of Year 10
Multimedia



The Digital Design Showcase illustrates cross-disciplinary practice

The need for today's students to be innovative, self-managing and change-ready to contend with the complexities and challenges of the future continues to gain attention from researchers, education authorities and industry leaders (MCEETYA, 2008; Seely Brown, 2011). While technology teaching in schools varies depending on the learning context, resourcing, and leadership, the ultimate goal should be to train our students for a world that we cannot even envisage. Fostering scholarship for tomorrow's innovative and creative technologist requires a threefold quest: staying responsive to emerging technologies, understanding how to apply technology in educational contexts, and tailoring learning to suit our students' personal expectations.

The Technology Studies Faculty at Brisbane Girls Grammar School oversees the design and layering of information and communication technology (ICT) for cross-disciplinary learning endeavours, staff eLearning training, the learning management system, and elective curriculum studies. The technology curriculum includes elements of computer science, building client solutions, computer programming, information technology, and design technology.

Change is a constant for all sectors, not only education, with learning environments encompassing a much broader scope of technology resourcing and connectivity. The information available on the Internet constantly challenges us to rethink education while refining our notion of literacy. In addition, issues such as accessibility, privacy and reliability of information mean that the world has 'one big data problem' (Elbaz qtd. in Hardy, 2012). The data is at our fingertips, and can be tailored to our varying knowledge levels and appetites. The ambitious thinkers of

tomorrow will need to digest and manage 'big data' in inventive, migratable and sustainable ways.

As educators, we need to ask how our assessment and learning culture encourages our students in digital technology innovation and enterprise. In some ways, the structured rhythm of the school day (McWilliam, 2012) can impede deep integration and considered cross-disciplinary inquiry.

In 2001 Dr Judith Ramaley coined the acronym STEM with reference to science, technology, engineering and mathematics (Chute cited in Daugherty, 2013). She defined STEM as an educational inquiry placing learning in a real-world context, thereby creating opportunities in the pursuit of innovation (Daugherty, 2013). Recently, several academic papers have emerged on the integration of the arts into the STEM paradigm — to create STEAM — for educators attempting to reinvigorate the role of creativity and innovation in STEM (Daugherty, 2013). Rhode Island School of Design presents STEAM as the contemporary way to foster new approaches to innovation by 'combining the mind of a scientist or technologist with that of an artist or designer' (RISD, n.d.). Lewis (cited in Daugherty, 2013) notes that technology education, like arts education, 'has always had to contend with the question of its legitimacy as valid school knowledge'; historically, both subjects entered the curriculum based on utilitarian rather than academic rationales.

Increasingly, educators and researchers are asserting the need for a greater infusion of creativity into traditional analytical curricula, such as those encompassed by the STEM disciplines (White cited in Mishra, Henriksen, & the Deep-Play Research Group, 2012).

Brown (2009) concurs, suggesting educational focus on analytical and convergent thinking is so dominant in schools that most students leave school with 'the belief that creativity is either unimportant or that it is the privilege of a few oddballs'.

This year, the Technology Studies Faculty had the opportunity to apply a STEAM-style philosophy and engage in valuable cross-disciplinary analysis and practice. In liaison with the School Psychologist, Director of Humanities and Dean of Students, we established a theme for the annual Digital Design Showcase. 'Women Warriors of Folklore' was selected as a stimulus for the girls to reflect and investigate the misrepresentation of women in pop-culture. The Year 10 Multimedia and Interactive Technologies (MIT) project commenced with a stimulating presentation from Ms A Dare, Director of Humanities, regarding the historical origins of women warriors. The responsibility of contributing to the current representations of women through the creation of individual digital design was discussed with the Year 10 students. This year's assessment piece was enriched beyond just the development of digital skills. It also incorporated societal and historical dimensions as our Year 10 girls were given the chance to create a technology project that presented women through a desexualised lens of visual representation.

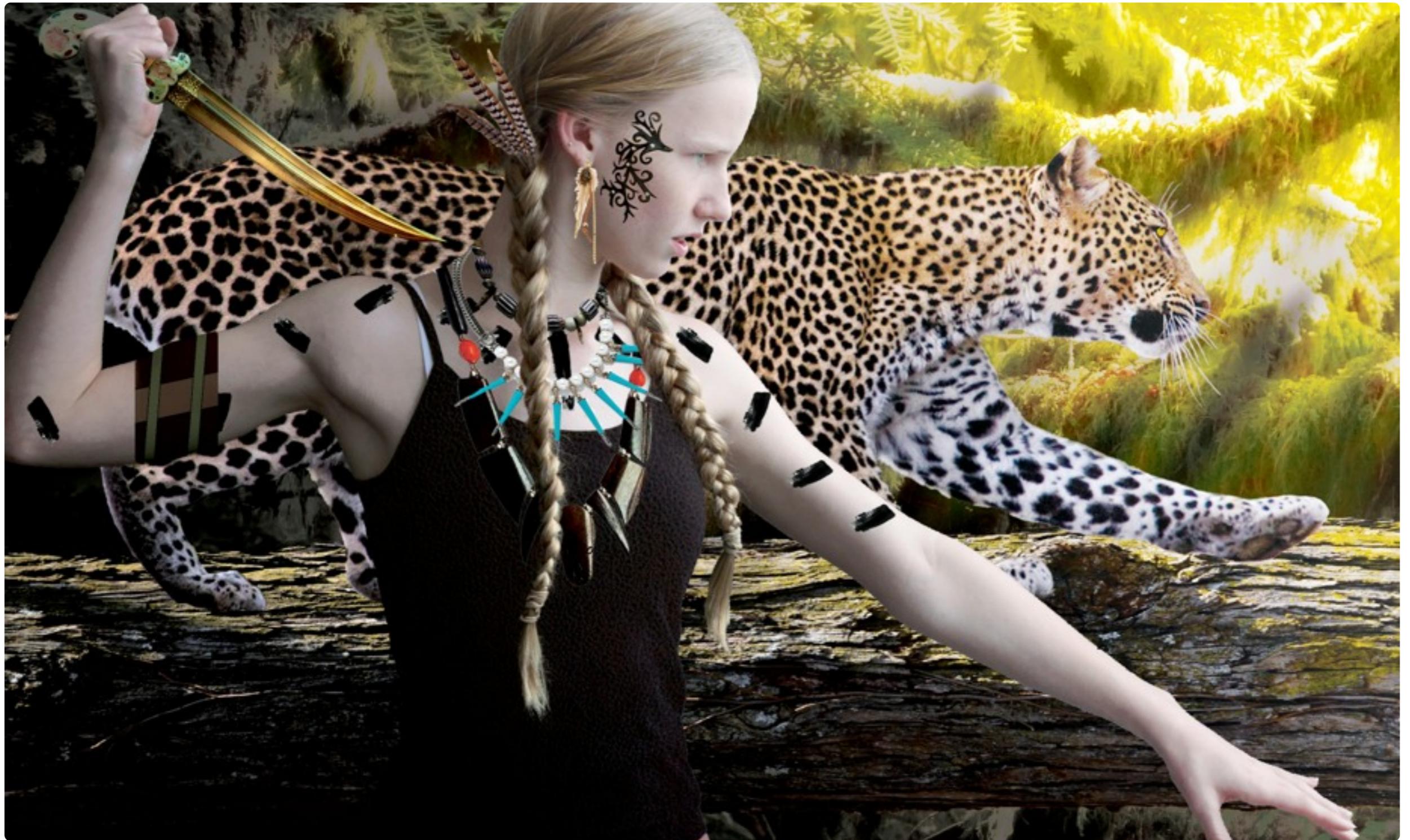
The Digital Design Showcase presented design and illustration of vector and bitmap imagery for print, video and textile design. Year 9 and Year 10 MIT students now move onto developing and applying problem solving in algorithmic logic and abstraction associated with programming digital games and robotics. The MIT subject encompasses engaged learning strategies to actively involve students in meaningful interactions with technology. Girls

gain understanding and acquire skills in MIT as they respond to a broad range of complex technological challenges.

Teaching strategies in MIT include challenges in inquiry and problem-based computational thinking. Project-based learning stimulates critical thinking, collaboration, and decision-making processes and focuses on student-centred learning with authentic tasks. Cyber safety, cyber bullying, and social and ethical issues, as well as concepts of computer systems, are integrated throughout the two year course. Other recent cross-disciplinary ICT endeavours have included English cyber poetry, Science animations to represent the life of atoms and molecules, Drama multimedia backdrops and 3D digital stage design, Humanities pop culture and geographic websites, and video productions involving various subject areas.

If we are to train and nurture the bright and fertile minds for tomorrow's 'conceptual age' (Pink, 2005), we will need to reflect in greater detail new ways of seeing rather than simply looking (Root-Bernstein & Root-Bernstein cited in Mishra, Henriksen, & the Deep-Play Research Group, 2012) at unconnected educational elements. Focusing on genuine and shared curricular prototyping engages our students as seekers of knowledge rather than receivers of information (Brown, 2009). To do this, we need a framework of skills and thinking that can be built into lessons and learning experiences that are rich in creativity and technology (Mishra, Henriksen, & the Deep-Play Research Group, 2012).

Gallery 2.1 Winning entries from the MIT Design Showcase at Girls Grammar



Biography

Brendon is currently Co-Director of Technology Studies at Brisbane Girls Grammar. His management and leadership involves ongoing development of technologies curricula and also supporting the wider school leadership of staff eLearning and digital pedagogies.

Over the last thirteen years of his teaching career he has worked with district and state Queensland Studies panels and subject weights analysis. Brendon is also a part time sessional lecturer and tutor for the School of Education and Professional Studies at Griffith University, Queensland. His work with the University is focused on pre-service teacher training; Communication Technology, Multimedia and Information Communication Technology. His interest in curriculum design and technology for teaching and learning led him to partake in the development of national curriculum course notes for this the State Library Queensland's exhibition, Floodlines 2012. Brendon was awarded QSITE Emerging Leader of the Year Award in 2012.



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Hanging out to Build our own Learning Network

Amanda Rablin QSITE and
Roland Gesthuizen ICTEV

Video conferenced panels
discussing educational issues
and building a professional
learning network.



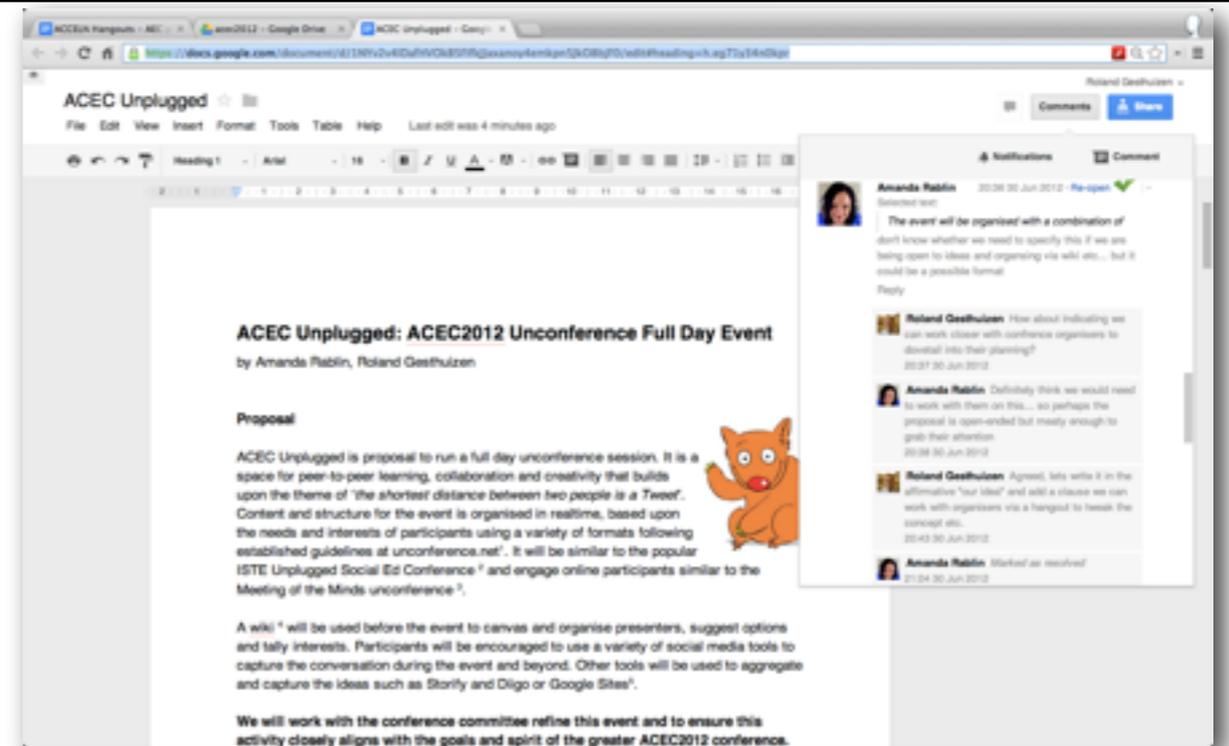
ACCELN 'Hangout' online videoconferencing panel

A simple idea can lead to interesting places, especially when creative and enthusiastic individuals are involved who lead chaotic lives. The starting point for our learning adventure was an interstate tweet: Amanda to Roland “Hey, want to co-host an unconference for ACEC2012 with me?”. This unconference event lead to the creation of a new online community that we co-host each week. Calling itself the ACCELN (Australian Council for Computers in Education Learning Network) we have engaged educators and experts into discussions about issues in ICT and education and ideas that they feel passionate about. Whilst the community is still primarily Australian, the audience and guests span different international time zones. Like many unconference groups such as the TeachMeet Australia community (<http://teachmeet.net>), our ACCELN organised itself drawing upon the wider membership using a range of tools including a wiki, hashtag and shared online documentation. This report will detail its transition from an idea to a learning community and unpack how it works behind the scenes. An unplugged beginning.

The ACEC2012 unconference

We were busy planning an unconference activity as part of the ACEC2012 conference in Perth (<http://acec2012.acce.edu.au>), an event we called ACEC Unplugged and a space that was later lovingly called the “Space Bar”.

We used a Google Document this way over many evenings, chatted away about the possibilities and ideas about how we could best use this technology for great learning.



Whilst discussing our ideas online, we quickly identified two major hurdles. Our first was to rally a group that would be interested in an unconference event. The second was that many people who would be attending the conference would have no idea what an unconference event was.

In order to tackle these issues it was decided to explore leveraging a wider audience using a combination of tools including a shared document, survey form and regularly meet using a new Google messaging service called Google Hangouts.

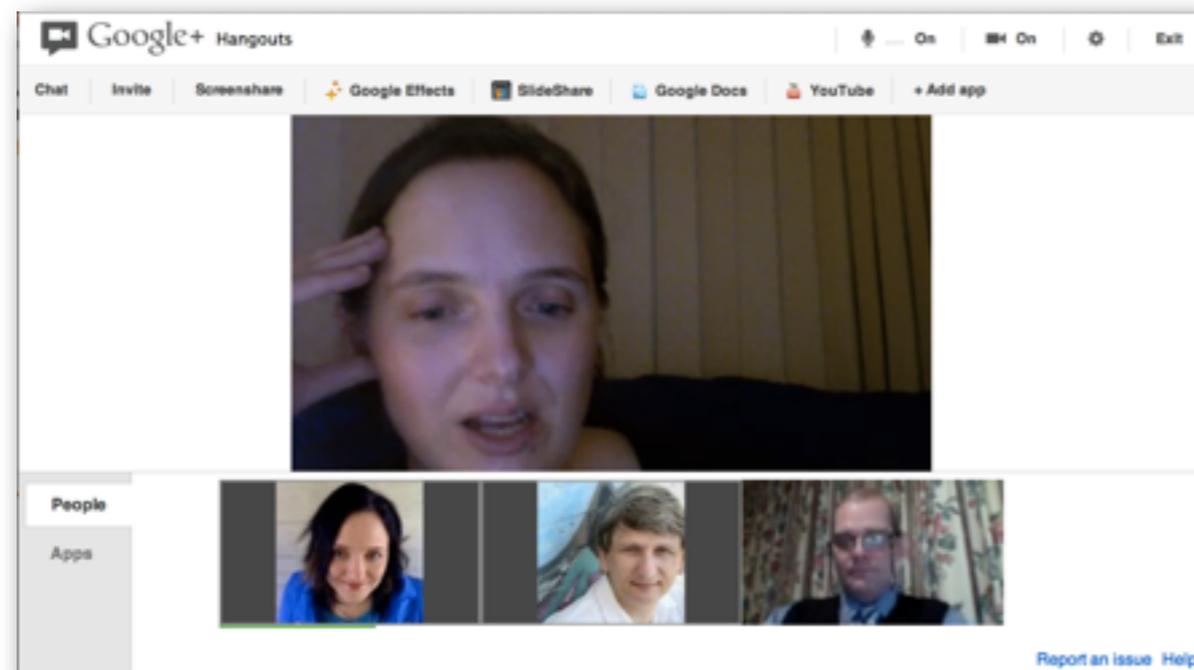
What is a Google Hangout?

A "Hangout" is a place set up within Google+ (<https://plus.google.com>) to facilitate group video chat with up to ten people at the same time. It is a social media service established by

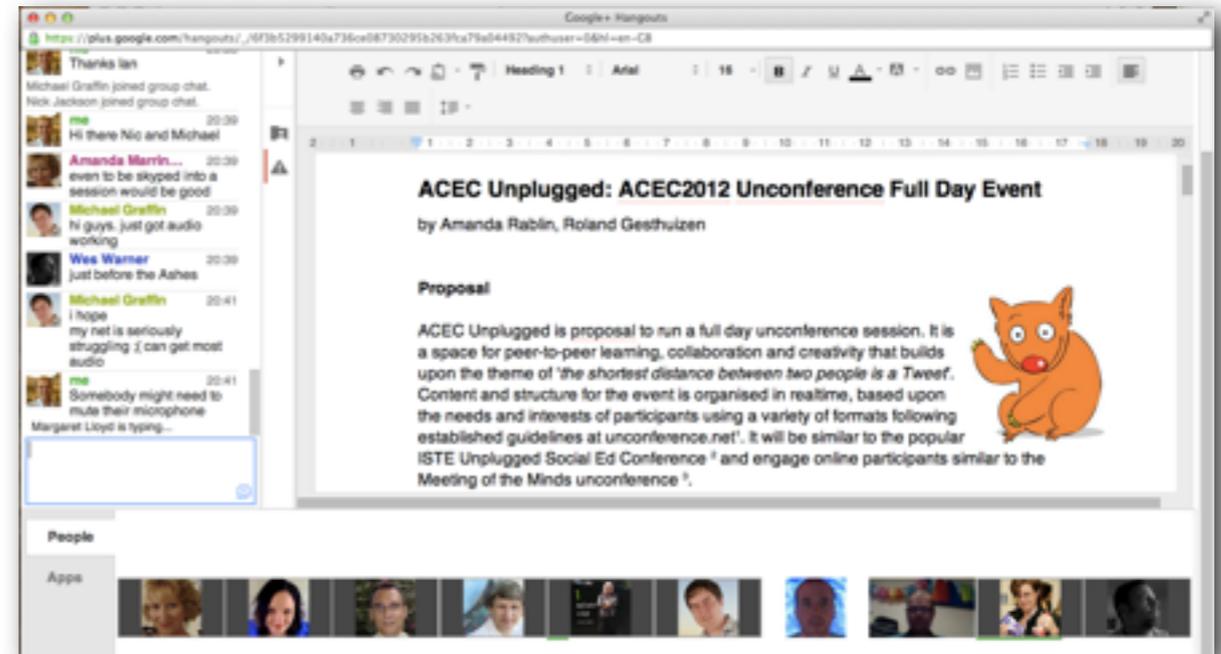
Google where guests can meet in a room that is shared via YouTube video channel.

Users can only join a hangout if they have the unique URL. This is generated when the hangout is created and distributed to an inner circle of private contacts who will become the invited guests on the panel.

Although Hangouts are part of the closed Google+ social networking service and require an account, they can be readily recorded, archived and publicly viewed by a wider external audience via a YouTube channel, enabled browser or device. Typically, the link to this live YouTube stream is distributed to a wider public by embedding the HTML code in another website that is further shared using social media.

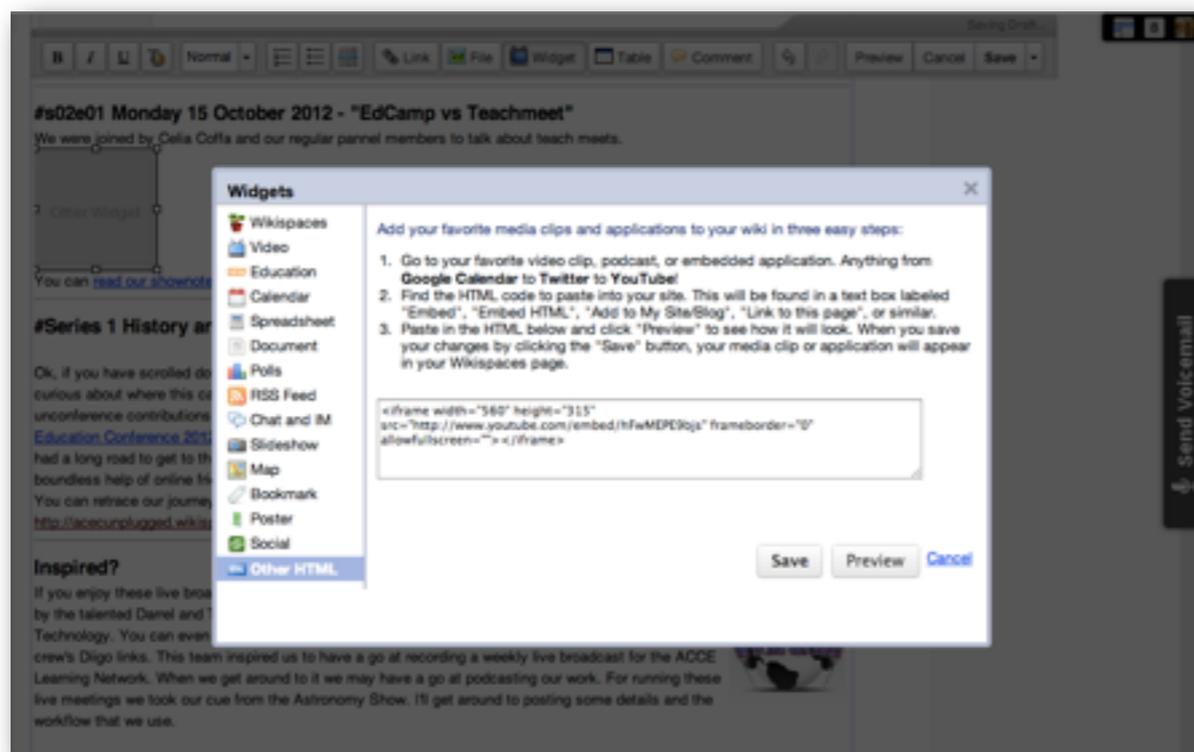
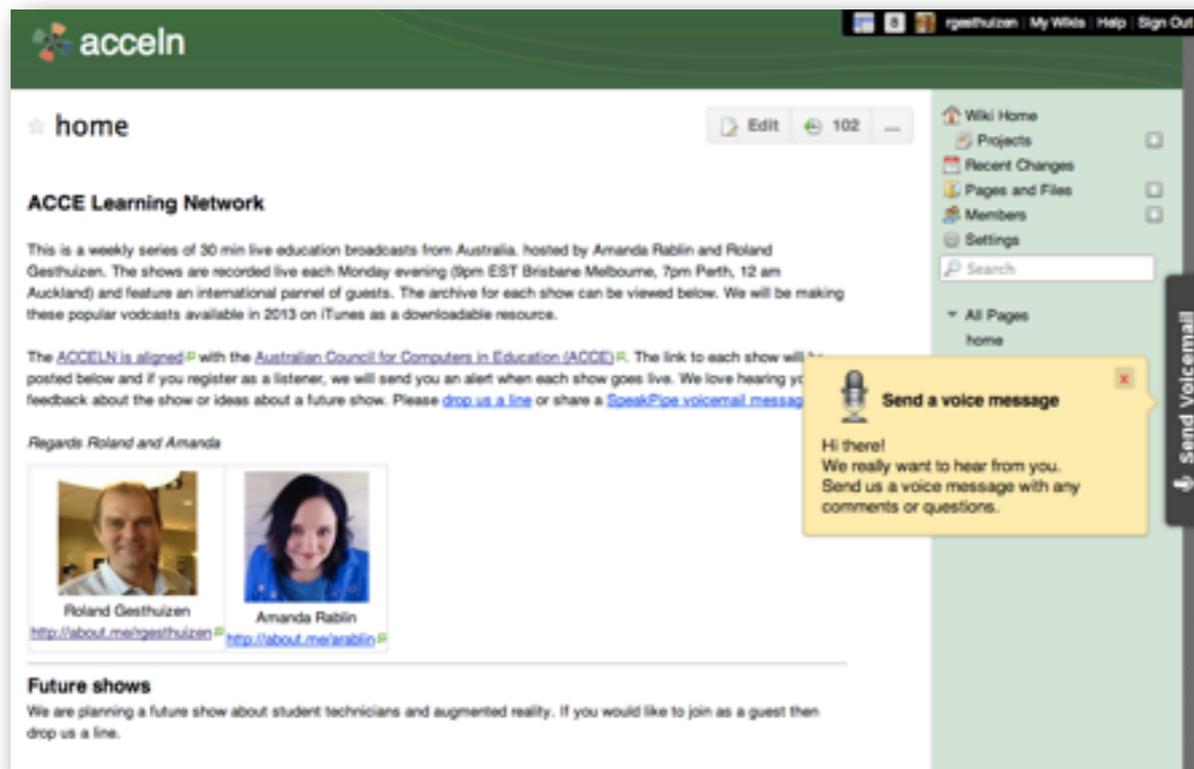


Our first broadcast season was rough mash of ideas as we tinkered with the technology, inviting educators and friends from amongst our personal networks to join us. From a small audience of just three participants, our group grew until it could draw upon the collective wisdom and regular support of several leading educators.

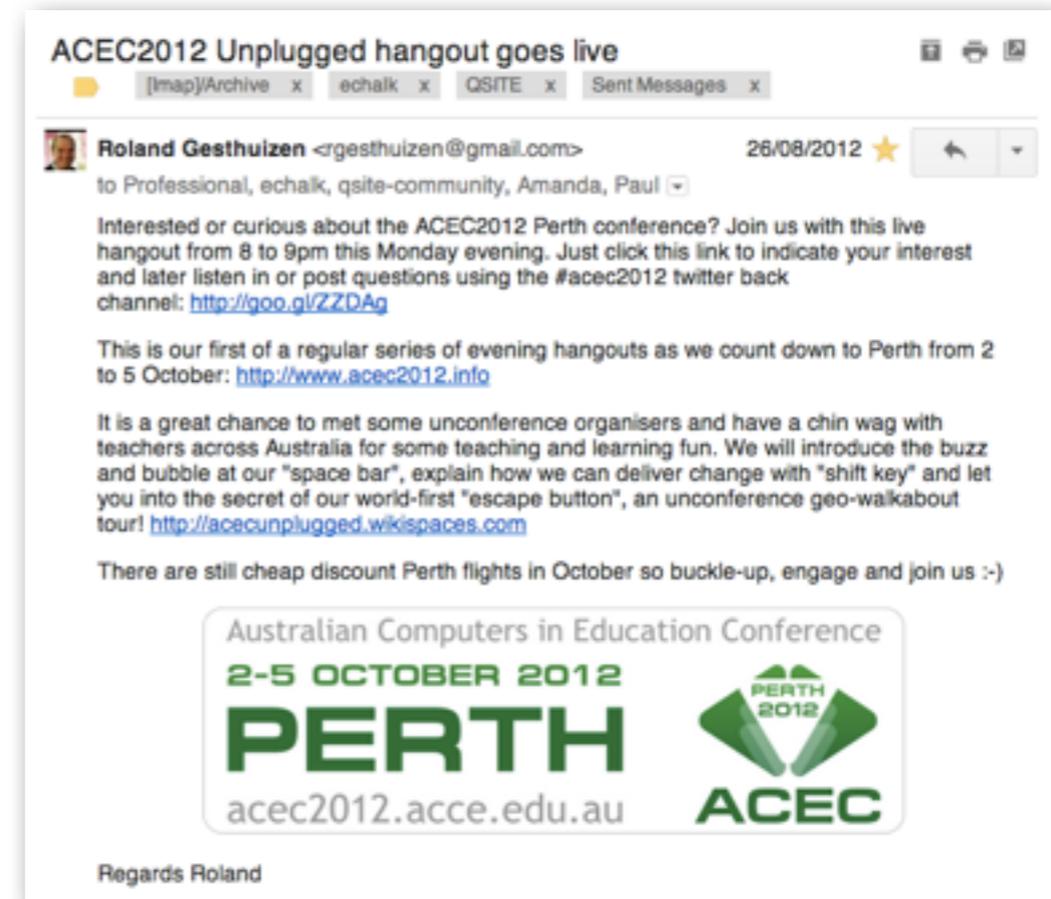


We set up a group home page using Wikispaces and posted a link to the current broadcast by adding the embedded html code directly before the show. Seasons and episodes were numbered and we began curating the archive of our past meeting videos.

Our group was now live and we could amplify our work to a much wider audience.



Following the encouragement of ACCE President Tony Brandenburg, our unconference team was called upon to help promote the activities of the wider Perth conference. We could drawing upon the conference organisers, speakers and keynote presenters. It was a novelty way for us to to socialise and share ideas, long before the formal conference.



The momentum of our social networking contributed significantly to the online engagement with social media during the conference as users switched attention from hangouts to the main conference. People unable to attend the event in person responded positively to the strong twitter stream and many viewed and participated in live streams of conference and unconference sessions.



Following the ACEC2012 Perth conference, it was decided that we should continue the momentum generated by our community and start a second broadcast season. Donna Benjamin from Creative Contingencies suggested it be called ACCELN, a learning network of connected educators that supported the broad goals of the ACCE (Australian Council for Computers in Education <http://www.acce.org.au>) and ISTE (International Society of Technology Educators <http://www.iste.org>) spanning our interests.

An early guest of our show, Sheryl Nussbaum-Beach from Powerful Learning Practice (plpnetwork.com) provided us with valuable feedback about how to scaffold discussions and dialogue using our shownotes. She also challenged us to engage our participants in meaningful action to apply the ideas that were explored. Another guest, Principal Don Collins from Coburg Senior High was able to share some valuable personal experiences about unconfereces and suggested that we increase our social

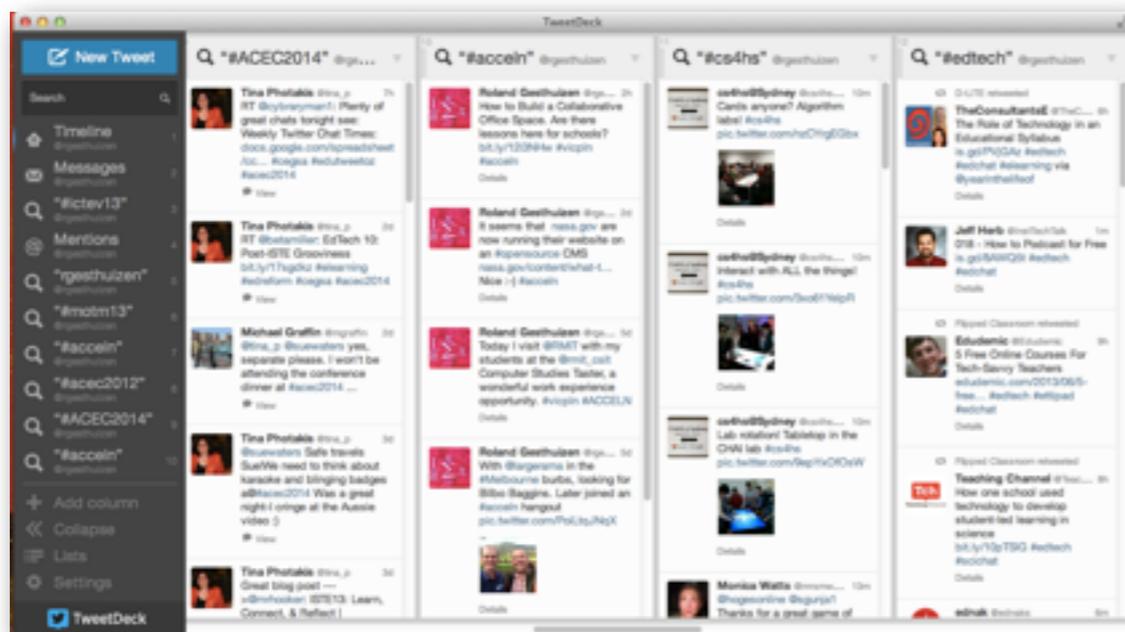
currency and engage our wider community with current issues by directly soliciting for new ideas.

We also obtained some valuable promotional ideas from the work by podcast pioneers Tony and Daryl of the Edtech Crew (<http://www.edtechcrew.net>), successful hangouts by shows including Astronomy Cast by Fraser Cain (<http://www.astronomycast.com>) and Ronnie Bincer (<http://www.thehangouthelper.com>). From these we established secondary documents to help guide our guests, a planning schedule using a shared spreadsheet and event notifications for viewers.

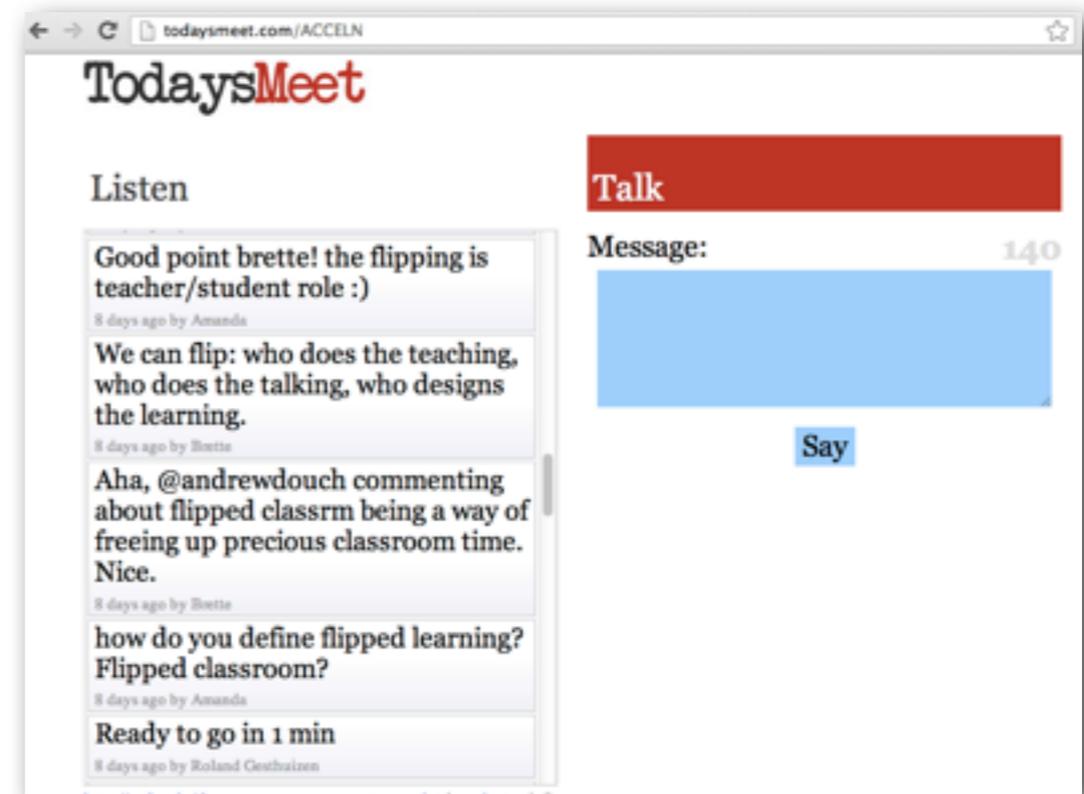
As we were now being drawn into a longer term commitment it was decided to keep the successful elements of our show, meeting each Monday evening at 9pm for the remainder of the year with wonderful guests and panel members. The timing of the show was deliberate so that the broadcast would span Australia across the same Monday evening from Perth (6pm) to New Zealand (12am).



It also meant that guests could be invited from Europe in the late evening and USA in the early morning. It was a challenging learning experience to directly juggle time zones and daylight saving changes across the year. It was hugely rewarding to meet new guests from across the globe whilst building a virtual community that would meet each week.



We added a chat room for online viewers using the free online service called TodaysMeet (<http://todaysmeet.com/aceln>) where users could share questions at any event with a back channel. We also began to promote the use of the #ACCELN Hashtag on twitter and Google+ to encourage discourse and announcements between shows and track community feedback.



Using all these tools enabled us to engage with an international community of leading educators, amplify their voice and ideas. It was a chance for us to connect with a bite sized chunk of our Professional Learning Network (PLN) and talk big topics, big issues and big ideas whilst having a lot of fun too!

Standby for broadcast: three two one recording start...

Behind the Curtains - How does a hangout work?

The most important aspect of our hangouts is the professional conversation that tends to follow. The discussions have a fire-side chat or round-table feeling with conversations that can run off on interesting tangents or focus on issues related to ICT in schools or education. Our panel consists of a few regulars who join whenever they can each week and each week, one to four new guests to the show. A technical constraint limits our circle of hangout participants to just ten members and occasionally a regular has exited their panel seat to allow a guest to enter.

What happens during a hangout?

The ACCELN event workflow includes some activities before, during and after each hangout. We could probably simplify the process and streamline the technology more, but here is what we do to organise each hangout.

Planning the event

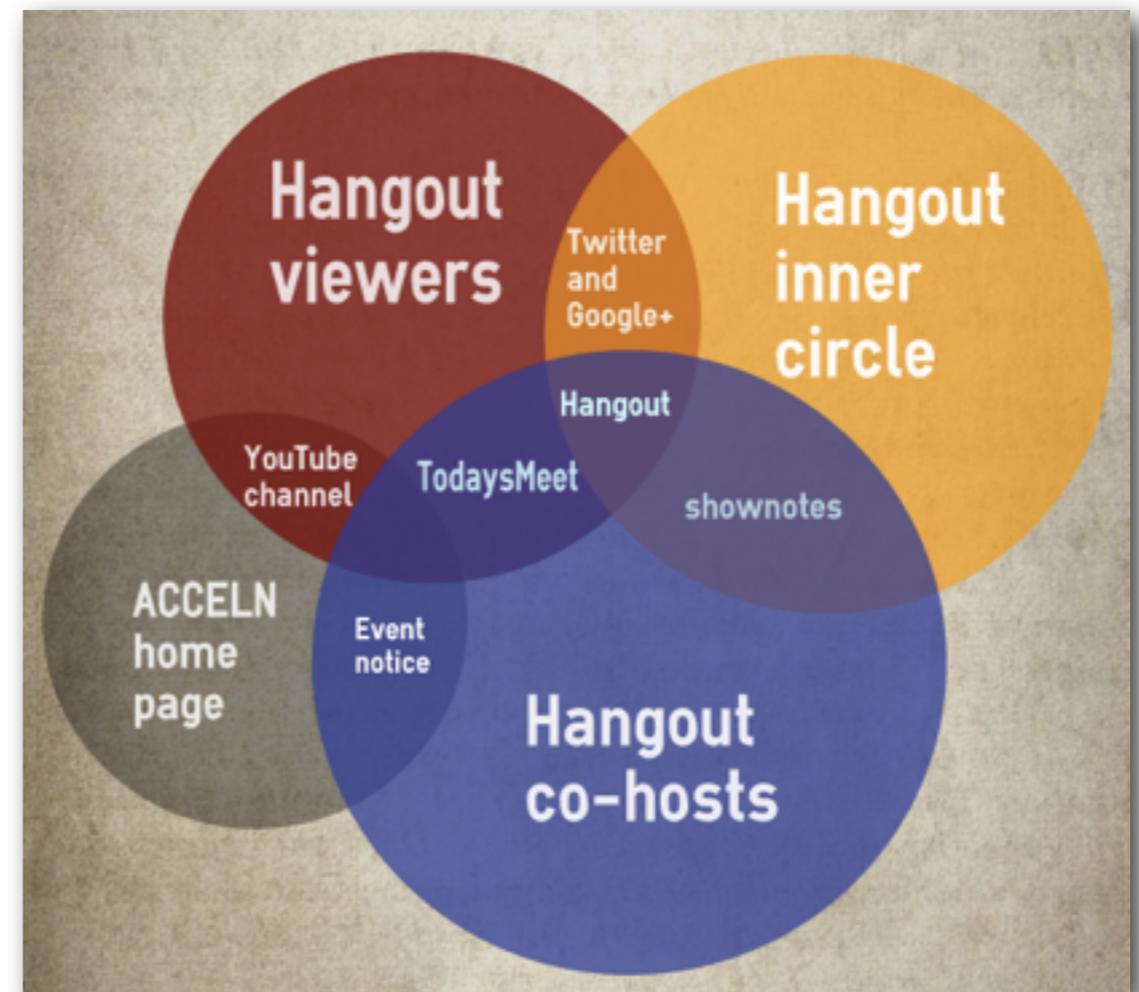
We coordinate our schedule of possible special guests and topics in a shared google spreadsheet. Once we pick an event and confirm with the key guests, we create a Google Plus event to promote the hangout to our circles and communities. On our ACCELN Wiki home page (<http://acceln.wikispaces.com>) we create a new event placeholder with some useful links on the wiki and then promote this link using the #ACCELN twitter hashtag to our mailing lists and state subject associations.

We also create a Google+ Event and share this notification to our PLN and social media groups. This allows us to track the level of interest in a show and identify any new members of our audience who would be interested in joining our panel.

Shownotes

The most important planning stage is to develop some shownotes for guests and hangout participants. We use a Google Document to write loose 'script' that guide the conversation and share this with participants, sometimes providing links and ideas whilst coordinating our thoughts and words.

Hangout communication Ven diagram



We also include guidelines for the participants and links to the hangout. The show notes include an introductory comment that helps us introduce each new guest and participant. They allow us to schedule questions during the show and allows us to organise our reflections at the close of the show. If there is a problem with one of us hosting the show, another regular guest can help support the other in this role. By watching each other's cursor, we can visually see what section we are up to and reading from.

Assembling an inner hangout circle

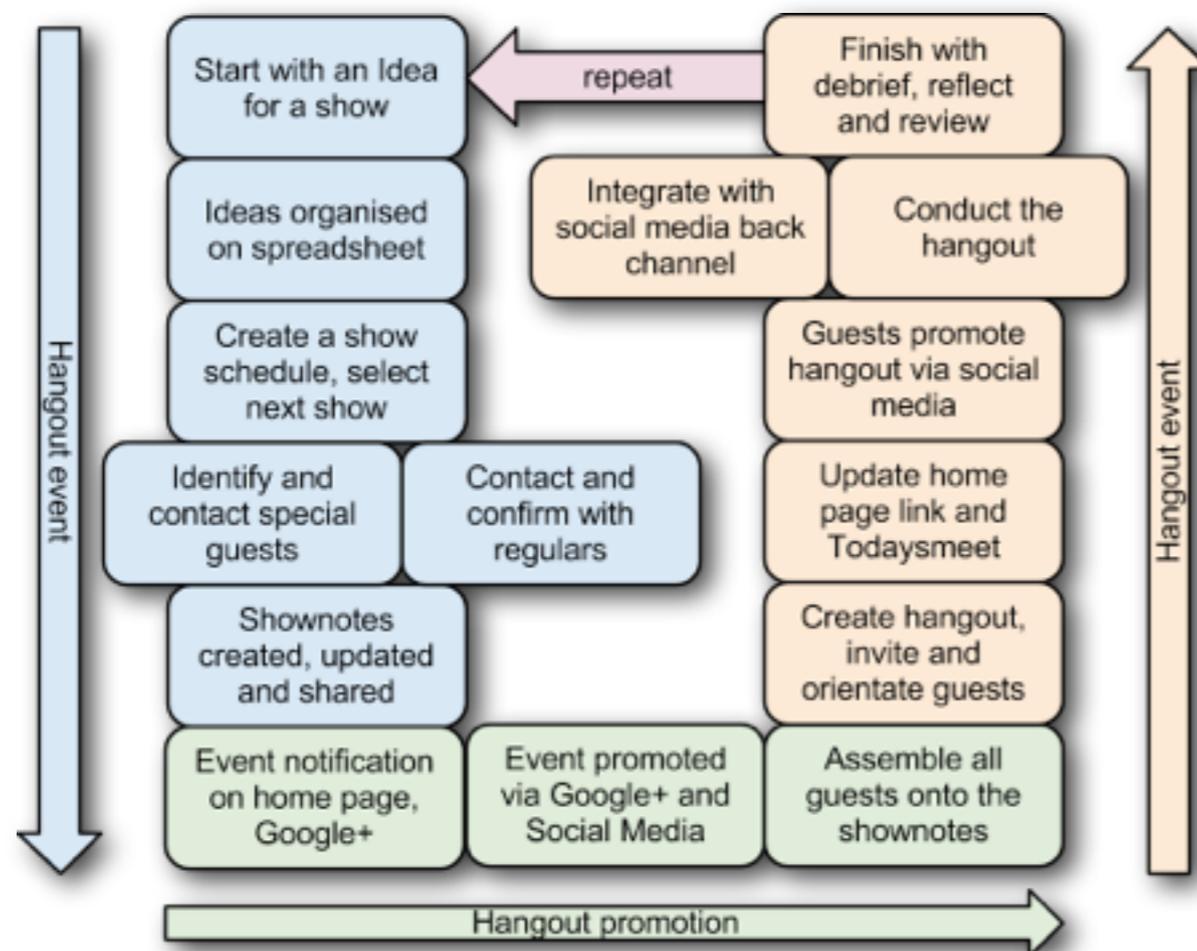
Before the night we select the members of our panel from amongst regular supporters and past panel members, guests and sometimes whoever we can find online from our networks to join. We have even invited members from amongst participants on our back channel to join us. Having more guests adds to the spontaneity of a show and lets us enjoy a greater flow of questions and shared ideas. By contrast, having fewer members allows us to drill deeper into the discussion and ideas put forward by a shows guest.

Supporting hangout presenters

We also have a presenters document (<http://goo.gl/MoY5N>) which explains how to set up for a hangout with their microphone, video, lighting setup and home office environment. It details how to set up their computer screen so that you can both engage in the hangout and read the shownotes and perhaps following the back channel to the hangout. It also reminds them to manage in advance any distractions and have some water handy, use google doc and in hangout chat to guide conversation.

Joining an hangout for the first time as a new guest is potentially a stressful experience so we emphasise that it is a fun online meeting with familiar and good friends. We reassure guests by injecting a tempered measure of humour and offers of support whilst answering questions about how we have dealt with previous technical issues and problems.

Hangout Information flow chart



ACCELN Hangout Notes for Participants

by Amanda Rablin and Roland Gesthuizen (16 Sept 2012) Original: <http://goo.gl/37h61>



Welcome to the wonderful world of live broadcasting with Google Hangouts.

Week before the show

- Read these before the show and ask any questions you may have.
- Read the shownotes for the hangout we are running
- Enter some details, questions or links to help kick things along

On the day of the show

- Adjust your room background lighting, illuminate your room.
- Don't sit in the dark, its creepy.]
- Adjust lighting onto your face. Back or top does horrid things with my balding scalp.
- Put away your washing, laundry, tidy shelves.
- Adjust your chair and web camera. Test your microphone.
- Put a water bottle nearby or a nice hot cup of tea.
- Explain to the family what you are doing and why you need ALL the Internet bandwidth.
- Feed the kids, walk the dog. Practice listening and nodding politely to the dog.

An introductory tour

Directly before the show we assemble guests in an online green room using the shownotes and explain how they can set up their lower-third title bars. These are an important way to communicate their name and twitter handle. We encourage them to share the link to the ACCELN homepage and hangout to their PLN and social network. We also orientate new panel members to explain how the buttons in Google Hangouts work. Occasionally Google will conspire to surprise and challenge us with an upgrade, new features or changes.

Five, four, three, two, one... launch

Before the show we copy and past a block of HTML code to embed a YouTube viewer for our show in the ACCELN wiki home page. We use this to show and explain what to do if there are any technical problems during the live broadcast. These precious few minutes of orientation with hangout participants allow us to brainstorm new questions and settle any nerves as we count down to the scheduled broadcast start and program launch.

Integrating a back channel

During the hangout we often share questions posted online by the backchannel from listeners who are following the stream remotely. It is important so that our listening audience is permitted an opportunity to engage with the debate and dialogue. This can be done using the TodaysMeet chat room (<http://todaysmeet.com/acceln>) or #ACCELN hashtag.

There is a great flow of ideas and contributions for the different channels although at times it can be a challenge to juggling between listening to the panel, following the internal discussions posted inside the hangout and sharing questions posted by listeners from outside the hangout. This is one of the key reasons that the show has at least two hosts.

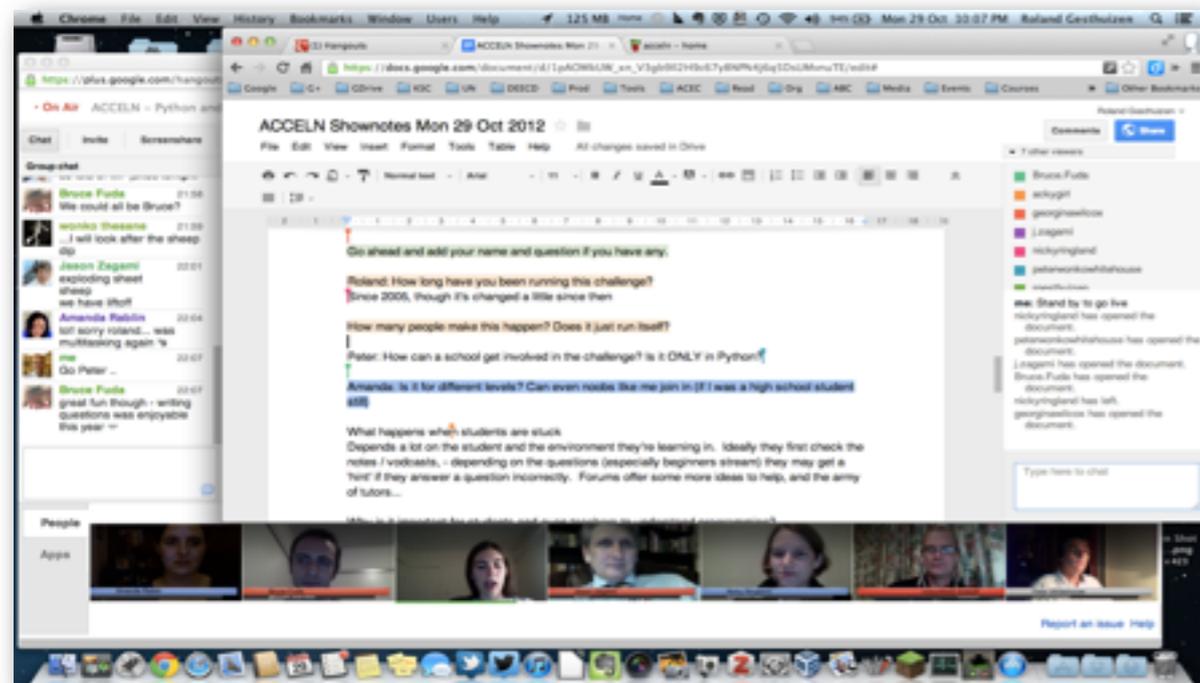
Scaffolding to build a show

As hosts, we have a couple of different strategies for helping drawing out discussions and questions from our guests. We provide scaffolding within the show to stimulate good questions and elicit the sharing of diverse experiences.

Whilst we encourage guests to listen to each other and reflect upon what is being discussed, this discussion is posted on an internal chat window that isn't recorded. It allows us to vet and cue questions, share the workload and resolve any technical issues. As hosts, we also add human element to the hangout. Where appropriate we may interject to ask a question or provide a reality check, injecting some humour with a funny blue hat or some adhoc quotes ghojwI'pu'li' tISaH (Klingon for "Care about your students").

Reflecting upon the close

The closing conversations usually starts at around the 30 minute mark and starts the process of finishing each broadcast. It gives us a last chance for guests on our twitter and today'smeet back channels to contribute. We invite every panel member to contribute a last word in a round table style. This is often where the most interesting elements of the discussion emerge and ideas

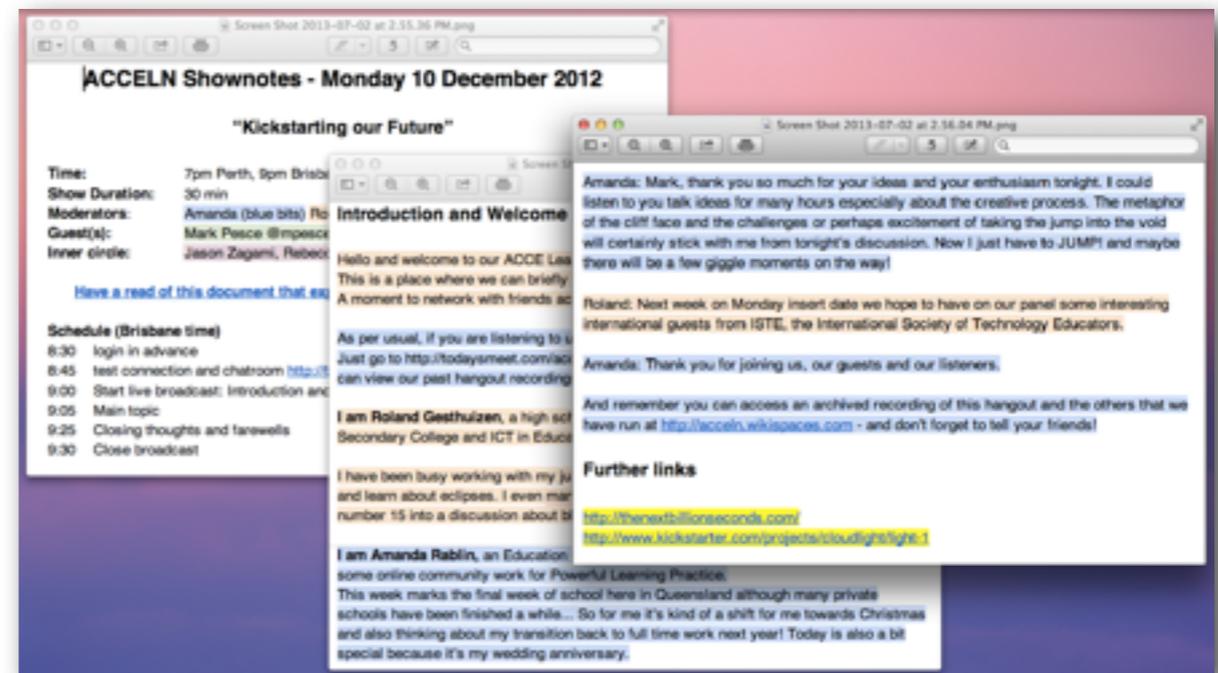


are applied and extended to different contexts. Then we close each show with a summary of our personal reflections; thanking everyone for their contributions.

Deconstructing each show

When the recorder is turned off and we are off the air, we start a debrief with panel members for feedback about what worked and what didn't work so well. Afterwards we invite a free discussion about any topic. Many aspects of our show and future topics have come from these open discussions. Sometimes our guests and viewers have continued to discuss ideas on the back channel, long after the broadcast is finished. After a sweep to tidy the shared shownotes, we restart the cycle for our next show.

The following section details some of the things that we learned during these show reflections and the wonderful guests that supported each show.



What do we discuss and what did we learn?

The following tables present broadly grouped areas of discussion and some reflections in these areas. These have been aggregated and synthesised from contributions we made at the close of over 30 different hangouts. Many more shows are planned.

The Future

Each Monday night has become something for us to look forward to; a time to (re)connect with peers and experts and engage in meaningful shared learning as classroom teachers and education leaders. Over time we have become more established in the processes we use to run the hangout and continue to push the calibre of conversation further each time. As changes to ICT in schools (curriculum, structures, approaches to learning etc.) become somewhat more formalised conversations and shared action become even more important. Although we coordinate the program each week, it has never really just been about us. The final program schedule developed has been an effort to capture the conversations, the ideas and the connections from amongst the shakers, movers and leaders in our education world. Our fingers are held lightly upon the pulse of education in Australia.

It is our hope that the ACCELN community will continue to grow and to support a range of initiatives through our ICT professional associations, particularly as the Digital Technologies curriculum reaches implementation. Our schedule of hangouts continues to evolve and we look forward to hosting guests to talk about the birth of the Internet in Australia, the new Federal Minister of Education and Our community started with a question mark

before an unconference. The dialogue we are helping add with our learning network recordings may become quotation marks that help frame the broader ICT education debate. We look forward to working with many other educators to grow the conversation into learning and action.

To infinity and beyond: three two one broadcast end.

STUDENT LEARNING AND STUDENT-DRIVEN PROJECTS	SPECIAL GUESTS
<p>Shows: Film, Tech Support, Kids Connect, Flat Classroom, GenYES, Flipped Classroom and Student TV stations</p> <p>The teacher is a learning expert who can invite students into the process and value their leadership and input into the learning community. Handing over the keys of knowledge and letting kids take part in their learning journey is about stimulating a student voice, and listening. We must be conscious how adept our young are and the extent to which they draw upon peers for support. It isn't necessarily about giving up labs or control but allowing computing to be genuinely mobile, embracing digital citizenship.</p> <p>Teachers don't have a monopoly on learning and our school curriculum does not have a monopoly on creativity. Some things don't need to clutter our class and can be examined afterwards. We can rearrange content to help release things to a better time. Encouraging students to create their own content and share reflections is a double flip towards student centred learning and student responsibility.</p> <p>An authentic student voice is something we aspire to but rarely manage to reach. We need to involve students in issues that they are passionate about such as Cybersafety, eSmart, Digital Citizenship and how they learn best as a community.</p>	<p>Tim Kitchen Bruce Fuda Jason Zagami Nick Jackson Tess Armstrong Paul Bethel Sylvia Martinez Amanda Marrinan Julie Lindsay Mark Richardson Paul Shaw Paula Thomas Wes Warner Peter Whitehouse Vicki Davis Michael Graffin Andrew Douch Sonya Stattmann</p>

BUILDING A COMMUNITY OF PRACTICE AND SHARED ONLINE SPACES TO LEARN	SPECIAL GUESTS
<p>Shows: Scootle Community, Slide2Learn, Meeting of the Minds, Unconferences and social networks, MOOCs and beyond, Planning for ACEC 2014 and Reflecting on ACEC2012</p> <p>Many of us teach how we were once taught. Changing this is going to be a challenge if we don't embrace ideas from all the stakeholders and read the research. Any transition must be undertaken in manageable steps inviting the teacher, parent and definitely students.</p> <p>It is important to consider pedagogy, technology and learning spaces together. We need to fearlessly embrace digital citizenship and embrace open solutions such as Linux, OpenOffice, GoogleDocs and Open Source software. Learning comes first; the technology tail should not wag the curriculum dog. LMS tools like Moodle and Edmodo help us to amplify our teaching, community building tools like Scootle can help us connect our learning. The challenge is how to give everybody the same access to learning without lowering the pedagogical bar.</p> <p>Teachers are interested in the community, collaboration, consultation, digital influence and the learning that they want to help create. Scootle is a national playground for teachers or a user driven virtual staff room. It isn't a hoverboard (yet) but it is fast becoming one for Australian teachers.</p>	<p>Tony Brandenburg Bruce Fuda Chris Betcher Jason Zagami Julie Lindsay Michael Graffin Jenny Ashby Chris Betcher Derek Bartels Kate Maccoll Peter Whitehouse Andrew Williamson Mel Cashen John Thomas Tony Richards Sheryl Nussbaum-Beach Amanda Marrinan Wes Warner Judy O'Connell Tania Sheko Nick Jackson Jackie Knipe Donna Benjamin Luke Pearson Tina Photakis Christopher Dawkins Don Collins</p>

ICT AND A NATIONAL CURRICULUM PERSPECTIVE	SPECIAL GUESTS
<p>Discussions around the Draft Digital Technologies Curriculum, Computational thinking and Computer Science</p> <p>The critical change for some teachers was to first see computing and the Internet as something more than just a source and destination for their word processing. It is about integrating technology and learning goals across the curriculum as much as it was about networking devices.</p> <p>How can our professional associations articulate computational thinking to other learning areas, develop shared practice, learning and examples of what it really is and could be. WE need to develop robust structures for professional learning where teachers are learners and inquirers.</p>	<p>Brette Lockyer Bruce Fuda Jason Zagami Fran Hughes Hugh Miley Jenny Ashby Nicky Ringland Lois Smethurst Amanda Marrinan Derek Bartels Wes Warner Marg Lloyd Penny White Brendan O'Brien Jean Anning Peter Whitehouse Chris Betcher Nicky RInglan Georgina Wilcox</p>

IMPLEMENTING ICT INITIATIVES AND SUSTAINABLE CHANGE	SPECIAL GUESTS
<p>Shows: AITSL Professional Standards and PD tools, BYOT/BYOD, Kick Start Projects, Open Data and Open Government, and Online Learning Tools</p> <p>Schools and organisations have an important role to provide on-ramps for teachers. We all need time to tinker, explore and make. We have moved from teaching how to cutting HTML code to building content management systems and apps. More than just using software it's about the users and developers working together to make a better product. Schools do best with BYOD at the senior levels when they engage BYOD discussions with the entire school community.</p> <p>Lifelong learning and iterative policy, knowledge creation are powerful ideas. Open teaching / open learning / open schools; what will they look like? Think of "school as API". How do we access, use, share or visualise the data we have? The fear of letting go is bigger than the fear of what we may gain if we do. Cultivating trust is important, perhaps that is our first leap.</p>	<p>Bruce Fuda Chris Betcher Martin James Gavin Pinnington Jason Zagami Keren Caple Nick Jackson Peter Whitehouse Pia Waugh Mark Osborne Randy Orwin Jason Arruzza Julie Lindsay Paula Thomas Julian Ridden Mark Richardson Phil Brown Mark Pesce Peter Lake Rebekah Brown</p>

Biography

[Amanda Rablin](#) is coordinator at St Peters Lutheran College, QLD. Amanda has been providing support to teachers and schools in curriculum planning with a focus on ICT for over 10 years. She has dedicated her career to helping teachers face ICT challenges and produce meaningful student learning. She is a leader with a passion for ICT and exploring its impact on learning, teaching and communication in our society.



[Roland Gesthuizen](#) is eLearning Coordinator, DEECD Victoria and on the ICT in Education Victoria State Council. Roland is a leading secondary school educator, wordsmith and social-media evangelist who enjoys teaching information technology and science. Roland was on the state board of ICTEV (ICT in Education Victoria) and VITTA (Victorian Information Technology Teachers Association).



Season 1

Episode	Aired	Topic
#s01e01	Monday 10 September 2012	Ideas for the Unconference and Reflecting on Connected Educator Month with Sheryl Nussbaum-Beach
#s01e02	Monday 17 September 2012	Digital v Real life, mobile learning and MOOCs. Does this change everything?
#s01e03	Monday 24 September 2012	"Getting what we've always wanted"
#s01e04	Monday 1 October 2012	"Unplugged and in Perth"
#s01e05	Tuesday 2 October 2012	"The Unconference!"
#s01e06	Tuesday 2 October 2012	"The Leadership Forum"
#s01e07	Monday 8 October 2012	"Conference Debrief"

Season 2

Episode	Aired	Topic
#s02e01	Monday 15 October 2012	EdCamp vs Teachmeet
#s02e02	Monday 22 October 2012	Drupal: come for the software, stay for the community
#s02e03	Monday 29 October 2012	Python and the NCSS Challenge

Season 2 (continued)

Episode	Aired	Topic
#s02e04	Monday 5 November 2012	The Flat Classroom
#s02e05	Monday 12 November 2012	Meeting of the Minds
#s02e06	Monday 19 November 2012	Kids Connect
#s02e07	Monday 26 November 2012	Slide to Learn
#s02e08	Monday 3 December 2012	Bring your own Thinking
#s02e09	Monday 10 December 2012	Kickstarting our Future
#s02e10	Monday 17 December 2012	To ISTE and beyond

Season 3

Episode	Aired	Topic
#s03e01	Monday 18 February 2013	Building a better Internet for children
#s03e02	Monday 25 February 2013	Growing the Technology Curriculum
#s03e03	Monday 4 March 2013	The Times They Are a-Changing
#s03e04	Monday 11 March 2013	Open Eyes, Ears, Hearts and Minds
#s03e05	Monday 18 March 2013	National Computer Science School

Season 3 (continued)

Episode	Aired	Topic
#s03e06	Monday 25 March 2013	Deakin School News Network
#s03e07	Saturday 13 April 2013	Hanging Out for Professional Learning
#s03e08	Monday 15 April 2013	"Stage one" Digital Technologies Curriculum
#s03e09	Monday 15 April 2013	Online and Social memories of ACEC2012
#s03e10	Monday 29 April 2013	Bring it and you can use it (BYOD/BYOT)
#s03e11	Monday 6 May 2013	Cutting through the Noise
#s03e12	Monday 13 May 2013	Looking forward to ACEC2014
#s03e13	Monday 20 May 2013	Scooting towards Scootle Community
#s03e14	Monday 27 May 2013	Ready Set Roll
#s03e15	Monday 3 June 2013	Empower Students, Change Lives (Yes Gen)
#s03e16	Monday 17 June 2013	Moodling Around
#s03e17	Monday 24 June 2013	Lets Flip for IT (Flipped Classroom)
#s03e18	Monday 15 July 2013	To the LMS and Beyond

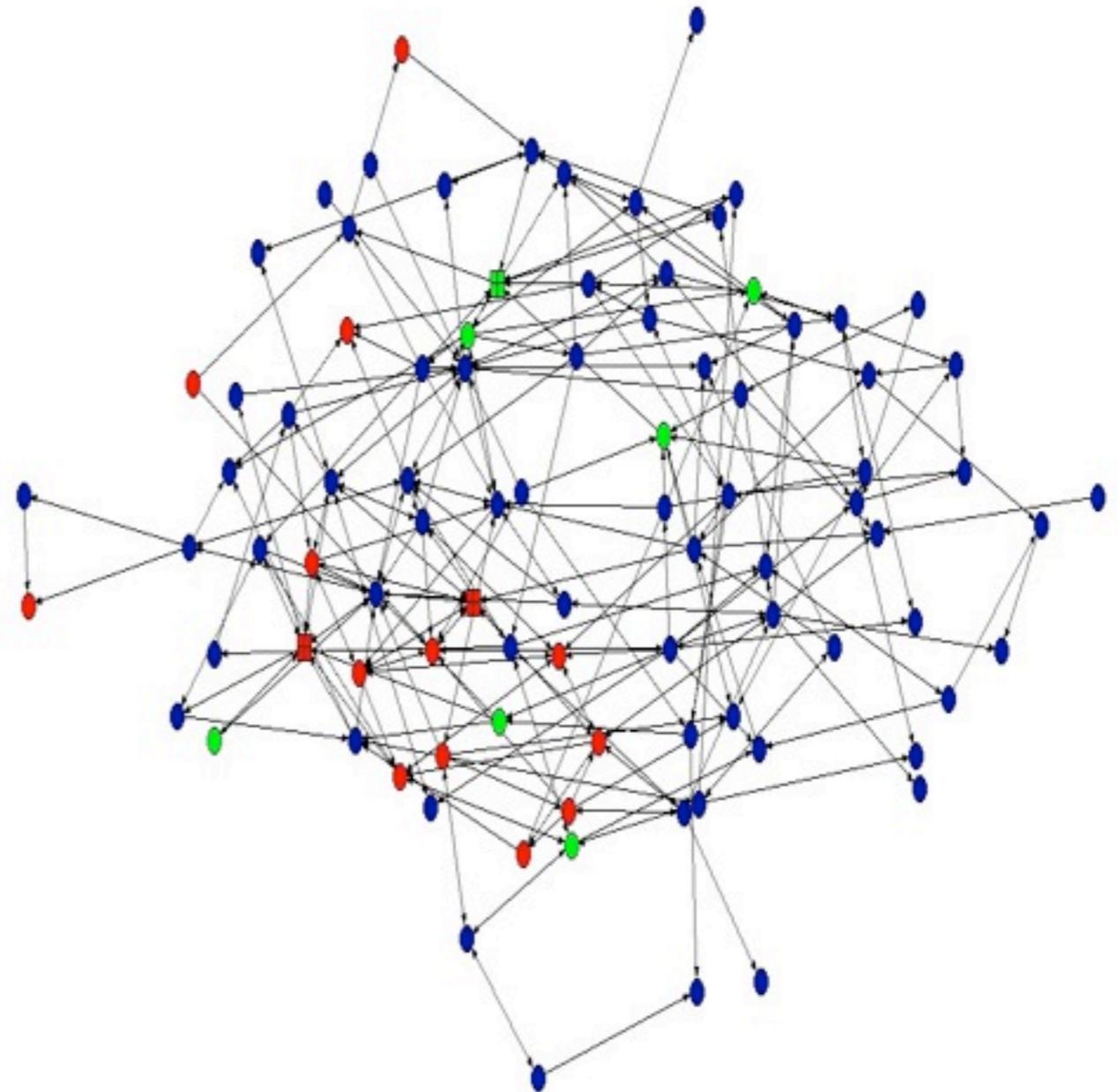
Who you know and what you know

Student Interaction in Online Discussions

Tony Stevens

Abstract

The dynamics of how students respond to each other during online discussions in a blended learning environment remains under-explored in the literature. How this technology shapes interaction when used in conjunction with traditional teaching methods and the practices of learners in these multi-site situations is a significant educational issue. Using mixed-methods, this study drew on social interaction constructs such as: exchange theory; reciprocity; and propinquity to explore practices within a discussion forum in a blended-learning setting. In addition to confirming these well-established constructs accounting for student-interaction, the issue of responding to others perceived as 'knowledgeable' was uncovered, and the mechanisms behind this particular response were examined further. The study reveals an assemblage of practices overlapping and inter-locking with the emergent learning experience, in both online and traditional spaces.



Introduction

Research on asynchronous online discussions ('computer conferencing') in education is now well-established (Hammond, 2005). The early themes – instructional design and formatting; links to social constructivism; and collaboration and interaction during learning – were recently extended with: analysis of content mapping for evidence of higher-order thinking (Schrire, 2006); discourse of interactions (Liu & Tsai, 2008); and the development of critical thinking skills (Richardson & Ice, 2010). Critique on the value of exploring online discussions spans a continuum from the view that online discussion is just a transaction – not a learning experience at all – to the suggestion that it offers the potential for a 'radical re-shaping of rhetorical space [with] plenty of scope for researchers to reflect on the kinds of instructional design principles that best exploit this potential' (Thomas, 2002; Locke, 2007 p.198). Detailed analyses of teacher-student interaction (such as that of Wallace, 2003) focus on broader aspects of online learning, leaving the matter of the day-to-day experience of the student in computer conferencing relatively uncharted.

Contemporary research on asynchronous online discussions shows a trend towards the employment of mixed methods, with some notable examples integrating LMS data with analysis of content (text). Studies in this genre explore issues such as the: 'health' of a discussion based on message flow; time-delays in response patterns and responses; or 'threads' in a given topic (Dringus & Ellis, 2010; Hew & Cheung, 2008). Evidence of knowledge-building based on message content and interaction between students or teachers and students is also a key theme (Schrire, 2006). Where studies into practice are concerned,

research has taken a qualitative turn. Recent studies have focussed on learner participation in discussions based on naturalistic, cross-case analysis (Dennen, 2005); and micro-analytic case analysis of student's individual approaches to learning tasks in a blended learning environment (Wise, Perera, Hsiao, Speer, & Marbouti, 2012). There is a growing acceptance that the dynamics of discussion boards requires more investigation, with recommended directions for future research including the need to 'clarify and take a more critical stance towards interaction between learners' (Hammond, 2005).

The social dynamics of self-organising online discussion groups and how students choose to become involved or how they decide to respond to online discussions remains under-explored in the literature (Beck, Fitzgerald & Pauksztat, 2003). It is notable too that very few studies on computer conferencing in educational settings have focussed on the social and physical context of the individual student and their learning environment or on how the technology within their learning environment shapes their experience. How this technology shapes interaction, how learners negotiate and engage with other learners during this interaction, and how such multi-site practices are adapted in an educationally worthwhile way is a significant pedagogic question (Fenwick & Edwards, 2010). This study sought to draw on well-established constructs about social interaction and diffusion of information to see how they might apply to a discussion forum in a blended-learning setting in higher education.

Structural Properties in Discussions

Structural interactions have normally been analysed in the context of a discussion performing the role of collective knowledge building, with student contributions falling into categories such as: (1) initiating; supporting; challenging; or summarising (Sorensen & Baylen, 2004); or (2) social; cognitive; teaching; and discourse-related (Hackman & Annabi, 2006). Emergent processes relating to the production of space through day-to-day student experiences, as suggested, remain less well-documented with the notable exception of Holley & Oliver (2010).

Models of group processes generalised into learning environments such as Tuckman's (1965) 'stages of group development' are difficult to reconcile with asynchronous discussion dynamics, even metaphorically. This is because of: (1) design factors – teachers may not provide for the socialisation stage of group development to their students; (2) choice – some students may choose to neglect or opt-out from the activity, or may simply decide to contribute the minimum amount to achieve their task without becoming engaged; and (3) the relatively fleeting nature of the learning community – for example 13 weeks in the case of a semester on a typical degree programme, and then only for a few hours each week. It is conceivable that in an asynchronous discussion, Tuckman's ubiquitous stages of 'forming' and 'storming' (Bonebright, 2010; Nicolopoulou, Koštomaj, & Campos, 2006) could be a natural rather than transitional state – the 'incoherent structures' as Thomas (2002) has it.

This is not to suggest that roles do not emerge – for example in the broader field of social networking software discussion interaction, structures around particular individuals in a network have been

clearly identified as: the 'answer person', the 'discussion person' and the 'discussion catalyst' Gleave, Welser, Lento and Smith (2009). Returning to the field of educational research, Beck et. al. (2003) suggest patterns do emerge showing core-periphery structures in which 'core members exchanged many messages with many different others, while periphery actors exchanged fewer messages with fewer others' (p. 319).

These dynamics are important – they impact on the learning experience. Sub-optimal participation may prevent students from developing 'robust and diverse peer networks ... an important influencing factor on student persistence and academic success' (MacFadyen & Dawson, 2010: p. 597). A student selecting the wrong alter¹ may be ignored (reducing satisfaction in the learning environment, or worse, reducing confidence). Further, if the aim is to 'de-centre' the teacher, teaching presence in the form of excessive comments can work against a primary intent such as student-student interaction (Mazzolini & Maddison, 2007).

Reciprocity, Homophily, Proximity: Clues to Interaction?

Reciprocity could be considered one of the 'defining features of social exchange' (Molm, 2010: p. 119). Helping others who help us has long been considered 'the norm of reciprocity' (Gouldner, 1960) and 'particular structures of reciprocity contribute to the creation of social capital in communities' (Molm, 2010: p. 129). It is perhaps not surprising then that 'analysis of interaction has emerged as a major theme within the current literature [in the wider field of] computer-supported collaborative learning' (Suthers, Dwyer, Medina & Vatrapu, 2010, p.5).

Exchange theory, extending the reciprocity construct, suggests that relationships are sustained on the basis of providing valued resources in anticipation of future returns, or in return for past acts of favour (Emerson, 1976). Certain aspects of this theory are useful for examining interaction in computer conferencing, including: (1) attempts to minimise risk and maximise reward (read: student deciding answers to 'post' or who to respond to in creating relationships), and (2) perceived fairness about how much time one is 'giving' to the activity including reading postings and responding to alters.

Behavioural observations in research about social exchange are also a potential line of enquiry – the idea of 'homophily' being relevant in the present case. Simply stated: 'individuals enjoy the comfort of interacting with those who are similar' (Rogers, 1995: p. 287). Further, electronic proximity is described in the literature (Zhao, 2003), but in a blended learning environment physical proximity is also relevant. Extending the idea of propinquity (Festinger, Schachter & Back, 1950) suggests that exchanges in online discussions might be produced as a consequence of frequent or close personal or electronic contact.

Study Design

The present study used mixed methods to examine the influences behind decisions made by students as they engaged in CMC choices following the contention that it would be useful to know 'reasons participants decided to send messages to certain other participants [to] clarify the importance of individual factors in [communication] choices' (Beck et. al. p. 321).

This was an Action Research project within the Faculty of Business and Finance at Holmesglen Institute in Melbourne. A total of 106 students were enrolled in a first-year degree study unit titled 'Business Communications', consisting of a two-hour lecture and a two-hour tutorial. There were seven tutorial groups, united for lectures. The learning management system (LMS) was Moodle, consisting of topic-organised course content and a variety of learning objects, links and online tests.

Four discussion forums were offered for students on a voluntary basis, with a 10 percent component of their final grade allocated for participation and content-quality (Rovai, 2007). Since this was an introductory course, some level of coaching in CMC was offered during tutorials, thus students did not contribute to discussion boards exclusively in their own time and personalised learning space. Importantly, the forums were provided as a self-organising activity for students within general guidelines provided by the instructor. Teaching presence was provided in face-to-face lecture and tutorial formats. Instructors generally abstained from forum involvement (apart from monitoring activity and shifting a small number of misplaced postings) meaning the content generated was almost exclusively student-student interaction. The design sequence followed general principles (Salmon, 2000; Northover, 2002) such as: (1) introductions; (2) generation of content; and (3) invitation to discuss and engage with others (including the opportunity to be a 'spectator' in other's discussions Northover, 2002).

The four forums were inserted as links in the course home page in Moodle in Weeks 2, 4, 6 and 8 and were open until the end of the Study Week prior to final exams after Week 14. Each forum was

formatted as a 'standard discussion in a blog-like format' (Moodle, 2012), so students could see the name of the author, their image or avatar (if they chose to upload either of these) and the first few lines of their post. Subscription mode was set to 'optional' for all forums. A significant feature of the student cohort was the level of diversity – with 50 percent of students being international from ten different countries of origin. Seventy percent of the students enrolled were female.

Students were initially surveyed about their reasons for selection of alter(s) in the asynchronous discussions. Semi-structured interviews were then carried out to follow up students of interest on a convenience sampling basis (Patton, 1990), using emergent results from the initial quantitative data gathering phase. As the study progressed, it became apparent that selection of alters who appeared 'knowledgeable' to their peers was a mediating factor in exchanges, and this influenced the interview sampling carried out later. The purpose of the interviews was to expand understanding beyond existing and perhaps more 'intuitively obvious' explanations for interaction (that is, exchange, reciprocity or propinquity). The interviews also provided the opportunity to explore and extend understanding of the day-to-day experience of the students as they went about their learning tasks to examine 'learning in the making' (Barab, Hay & Yamagata, 2009).

The data available from the LMS provided insights into system access and usage, although this was a by-product of the research process and not the main focus of this study. Metrics of interest included: the number of messages accessed by students; the number of messages posted; and thread depth. These metrics can provide a feel for the 'health' of the discussion (Dringus & Ellis,

2005). They also show the potential learning value provided to those who did not necessarily actively contribute, but rather chose to read messages ('lurkers'). This latter aspect is relevant in the present context, given the English as a second language (ESL) proportion of students. A summary of these metrics is shown in Table 1 with the purpose of each discussion forum indicated.

Survey Results

The survey was based on 22 items derived tentatively from constructs relating to interactivity (see reciprocity and so on above). A three point scale was offered with students asked to select an item or items they considered relevant to an encounter where they responded to another student's post in a forum. The scale within each category asked the student to rate the strength with which the relevant statement described their reason for responding to the post of the alter they had chosen from: 'most relevant'; 'quite relevant'; or 'possibly relevant'. Multiple categories could be selected to allow for the possibility of more than one reason for selecting a particular alter in a discussion. The scale design then allowed the strength of the 'reasoning' to be reported by the student. An open-ended response category was provided to enable collection of data that could be explored further at interview. Students were invited to complete surveys as soon as possible after making a posting with the provision of a link in the LMS giving direct access to a web-based survey. A total of 56 students responded to the survey, providing 151 completed surveys on their responses to 65 different alters.

The survey data is presented in Table 2. The response categories have been re-ordered from the original questionnaire into the table by the category with the highest frequency response and the

strongest reason category. While many of the popular response categories are consistent with the constructs proposed under exchange, reciprocity and propinquity theories, the tendency to select alters perceived as being 'knowledgeable' invites further examination.

In addition to the pre-coded response categories, several students provided additional comments about their selection of alters: *"I also like the idea of being able to help people develop further in the degree. Sharing knowledge can help broaden skills and perceptions"*; *"They didn't have any replies as yet"*; *"I was trying to satisfy the subject's requirements"* (twice); and *"I thought their post was great"*. The variety of responses that received a strong response from survey participants indicates the complexity and richness to the relationships developing in the course beyond a social learning process.

Additional data was explored to develop a better understanding of this perceived knowledgeable alter (PKA) response, including a review of those nominated in surveys as being 'knowledgeable', and the comparative data for the message 'views' by all students of these PKAs. Forum 2 (*Post and Discuss a Literature Review*) was selected for a more detailed analysis due to the relatively larger volume of transactions in that discussion. In this forum, 26 alters were suggested as being 'knowledgeable'. A selection of data for students nominated as knowledgeable (three or more times) and average 'views' across all other student posts in Forum 2 is shown in Table 3.

The data shows that these PKA's posts were more read and responded to than others in the forum. As noted in the final

Table 1 Some dimensions of the discussions under study

Items	Discussion Purpose			
	Introduce yourself and respond to a reading (on information literacy)	Post a literature review and discuss	A case study	Design an exam question
No. of discussions	117	113	94	61
No. of threads	171	313	240	203
Thread depth range (low-high)	0-11	0-13	0-11	0-26
Discussion item 'views'(1)	790	1,355	558	370 (2)
Average item views/student	7	12	5	3

Notes: (1) Based on LMS report data – duplicate 'views' removed from count; (2) This forum was used in conjunction with Google Docs so 'view' data is dispersed between two tools – only forum data shown; (3) Item 'view' data is diluted because forums allowed for subscription, allowing students to view posts via e-mail without logging into Moodle.

column of the table, their academic achievement was well above the mean on the course. Comparing the data above in Table 3 with the data in Table 1 indicates that the average number of message 'reads' for each student in Forum 2 was 12. In contrast, the minimum numbers of 'views' (column 3) for these PKAs was more than double this (the number of unique participants in this discussion was 103 students). The mechanism behind this variance is not clear. It is possible that the 'knowledgeable' student's posts were made earlier than other students, although the order of their posts suggests this is was not necessarily the case (see column four). Further, it should be noted that these students attracted an average of 8 threads to their initial posting – on the upper end of the range in that forum (see Table 1). The literature suggests forum posts attract attention based on reading habits (users tending to check their unread posts on login) with posts that have many unread threads getting more attention (Hewitt, 2011).

Given the blended nature of the learning environment, it is also possible that in-class influences have had a hand in this perception and response mechanism. Selection of alters who are perceived as knowledgeable is worthy of further examination. Student capacity to judge academic merit is noted in the literature (Falchikov & Goldfinch, 2000), and when viewed from the perspective of exchange theory, students selecting a knowledgeable other could perceive a future benefit from developing a learning relationship with them. Examination of this mechanism was pursued during the interviews and is described further below. Social network data was also collected to provide an understanding of the structure of discussions and to search for the patterns cited in earlier literature (Beck et. al., 2003).

Table 2 Survey – Responses to survey items and counts

Response	Relevance to selection of alter		
	Most	Quite	Possibly
I thought they were knowledgeable	60	26	8
they have already responded to one of my earlier postings	47	19	14
I already knew them	45	17	29
they could probably help me later	41	27	23
I sit near them in the tutorial	40	12	25
they are someone with whom I could build a useful relationship	39	14	21
I felt I could relate to them on a personal level	31	18	20
I can access them via other communications (e.g. telephone or instant message)	28	14	28
I know of them from other friends on this course	25	12	24
I sit near them in the lecture	25	17	27
they asked me to do so	25	10	6
we are friends	20	17	41
they seem like an influential member of the class	20	9	33
their post was one of the first ones I read/accessed	17	21	39
my response was part of an ongoing discussion I am having with this person	17	18	34
they are someone who I attended other classes with	14	19	45
they were someone whom I had already communicated with in the past (e.g. in class)	13	21	42
we are both in a similar stage of learning in our degrees	13	25	44
they are from the same culture as myself (for example ethnic or linguistic grouping)	12	9	32
I saw this as an opportunity to demonstrate my knowledge	9	20	55
I have noticed the answers they gave to other student's posting were knowledgeable	7	26	33
we are related	3	8	24

Social Network Data

Social network data was analysed using Ucinet (Borgatti, Everett, & Freeman, 2002) in order to identify patterns in communication. Several dimensions within this data were of interest. For example, did any of those suggested as being 'knowledgeable alters' have any particular position in the network structure? Previous studies have determined that students achieving better results in certain higher education courses tend to be in a network position as a 'hub' (Macfadyen & Dawson, 2010). The 'hub' in a social network tends to have more contact with other members of the network. In other forms of online communities, such as those suggested earlier, the so-called 'answer person' would also be identified as a 'hub'. Beck et. al. (2003) also noted the structure of student interactions as forming a core of students with many alters and a periphery who were in a sense on the edge of the group.

In Figure 1 below – at the individual discussion forum level (see forum #2 noted above), a sociogram was derived from the interaction. The PKAs detailed in Table 1 above were designated a special crossed-square symbol to distinguish them in Figure 1 below, and the tutorial group within which the PKA was a member was colour-coded (two PKAs were in the same tute denoted green). From Figure 1, it appears that the communication structure

Table 3 'Knowledgeable alters' and reading/responding patterns to their post in 'Forum 2'

Perceived 'knowledgeable' Alter (PKA)	No. of threads in the discussion	Number of views by others	Sequence of posting	Reported 'knowledgeable' by	Final grade (Course-wide - =62%)
Kerry	11	59	52 nd	4 others	88%
Linda	8	28	32 nd	3 others	78%
Jane	6	48	18 th	3 others	88%

of each tutorial group had two quite distinct patterns – one is clustered more closely (red) and the other is dispersed (green). Each PKA has begun assuming a position in the course-level network as a ‘star’ – recall that the forum is a course-wide activity rather than a tute-level one. This is not unexpected, since the average in-degree for the three PKAs is 7.3 – considerably higher for other forum participants who average 2.9. The literature suggests that in-degree is frequently considered a measure of prestige or popularity (Prell, 2012; Knoke & Yang, 2008). In a blended course, there is clearly the opportunity to develop social contacts and cohesion in face-to-face classes

At the course level, positioning of additional PKAs was reviewed, given the influence they appear to have had on their peer’s involvement in discussions. Further scrutiny of these alters was done by selecting those who: 1) were nominated as ‘knowledgeable’ by two or more survey respondents; and 2) selection of these alters for being ‘knowledgeable’ as the main reason their correspondent decided to post in the forum. Six students fitted this category and their position in the four discussions at the aggregated course-level is designated with red colour coding in Figure 2.

The sociogram at Figure 2 suggests the PKAs are positioned closer to the core of the social network structure – as derived from their forum posts – but not necessarily at the core. Again, the social network metric that is noteworthy in the data was that each of these six knowledgeable alters tended to have a higher in-degree than that of their peers – the average student on this particular network has an in-degree of 7.6, and the knowledgeable alters have an average in-degree of 10.7.

Interviews were conducted to explore the mechanisms behind the posting choices of alters made by students. A total of nine 30 minute semi-structured interviews were conducted with five of the PKAs and five of those reporting at least one alter as being a knowledgeable. The interviews sought general information about the student’s experience on the course, their experience in their forum interactions and some contextual information about their technology and online access behaviour, including the devices they used or appropriated in their interactions with the course material. The metrics for each student about how many ‘reads’ or ‘posts’ they made was also discussed.

A Review of Individual Student Activity and Interaction

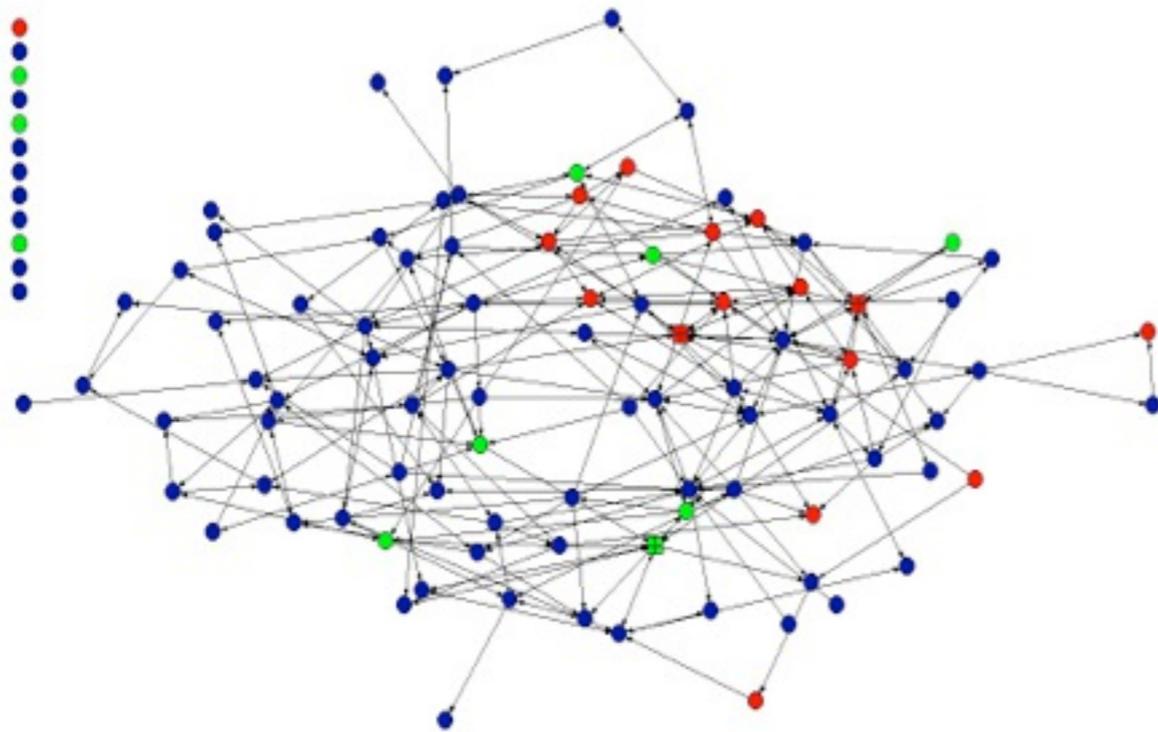
A series of portraits that characterise the nature of participation in the traditional teaching and learning activities and in the online forum is developed below. Interviews were conducted two months after course completion with the alumni in the two categories described above.

PKA Profile 1 – Jane

Jane is a local mature-aged student, who joined the course after a break from studies and having completed a Diploma qualification in business discipline some years ago. The introductory forum helped her to ‘meet’ students from other classes and she became more relaxed about joining the course as a ‘mature-aged’ student, with the forum showing the diversity of students who were undertaking their studies. Jane extended her acquaintance with other course members via the lecture and tutorial and forum posts – she felt a strong need to reciprocate when other students

responded to her postings. Jane was well-resourced, with access to the internet at home, a smart-'phone and a tablet device, and she used these to access course content on Moodle. She also used the college library facilities to access course materials and the forums. An analysis of Jane's forum posts suggests a 'dialogic' element (Knowlton's (2005) taxonomy) to her learning practice. Her posts

Figure 1 Sociogram of Discussion Forum Activity in Moodle – Forum 2 Only



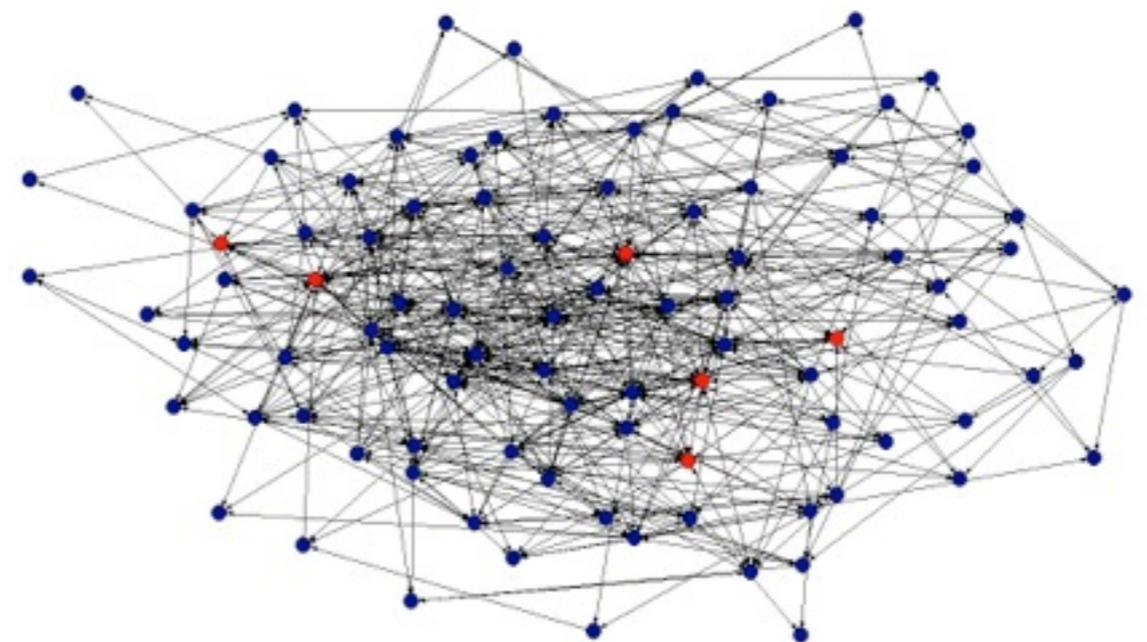
Notes: (1) nodes representing students on the left hand side of the diagram posted but received no replies. (2) the colour codes represent different tute groups, with the red group having two 'reported' PKAs, the green group one and the remaining four tute groups presented in blue (having no PKAs nominated out of this particular forum. (3) The figure represents the social network position across the course and within the tutorial groups of Kerry, Linda and Jane detailed in Table 3.

to other students were generally around 3-4 lines of text. They were carefully considered; polite; encouraging and at times made clear attempts to summarise the contribution of her alter in a concise way. Jane believed that because she had 'conceptualised' to a degree on her forum posts, that she might be considered knowledgeable. It might also be noted that Jane exhibited a high degree of 'citizenship' behaviour on the course.

PKA Profile 2 – Kevin

Kevin is an international student with an East-Asian background who at 18 is below the average age of the student cohort and is taking his studies with English as a second language. He considered himself a 'social' member of the class, having known a number of students from previous stages of the course undertaken in a previous semester. Kevin indicated that he tended to read the introductory posts of other students but he did not respond to very

Figure 2 Sociogram of Discussion Forum Activity in Moodle – Course Level



many. On the other hand, he had a strong belief that it is necessary to respond to other students who had replied to his own posts, considering it very impolite to ignore direct correspondence from other students. Kevin had good access to the internet via a computer at home, but did not use mobile technology to access course content, instead using the library facilities on campus to complete some tasks. His posting patterns were markedly different to Jane's. His posts varied widely in length from a couple of lines to more extended posts that included a combination of quotes from a journal article; asking questions; or requesting further information. Kevin's posts also contained positive sentiments to other students. Involvement in the forum activity helped him to build relationships based on new and existing student contacts on the course.

PKA Profile 3 – Linda

Linda is an international student who is also learning in English as a second language and is 20 years of age. When she went through the forum posts she evaluated the comments made by students to decide if they were simply offering an opinion or if there was a more sound basis on which the contribution was made – for example by referring to a reading or the text. She did not aim to be a 'top' contributor, but felt that it was important to maintain a 'business-like' style and tone in her contributions, which she typed and edited directly online rather than through a word processor. Linda had good access to the internet at home and used her own computer to help with contributing to discussions. Linda also used a smart 'phone and tablet device to read the forums on which she was subscribed, rather than contribute. She felt that she was responsive to other students and would return correspondence

within a week – she had developed this 'habit' from her working life where large volumes of email were common. LMS data indicates that Linda was on the lower end of the scale for 'reads', but on the upper end of the scale for 'posts' in the forum.

Student 'Reporting' PKA Profile 1 – Dana

Dana is a local student who entered the course from the vocational college in order to further her education and gain a business degree. At 21, she is close to the average age of the other students on the course, and achieved a Credit result. Although she has good access to technology, with the internet at home and mobile devices available, Dana is a time-poor student who works 3-4 days per week. She felt tentative about getting involved in the forums at first, being concerned that there was a risk of projecting a lack of knowledge to her peers. She later felt more confident and eventually came to value exchanging views with other students through the forums offered. Dana's perception of another student as being knowledgeable was based on her observation that they exhibited certain life-experience, demonstrated in the text of their postings. She also knew of some students who were 'studiers' which helped her form an opinion about their status independently of their contribution to the discussion forum. Dana's observation was that these particular 'knowledgeable' students tended to link their answers to the subject text, or made the relationship between the questions or activities in the forum and what was to be learned (course content) readily apparent.

Student 'Reporting' PKA Profile 2 – Mara

Mara is a local student who had completed a diploma at another campus before joining the degree programme. She needed to balance study and family time and found the forum useful because

it allowed her to get to know a good number of students that she had never met. She used a smart 'phone and a computer at home to access the course materials. Mara was a member of one of the larger tutorial groups (20+). She tended to keep to herself during tutorials and she reported being 'quite selective' about with whom she corresponded on certain forums, especially in the case study forum. She suggested that her selection of a 'knowledgeable alter' was based on those who she felt were more perceptive – judged by the contents of their posting on the forum – or after a careful analysis of the quality of the text within the posting.

Student 'Reporting' PKA Profile 3 – Sarah

Sarah is on the upper end of the age range of students on the course. She has returned to study to extend her knowledge and started her career in another non-business discipline. Sarah was in the larger tutorial group and felt that she shared certain views with another member of the class through particular life experiences. She is a cautious user of technology – she has home internet access but is not a regular user of mobile devices – Sarah took a 'pragmatic' approach to the online forums. When she did access them, she went through other student's posts methodically – this is reflected in the total number of 'reads' data reported through the LMS. Sarah looked at the way other students expressed themselves, seeking those who had a more 'serious' or 'mature' contribution which had an important point to make and that stood out as 'making sense'. In evaluating and responding to forum activities, she considered whether another student's contribution was original and included a personal point of view, or was simply a re-iteration of another point made elsewhere in course material.

Conclusion

This study brings together aspects of the social structure of self-organising discussion forums in a blended learning environment and extends the understanding of practices with a closer examination on a case-by-case basis. The unique assemblage of multiple learning sites and technologies and the responses elicited by different individuals provides an exemplar of learning-in-the-making.

Some observations can be made about the reported 'knowledgeable alter' response mechanism from this study. There is a variety of mechanisms at work in the blended learning environment, including: (1) direct observation of the other student's behaviour in tutorials such as responding to or asking tutors questions; (2) prior knowledge of the student as being 'conscientious' for example doing weekly 'set' readings; (3) careful reading of other student's posts to determine if they were giving 'templated' answers or conversely that they demonstrated a level of critical thinking; (4) that the alter seemed older or more experienced, giving them some level of credibility with the observer; (5) those who provided responses to questions in the forum with good explanations, backed with a link to the course content; and (6) those whose post made a point from their own personal perspective rather than a reiteration of course content. Exploration of the practice of PKAs suggested that: (1) these particular students were more selective about the posts that they chose to read fully (recall the forum mode set for this course was in a blog-like format); and (2) that they tended to put more effort into the structure, length and content of their posts.

Extending the proof of concept in the use of sociograms drawn from course discussions to detect at-risk students early (MacFadyen & Dawson, 2010) could be useful to identify those students in a position to encourage and assist others in the forum activity (helping them to build 'robust and diverse peer networks' p.597). By identifying those forming part of the social hub – perhaps then qualifying this by examining the quality of postings – it may be possible to develop an intervention that involves students in a position to help others by either encouraging them or engaging with them in the forum using partnering or a similar approach. The concept of 'partnering' other members of an online learning community to increase a feeling of inclusion is also supported elsewhere in the literature (Fasso, 2010). In a blended environment, partnering could have face-to-face and online components. Further research is needed to determine if the use of sociograms can help identify these students early as it did for identifying students at risk in MacFadyen and Dawson's (2010) study.

There is also a case for provision of detailed discussion exemplars to be available for students entering a forum activity. The ones provided to students on the course under study were based on smaller vignettes adapted from Hew & Cheung (2008). It may be that to guide those students with less confidence, a more developed case-study exemplar could be included in the subject outline or on the LMS. This would further assist those students who are unclear about the structure or the process of the activity. This approach would give them more ideas about effective participation on a discussion forum, with the view that better posting quality leads to more correspondence, leading to increased confidence and participation – a 'virtuous cycle'.

Further research is required to examine detailed practices in the use of learning materials, technology, and student-student interaction in a blended learning environment. This may assist in identifying more timely ways in which diagnosis and intervention can be implemented that will enhance the student experience in online discussions. The number of studies indicating that online discussions provide solid educational and diagnostic material is now growing and will be enhanced with additional examination 'beyond simple measures of behavioural quantity' – a call made by other researchers (Wise et. al., 2012, p. 115). Still, gaps in the understanding of the learning affordances offered by online discussions remain. Further research into how the technology itself shapes interaction is warranted. Exploration of teaching and learning practices that best harness the design features of these systems is also needed. This suggests that further micro-level analysis is a consideration for the design of future studies.

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Biography

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For ICT's sake

Secondary teachers' views on technology as a tool for teaching and learning

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Abstract

This paper reports on a study that sought to explore the pedagogical reasoning behind the use of ICT in secondary teachers' classes. In particular, it explored the question of whether their use of ICT was driven by pedagogical ideals for meaningful learning or whether they were using technology for other purposes. Eighteen teachers from two Australian regional secondary schools were asked how they currently use and integrate ICT into their regular curriculum practices and their reasons for so doing. This paper specifically takes an evaluative look at the pedagogical reasons behind teachers' attitudes, views and reasons for using ICT as a learning vehicle. The study revealed that ICT was largely being used for ICT's sake rather than for any convincing or meaningful pedagogical purpose.

Literature and Theoretical framework

Since ICT (Information and Communication Technology) has been introduced into the classroom, it has been claimed that it has a positive impact on student learning. In the research literature, ICT has frequently been reported as a tool that provides opportunities that transform learning (Selinger, 1998); build knowledge and thinking skills in learners (McFarlane, 1997), and alters the traditional balance between teacher and learner. Zhao et al. (2002) reported that teachers' use of ICT therefore hinged on understanding the affordances and constraints of the technology being used with a greater emphasis on the technical skills (as well as support from the human infrastructure) rather than the pedagogical aspects.

The individual teacher is the important starting point in understanding change within the use of ICT in schools (Donnelly, McGarr & O'Reilly, 2011). Adding to this, Garcia-Valcarcel (2010) pointed out that ICT has not become fully accepted into the classroom and remains as an under-utilised resource in the teaching process even though, in many schools, the resources are reasonably readily available. She suggested that teachers needed a range of professional support however she did not adequately describe how ICT contributes to the learning process. While teachers can show commitment to ICT, they do not seem to recognise the value of it beyond the extent that it can be used to motivate students (Wikan and Molster, 2011). Wikan and Molster claimed that teachers' use of ICT often reflects the outside expectations placed on teachers to use ICT (for ICT's sake), rather than how it might contribute to student understanding. In fact, much ICT research centres on the use of the resources rather than focusing on the pedagogical use of ICT as a learning tool, or how it supplements existing mainstream teaching approaches.

Some researchers (Girvan & Savage, 2010) have explored which pedagogical approaches are more appropriate for use with ICT. This approach could have similar outcomes to aligning student learning styles to teaching approaches. The research into ICT use has parallels to earlier learning styles research and comparatively little research into appropriate pedagogical frameworks. Savin-Baden (2008) agrees that much ICT use lacks adequate pedagogical frameworks. This apparent lack of pedagogical frameworks is reflected in Webb and Cox's (2004) review of ICT-related pedagogy that suggests its adoption depends on teachers' values and beliefs and that this is influenced by the teachers' pedagogical content knowledge (PCK). Chen (2010) stated that pre-service teachers' self-efficacy of teaching with technology strongly influenced their use of ICT which in turn was mediated by their perceived value of ICT use.

Schibeci et al. (2011) reported on a study that investigated learning opportunities presented by ICT and the effect on teachers' pedagogy. They reported that once teachers have adequate experience and confidence in three areas, namely, "Approaches to Teaching and Curriculum Development", "ICT Use and Competency", and "Classroom Dynamics", teachers have the ability to deliver effective lessons. While these researchers recognised context as an important factor in teacher professional development and that teachers needed to retain control over their professional development, it is still a step-wise process which is analogous to conceptual change theory but does not recognise the fluidity of classroom learning as outlined by second generation, cognitive change scientists (Klein, 2006; Schwartz & Heiser, 2006; Wickmann, 2006) who view learning as an 'expressive' situated nature of cognition.

Recently, there has been an interest in Technological Pedagogical Content Knowledge (TPACK) (Harris & Hofer, 2011). They found that teachers' use and selection of learning activities and technologies changed by becoming more student centered on intellectual pedagogies rather than engagement pedagogies and more selective in the use of technology. Mouza (2011) investigate how professional development influenced teachers use of technology, content and pedagogy. She claimed that professional development increased their ability to connect technology with pedagogy and content but was not clear why pedagogical choices were made about their use of technology in the teaching process.

Research has described aspects of teaching that relate to effective learning and student outcomes (Hattie, 2009). Effective teaching needs to involve the teachers' background, beliefs and attitudes and also the students, classroom and the school. Teachers' beliefs about the nature of teaching and learning tend to range between transmissive and constructivist beliefs (Rogers, 2003). The transmissive view sees the teacher as the holder of knowledge and controls the learning process while the constructivist view implies that students play an active role in the learning with a resultant emphasis that stresses the development of thinking and reasoning processes (Staub & Stern, 2002). While different views about where to put the emphasis in classrooms will not affect the validity of the very general principles asserted, they will affect the balance of activities and strategies recommended for the exemplary classroom. The teachers' view of the learning process should deliberately affect how they utilize ICT in their teaching and learning practices.

In Victoria, Australia, the use of technology in teaching and learning is strongly encouraged for years 7-10 (VCAA, 2012). How teachers evaluate the effectiveness of the use of technology in

promoting teaching and learning is a largely unanswered question. Wiliam (2011) stated that for learning to occur, there is a need for greater focus on the learning process and context. There is a comparative silence about what is a theory of learning within ICT and how teachers' beliefs and values impact on how they view learning and use ICT in their practice. In addition, how to assess the impact of ICT on the learning process is also an unanswered question. So, it is important to examine how teachers perceive that they will assess this effect.

Research Design and Data Analysis

In this research, 18 teachers from two regional schools in Victoria, Australia, participated in the study. In framing an appropriate research design for this study, it was considered that an ethnographic methodology, situated within a qualitative paradigm, was the best approach. While a pre-interview survey captured a list of the technologies the participants claimed to use, the majority of the data around the reasons for their use was largely collected from individual teacher-researcher interviews. The research literature has demonstrated that in an interview situation teachers usually provide narrative accounts when answering research questions (Clandinin & Connelly, 2000; Conle, 2003). These narratives offer rich and deep insight behind their practice than some other forms of data collection and thus enriches the data being collected.

In undertaking the research, initially all participants were presented with an individual pre-interview survey. This survey introduced the study and its purpose and defined technologies that might constitute ICT. The survey asked teachers to reflect on the particular and various forms of ICT that they had used in their classroom practice in the last six months and to list them in a table. This table then formed the basis for further exploration of the

teachers' reasoning and pedagogical views behind the use of the particular ICT tool in the subsequent interview.

From the survey responses, a list of all the forms of ICT the participants' claimed that they had used in the last six months was compiled and grouped into major categories (Table 1). To further provide more detail to the analyses of the data, the forms of ICT claimed by each individual participant, their subject areas, years of teaching experience, and gender were examined.

In the individual, open-interviews, participants were asked to consider how they saw ICT assisting in the process of teaching and learning. Why did they use the particular forms of ICT they claimed they used in their practice? What were the benefits/advantages or disadvantages that ICT have to offer? What were the reasons behind its use? Were these linked to student learning? For pedagogical reasons? What teaching approaches did it support?

These interviews were then transcribed and carefully analysed. Responses across all the participants were categorised and tabled under the main research questions (as above), and, as an emerging theme or category became apparent, this was also appended to this developing table. This procedure yielded a large data set from which similar, interesting and varied views were able to be drawn out and summarised.

Results and Discussion

From the data collected through the survey, Table 1, reveals that the access, use and uptake of ICT from the 18 participants across the two regional schools was extensive and wide-ranging with over 40 various forms of ICT being claimed. There appears to be generally no significant difference between the forms of ICT being used across subject areas (except in the case of content-specific

computer programs), between teachers with different years of teaching experiences, between the age of the teachers and the uptake of the technology, or between the two schools. However, there were apparent individual differences, most markedly evident between two participants teaching the same subject at the same school. Shane, an English teacher, listed few ICT forms while Grace, also an English teacher at the same school, offered a very extensive list. While the data suggests a lack of correlation generally, the forms of ICT claimed to be used has been shown to be very individualistic. It becomes important then to find out the individual teacher's reasons, motivations and preferences behind their use.

The data set that emerged from the participants' individual interviews provided answers to these questions. Participants' responses had been grouped according to the research questions asked in the interview and any emerging themes. Presented here is a summation of these data with indicative responses provided where appropriate.

The participants who heavily utilised technology in their classroom (Grace, Sarah, Margaret and Belinda) generally felt that it allowed their teaching to be tailored for various paces, levels, ease of access to information and spontaneous learning opportunities.

For some of the participants (Kay, Shane, Mary, Helen), although they used technology in their practice, they were more attracted to traditional learning approaches and were concerned that some skills (such as hand writing) would be lost to the detriment of the students. These participants claimed that ICT was often used for ICT's sake rather than for quality learning, and should not be seen as a replacement for "doing the teaching".

Specific reasons for using particular forms of ICT were wide ranging and were unanimously viewed by all participants, to be the benefits or advantages of using the particular forms of ICT claimed. Reasons included that ICT:

- fostered student-centred learning;
- aided student organisation;
- enabled innovative teaching;
- was taught only for ICT's sake -
"I'd be perfectly honest and say that we are expected to put some ICT into our courses" (Mary);
- fostered student engagement:
 - through visual stimulus;
 - because of its interactivity;
 - because it dressed up educational software as a game;
 - because it was a novel "gadget" (Mary);
- was a fast research tool;
- allowed easy manipulation of content;
- could demonstrate complex models (i.e., in conceptualising the atom in 3D in science);
- offered experiences which are otherwise impossible or unavailable;
- relevant to ICT in everyday life and the reality of its uptake in society:
 - that it is today's students' preference for learning –
"Clearly it's the way they prefer to learn" (Grace);
- fostered a sense of student community with the wider community in regional schools through online networking and collaboration.

Many of the participants (n=16) felt that their reasons for using (apart from using ICT for ICT's sake) were pedagogically sound. This was clear from their explanations about how and why they used a particular technology. Surprisingly, very few participants

(Belinda and Faye) made consistent, clear pedagogical links between their ICT use and their teaching, their students' learning and the content being taught. For example, Faye believed that her use of ICT developed higher-order thinking skills in her students:

"Part of my job is actually about ... trying to change how we think and change the level of thinking and use more higher-order thinking for our students or get them doing more higher order thinking using ICT. ... It's a big change of philosophy" (Faye).

Belinda was wary of being more than just a facilitator in her classroom. Although she felt she was a facilitator of learning, she was not just a facilitator for the technology being used. She saw her clear role to direct and facilitate the learning but not to allow the technology to do the learning for them. She stated:

"My view is that you shouldn't use ICT as the teacher. That the teacher is central. ... And so you realise when you're using ICT that your teaching still has to be explicit. ... You still have to provide all of the steps and you still have to provide that one on one instruction. You can't just go well, you watch this slide show or presentation that I've saved on the computer – it tells you what to do then you do it. You know, you can't just have the technology teach for you, you still need the teacher in the room" (Belinda).

All others struggled to make a convincing argument that for some or all of their reasons, that any actual link existed at all. For example:

"We don't have to spoon feed them anymore. I think it [the internet] teaches kids to be more resourceful and find out information and that skill can be carried across to anything in life" (Kay).

Table 1 ICT forms claimed to be used by participants

Major category	Minor category	ICT forms claimed to be used by participants
Programs/soft-ware	Microsoft Office programs	<ul style="list-style-type: none"> • PowerPoint • Word • Excel <ul style="list-style-type: none"> • Access • Publisher
	Educational	<ul style="list-style-type: none"> • Classtools.net (creates free educational games, quizzes, activities for online hosting) • Spellodrome (an interactive program for enhancing students' spelling and literacy skills) • Interactive games (general) • Interactive math programs (general) • Maths300 (online resource for lesson ideas for teachers) • Mathletics (an interactive program for enhancing students' mathematical skills)
	Graphics editing	<ul style="list-style-type: none"> • Photoshop (Adobe) (A graphics editing program) • Illustrator (Adobe) (A vector graphics editing program) • Paint (Microsoft). (A drawing program used to create simple drawings). • Google SketchUp (a 3D modelling program) • GIF animator (online or downloadable program for creating animated GIF images). • Flash (Adobe) (A multimedia platform for creating animations for using on computers and other electronic devices)
	Video/audio editing	<ul style="list-style-type: none"> • Windows MovieMaker (Microsoft) (a video creating/editing software) • Premier Elements (Adobe) (a video creating/editing software) • Final Cut Pro (Apple) (a video creating/editing software) • Audacity (a program for recording/editing audio) • Photo Story (Microsoft) (Allows users to create a visual story from digital photos). • Animoto (A web application that produces a video from photos, video and music). • Podcasts (a series of audio/video files subscribed to and downloaded from the internet) • Cartoon Story Maker (A software program for creating 2D screen based cartoon stories to illustrate conversations and dialogues)
	Web-authoring	<ul style="list-style-type: none"> • Dreamweaver (Adobe). (Web authoring and editing software).
	Presentation software	<ul style="list-style-type: none"> • Prezi (a cloud-based presentation software)
	Other	<ul style="list-style-type: none"> • OneNote (Microsoft) (A program for free-form information gathering and sharing) • Geographic mapping programs (general) • Hot Potatoes (a freeware program for creating interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises for the internet)
Intranet	<ul style="list-style-type: none"> • Moodle (software for producing internet-based courses and websites) • Clickview (a video delivery platform that provides pre-recorded educational television programs to teachers' computers or data projectors) 	
Websites	<ul style="list-style-type: none"> • Websites (general) • E-learning interactive websites (general) • Google • YouTube <ul style="list-style-type: none"> • Social networking websites: <ul style="list-style-type: none"> ○ Facebook ○ Myspace • Wikipedia 	
Online applications	<ul style="list-style-type: none"> • Email • Hyperlinks (hyperlinks to general websites) • Blogs (personal journals published on the internet) • Wikis (simple webpages that groups can edit together) • Interactive games (general) • Online testing applications 	
Other communication applications	<ul style="list-style-type: none"> • SMS (Short Message Service, also known as "texting" is a text messaging service from communication devices, such as phone, web and mobile devices) 	
ICT Infrastructure and/or hardware	<ul style="list-style-type: none"> • Interactive whiteboard • Classroom computers • Student laptops • Data projector • iPods <ul style="list-style-type: none"> • Digital Camera • DVDs • Videos and video clips • Webcams • Hand-held voice recorders 	

This comment shows that this teacher's belief is that the technology can do the teaching for them. So, if this is the limit of Kay's involvement in her students' learning then pedagogically it is flawed. It is no longer a pedagogical technique but a way of removing herself from the pedagogical process all together. In fact, Kay later stated that her view of ICT being embedded in schools was because

"I just think we live with a group of kids that are constantly plugged into some form or another of you know, media. So that to really tap into what engages them, that it is really useful" (Kay).

For Grace, Kevin and also Kay, their reasoning behind some of their ICT use was that it was simply "engaging" for students. While this could be linked as a motivating factor for pedagogically sound ICT activities, they could give no further rationale beyond the fact.

When asked to describe some of the difficulties/disadvantages or frustrations around using particular forms of ICT, the following responses were provided:

- infrastructure was under resourced;
- technical support not available through the school day;
- monitoring student off-task behaviour was problematic;
- encourages lazy behaviour / automates thinking / students rushing;
- issues in authenticating student work as their own:
"Some kids I think let the computer do the thinking for them ... An easy out" (Mary);
- cannot replace all forms of learning (i.e., practicals in science);
- students believing everything on the internet as absolute truth.

For most of the participants (n=16), the last of the five points above were commonly eluded to in the interview. This may seem a surprising finding because while these participants mostly were unable to articulate sound pedagogical reasoning behind their use of technology, they were able to readily point out its deficiencies. This effect may be related to the teachers' negative attitudes on ICT use in teaching and learning itself. If these teachers are not using ICT for valid pedagogical reasons, then their use of ICT may be as a means of "doing the teaching" for them. In this way, the technology actually betrays them – it leads to a lack of student engagement, encourages off-task behaviour and does indeed create an "easy out" for students. So, it is therefore not surprising that these teachers would be more aware of the disadvantages of the technology being used as they would be more commonly exposed to these challenges.

All participants agreed that good learning habits in students could be promoted through ICT use but all but one participant (Faye) could provide sound examples or explanations. Faye, throughout her responses, indicated a few good learning habits which can be encouraged through ICT, such as it "creates some fantastic organisational habits" (Faye) for students, and most importantly, it gives the student ownership, independence and a sense of autonomy in their own learning:

"One of the things that it [ICT] can really do is work out who is responsible for their learning. And I think that's a big changing in thinking and philosophy. ... They [students] can turn around and realise this is actually [their] job. Not somebody else's job to make [them] do this. This is [their] job to take responsibility. ... It becomes more independent and it becomes their role. So then the teachers are there ... as a guide, as a facilitator rather than as a driver" (Faye).

A couple of participants (Kevin, Alka, Stuart) offered a caveat though that “good learning habits are supported by whatever tools you are using to learn something with” (Kevin) not just necessarily ICT forms. All participants also claimed that technology offered support in individualising the curriculum because it allowed students to travel at their own pace or be completing different activities in the same classroom at the same time as other students. All of the participants claimed that they used “student engagement levels” when asked “What do teachers look for to show that ICT is having an impact on student learning?” Aside from this ad-hoc method, there was seemingly no other ideas offered. Both Faye and Belinda, however, were able to present adequate explanations that included how they used ICT in valid assessment of their students’ learning.

Conclusion

Findings from the study revealed that teachers have varying views on how ICT should be used in the classroom. In the study, all teachers used a variety of ICT forms and that the two schools expected them to use technology in their teaching. Most participants claimed that its use formed or was part of an effective strategy or approach for teaching and learning. In reality, the responses from the participants revealed that nearly all of them (n=16) could not provide convincing pedagogical arguments behind its use. Only two participants could consistently offer sound pedagogical reasoning for their choice and implementation of ICT in their practice.

The way teachers used ICT therefore seemed to be impacted by how they viewed the teaching and learning process. For the teachers who heavily used ICT forms in their daily lessons, they believed that ICT offered a more amenable and engaging tool that facilitated learning. These teachers felt that ICT allowed their

teaching to be tailored for various paces, ease of access to information, and spontaneous learning opportunities, among others.

Other teachers had a different approach, recognizing that other non-ICT forms of teaching were important. Although, these teachers felt that ICT had its place in the curriculum, they were concerned that students were also being left-behind if traditional teaching/learning approaches were abandoned. These teachers in particular looked at the quality of the ICT being used and the ability to adequately assess students’ learning through ICT. Other teachers viewed ICT as replacing or “doing the teaching” and that their role was simply being a director of learning. Perhaps, the most significant finding in this study was the linking between teachers’ negative attitudes to ICT and teaching and learning – those who could not articulate sound pedagogical reasoning behind their use of ICT were also the ones most likely to offer disadvantages and deficiencies around its use. In many ways, this is akin to intended failure, where poor pedagogy leads to poor use of ICT which leads to poor student engagement, which leads to teacher frustration and so on.

Although the use of technology is an accepted part of school culture in Victoria, and is encouraged through curriculum documents, it seems the focus for teachers is still on functional opportunities afforded through efficient computation (such as accessing fast data from the internet) rather than the impact of developing robust student understanding. That is, its use does not reflect a strong pedagogical framework.

Dominating the research literature on ICT in education, is the focus on the technologies themselves – on their use, their uptake within classrooms, what they can offer in regard to learning outcomes,

technical competencies, and so forth. While this is worthwhile, there appears to be a relative vagueness when it comes to linking ICT with the teaching and learning process. This study is one attempt at addressing this important link.

As we learn more about the complexities involved in teaching and learning, and understand that the teachers' involvement is crucial in that process, it is imperative that we begin to explore teachers' views of ICT, their beliefs and values, how they use it in their practice, their reasons for so doing and how they might link this purposefully (or otherwise) to the teaching and learning process. This study brings the teacher into the spotlight and acknowledges their essential role to the process, and might contribute to the development of a pedagogy for ICT education, in what will inevitably be regularly embedded as part of the normative learning processes in the future of schooling.

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Biography

Adam Bertram is a lecturer in the Faculty of Education, Monash University. He worked for eight years as a secondary teacher. His PhD explored how teachers' pedagogical content knowledge (PCK) could be developed and recognised. This led Adam to become interested in teacher education and teacher development research. For his work on PCK, he has been invited to present and conduct workshops with teachers nationally and internationally. One of Adam's current interests is in exploring the relationship between teachers' pedagogy and their use of ICT in their practice.

Bruce Waldrip is an Associate Professor at Monash University. Bruce is interested in how students learn and particularly as to how reasoning assists learning. He is the recipient of nine ARC grants into learning.



Something's coming, something good

Identifying TPACK competence in pre-service teachers' analyses of learning objects

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Abstract

There is a song at the beginning of the musical, *West Side Story*, where the character Tony sings that "something's coming, something good." The song is an anthem of optimism, brimming with promise. This paper is about the long-held promise of information and communication technology (ICT) to transform teaching and learning, to modernise the learning environment of the classroom, and to create a new digital pedagogy. But much of our experience to date in the schooling sector tells more of resistance and reaction than revolution, of more of the same but with a computer in the corner and of ICT activities as unwelcome time-fillers/time-wasters. Recently, a group of pre-service teachers in a postgraduate primary education degree in an Australian university were introduced to learning objects in an ICT immersion program. Their analyses and related responses, as recorded in online journals, have here been interpreted in terms of TPACK (Technological Pedagogical and Content Knowledge). Against contemporary observation, these pre-service teachers generally displayed high levels of competence and highly positive dispositions to the integration of ICT in their future classrooms. In short, they displayed the same optimism and confidence as the fictional "Tony" in believing that something good was coming.

Introduction

It has long been held that information and communication technology (ICT) would be the catalyst to transform education (DFEE, 1997; MCEETYA, 2006; UNESCO, 2008). But it appears evident that such transformation – or what has been called “previously unimaginable opportunities for conceptual understanding” (UNESCO, 2008, p. 1) – has been slow in coming and the source of ongoing negative critique (see, for example, Cuban, 1986, 2001; Oppenheimer, 2003).

A recent experience at a large Australian university has proven contrary to negative commentary and to findings of low ICT competence and confidence in similar studies of pre-service teachers (see, for example, Albion, 2003; Jamieson-Proctor, Finger & Albion, 2010). Pre-service teachers (N=43) at a large metropolitan university in Australia were asked to respond to simple questions relating to their understandings and experience of ICT in the classroom and to explicitly link ICT products, specifically learning objects, to curriculum goals. The findings in this study, albeit of small-scale and localised to one institution, has given some cause for optimism that perhaps “something good” – as in the opening song from West Side Story – is coming.

The promise of ICT in teaching and learning

Something’s coming. Along with many others, I have been waiting for something “great” to happen with the implementation of information and communication technologies (ICT) in classrooms, to start to see a broad diffusion of the potential currently and atomistically noted in individual classrooms. But, to my joy, as the well-known song lyrics from West Side Story

(Bernstein & Sondheim, 1957) offer, “the air is humming: And something great is coming!” This paper will outline the positive perceptions and experiences of one group of pre-service teachers, particularly in their analyses of learning objects, which rekindled my optimism for the future. Something’s coming, something good. The shift from the peripheral to the mainstream is in reach.

TPACK – Technological pedagogical and content knowledge

This shift can be conceptually framed within the influential concept of TPACK (Technological Pedagogical Content Knowledge) (Koehler & Mishra, 2008; Mishra & Koehler, 2006). TPACK attempts to move a long-held understanding of teacher practice, that is Pedagogical Content Knowledge (PCK), into the 21st Century context of the technology-rich classroom. Of particular interest in this paper is one of its components, Technological Pedagogical Knowledge (TPK). This, put simply, is where technology is integral to a learning outcome and where teachers make informed decisions about which technology to use in given situations. This is grounded in the notion, consonant with extant policy statements, that:

... technologies afford us the ability to convey concepts in new ways that would otherwise not be possible, efficient, or effective, with other instructional methods. In other words, these technologies don’t just help us teach the old stuff in new ways – they can also help us teach new stuff in new ways.

(Klopfer, Pesterwell, Groff, & Haas, 2009, p. 4)

Mishra and Koehler (2006) described technological pedagogical knowledge as being:

... [the] knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies. This might include an understanding that a range of tools exists for a particular task, the ability to choose a tool based on its fitness, strategies for using the tool's affordances, and knowledge of pedagogical strategies and the ability to apply those strategies for use of technologies. (p. 1028)

An example of fitting technologies to pedagogical strategies is in educational use of blogs. Richardson (2006) argued that, in this context, blogs:

- can promote critical and analytical thinking.
- can promote creative, intuitive and associational thinking (through brainstorming and commenting on ideas).
- can promote analogical thinking.
- can increase access and exposure to quality information.
- provides a combination of solitary and social interaction.

A call to change teaching practice to take advantage of the affordances of ICT in learning has been a familiar refrain in the literature over the past three decades. More recently, Hedburg (2006) declared that:

We now need to choose pedagogical options that introduce more "transcending," that create learning environments in which learners experience views of the world that are multimodal and that require a

range of literacies not only to understand the different representative descriptions but also to employ tools with which learners can construct their ideas and communicate them to others. (p. 8)

Multimedia/Multimodal learning

The specific ICT considered in this study is multimedia, here in the form of a self-selected learning object from the Australian Le@rning Federation repository [<http://tlf.edu.au>]. The selection was deliberate and was partly informed by the observation by Jamieson-Proctor, Finger and Albion (2010) and pointing specifically to the Le@rning Federation established in 2001, that the pre-service teachers in their study had not expressed "a high level of competence ... for any of the Web evolved in the past few years, as well as digital learning object repositories" (p. 10). It should be noted that the Le@rning Federation closed in June 2013, to be replaced by Scootle, an expanded service for educators [<http://www.scootle.edu.au>].

Given this selection for study, it is important to consider the presumed affordances of multimedia in learning. Learning with rather than from multimedia has been regarded as being "among the most complete and engaging of constructivist/constructionist activities" (Jonassen, Myers & McKillop, 1996, p. 94). Learning from multimedia has, more recently, come to be known as multimodal learning which has, in turn, been described as referring to:

... an embodied learning situation which engages multiple sensory systems and action systems of the learner. This type of learning is traditionally emphasized for children with learning challenges, and can include a variety of visual inputs in addition to text. Some

examples include pictures, art, film, video, and graphic organizers. Auditory inputs can include text-to-speech synthesizers, various forms of singing and musical instruments, rhyming, and spoken language games.

(Massaro, 2012, p. 1)

Further to this, Sankey, Birch and Gardiner (2010) offered that:

The increasing use of multimedia in teaching has provided many opportunities to present multiple representations of content (text, video, audio, images, interactive elements) to cater more effectively to the different learning styles and modal preferences of an increasingly diverse student body. (p. 853)

The effectiveness of multimedia or multimodal learning has been established for some time. The “modality effect” – particularly when audio replaces text – has shown to have significant impact on retention, transfer and matching (see, for example, Moreno & Mayer, 1999).

Documenting ICTE pedagogy

A motivation for the set tasks completed by the pre-service teachers in this study, including that selected for analysis in this paper, was to provide the opportunity for them to fulfil the criteria of the Smart Classrooms Professional Development Framework (DETA, n.d.). The state education system in Queensland (Australia) has developed a framework with three levels of ICT accreditation for teachers: ICT Certificate, ICT Pedagogical Licence and ICT Pedagogical Licence (Advanced). Students enrolled in selected teacher education programs in the state were, until recently, able to qualify for equivalence to the base – or entry – Certificate level through the criteria for the ICT Certificate

(presented in full in Table 1). It includes core skills, knowledge and abilities as well as ICT in a pedagogical context. Its emphasis, although implicit, is on the technological pedagogical content knowledge (TPACK) described previously in this paper.

Table 1 Smart Classrooms ICT Certificate Criteria (Department of Education and Training (DETA), n.d)

Dimension	Criteria
Professional Knowledge	I understand that ICT can be used to benefit teaching and learning and is most effective when used in the context of learning and not as an end itself
Professional Practice	When planning, I incorporate the use of ICT in achieving curriculum goals: <ul style="list-style-type: none"> • I provide opportunities for students to use ICT as part of their learning • I provide opportunities for students to use ICT to gather information and to communicate with a known audience • I use a range of ICT resources and devices for professional purposes • I use ICT to locate, create and record information and resources • I can store, organise and retrieve digital resources • I use ICT to access and manage information on student learning.
Professional Values	I can identify when professional learning is required to effectively implement planning where ICT is integrated I select ICT resources appropriate for student learning in a range of contexts and for a diversity of learners
Professional Relationships	I operate safely, legally and ethically when using ICT I use ICT to communicate with others for professional purposes

The specific task at the centre of the analysis in this paper was explicitly linked to the second dimension of the Professional Values criterion, that is: I select ICT resources appropriate for student learning in a range of contexts and for a diversity of learners. [PV2]

The action of informed “selection” was central to the task and explains why the pre-service teachers (as subjects in the study) were asked to select something previously built on the basis of their understanding of the needs of particular learners. To do this is to directly demonstrate the TPK element of the TPACK model.

Method

The subjects for the study were a group of pre-service teachers in a postgraduate primary education degree in an Australian university (N=43). They were involved in an intensive ICT pedagogy program (3 days). As part of the low-stakes assessment associated with this program, they were asked to report their responses to five set tasks in an online journal. It did not carry “grades” but they had the opportunity to qualify for two levels of certification: the lower meeting program requirements with the higher equating to an externally accredited certificate previously discussed.

The journals were the single data source for the analysis presented in this paper. While the pre-service teachers were asked to complete five tasks, only one (related to learning objects) is reported on in this paper. The selected task, known as Task 1A and presented with the stated external criterion [PV2], required the following:

Select one of the learning objects available to you from The Le@rning Federation website [[http://](http://www.thelearningfederation.edu.au)

www.thelearningfederation.edu.au]. Consider how you might use this to enhance student learning.

Journal entry

1. Enter details of the learning object
2. Explain briefly how this learning object is appropriate for learning in a range of contexts and for a diversity of learners

In analysing the collated responses to Task 1A, open coding was used initially to identify emerging themes or categories. Axial coding (Creswell, 2005) was used as a second level coding procedure to make connections between the categories. The unit of analysis was the full text and multiple categories were assigned to each response.

Attention was paid to instances of exact word matches. For example, the use of the word ‘diversity’ was noted although typically defined in regard to differing age or needs groups. Attention was also given to synonymous terms; for example, the catch-all category of customisation was accorded to references to aspects such as open-endedness, own pace, and the ability to return/revise/repeat.

Further to this, a code- recode strategy was applied (Oriogun & Cave, 2008) through which the author returned to the data after an interval of time (2 months). From this iterative process, the 43 responses generated 180 instances across 22 categories including multiple intelligences, critical thinking and fun. Messages evidenced an average of 4.29 categories with a range of between 2 to 8 categories per response.

Discussion of findings

In this section, specific reference will be made to the task responses of three particular pre-service teachers. They will be referred to as Alpha, Beta and Gamma. Alpha's journal entry was typical in format (see Figure 1).

In the first paragraph of the response shown in Figure 1, Alpha, as required, identified and described the learning object, Energy-efficient houses [<http://econtent.thelearningfederation.edu.au/ec/viewing/L1149/>]

The second paragraph follows a sub-heading, How does this learning object enhance student learning? In this paragraph, Alpha spoke to the context and content of the learning object, for example, "is useful for a grade 4-6 class when studying science." Alpha also listed the educational concepts, here phrased as curriculum topics, related to the learning object, such as heat flow, energy efficiency, and properties of materials. Alpha also, critically in the demonstration of TPK, focuses on how students might interact with the learning object by referring to "hands-on manipulation," the concept of engagement and the more cognitive actions of critical thinking, predicting and problem solving.

The third paragraph refers back to the operational design of the learning object itself, here the feedback loop. In this, Alpha noted that "if students make an incorrect selection that results in a poor energy efficiency, an explanation and suggestion will appear and an opportunity for students to rectify their choice." Alpha has interpreted this feature as scaffolding student learning and goes further to indicate how teachers can manipulate the parameters of the learning object to cater "for the learning needs in the class."

The learning object I chose was **L1149: Energy-efficient houses**. This interactive resource involves students exploring energy efficient design variables in a house, for example, varying the materials used for insulation, and the window direction and covering. By selection different options to reduce air leaks, the direction of windows, insulation in the walls and ceilings, students investigate how these changes affect energy savings. Students also have the option of locating the house in Sydney, Alice Springs or Dunedin, which allows them to investigate house design that suits a local climate.

How does this learning object enhance student learning?

The learning object is useful for a Grade 4-6 class when studying science, specifically energy and change or environmental/sustainability issues. The educational concepts that students explore include heat flow, energy efficiency, properties of materials (such as for insulation), and data interpretation. It allows for hands-on manipulation of sources without needing access to the range of materials. It is also very user-friendly and informative, and engages students' critical thinking, predicting and problem solving skills. The learning object is appropriate for science learning as it is scaffolded to assist students' understanding. For instance, if students make an incorrect selection that results in poor energy efficiency, an explanation and suggestion will appear and an opportunity for students to rectify their choice. Teachers can use discretion and guide students investigating this resource by controlling or expanding the number of house design aspects to explore, thus catering for the learning needs in the class. Because this resource also incorporates a range of house design aspects, the teacher can guide students in further investigation on any number of topics relating to sustainable architecture, climate or energy, thus catering for the interests and abilities in the class.

Figure 1: Text of typical task response (Alpha)

It is of interest that Alpha did not deem the teaching and learning decisions as resting inside the learning object but rather being externally applied and controlled by the classroom teacher. This, in itself, is an indication of a growing awareness of technological pedagogical knowledge (TPK). This was similarly noted in the majority of student responses to the task.

As noted, the task responses were coded (and re-coded). The process yielded 22 discrete categories introduced in the previous section of this paper. A list and the comparative frequency of the categories is shown in Figure 2.

Table 2 presents details of the five most frequently occurring categories presented in reverse order to Figure 2. These together

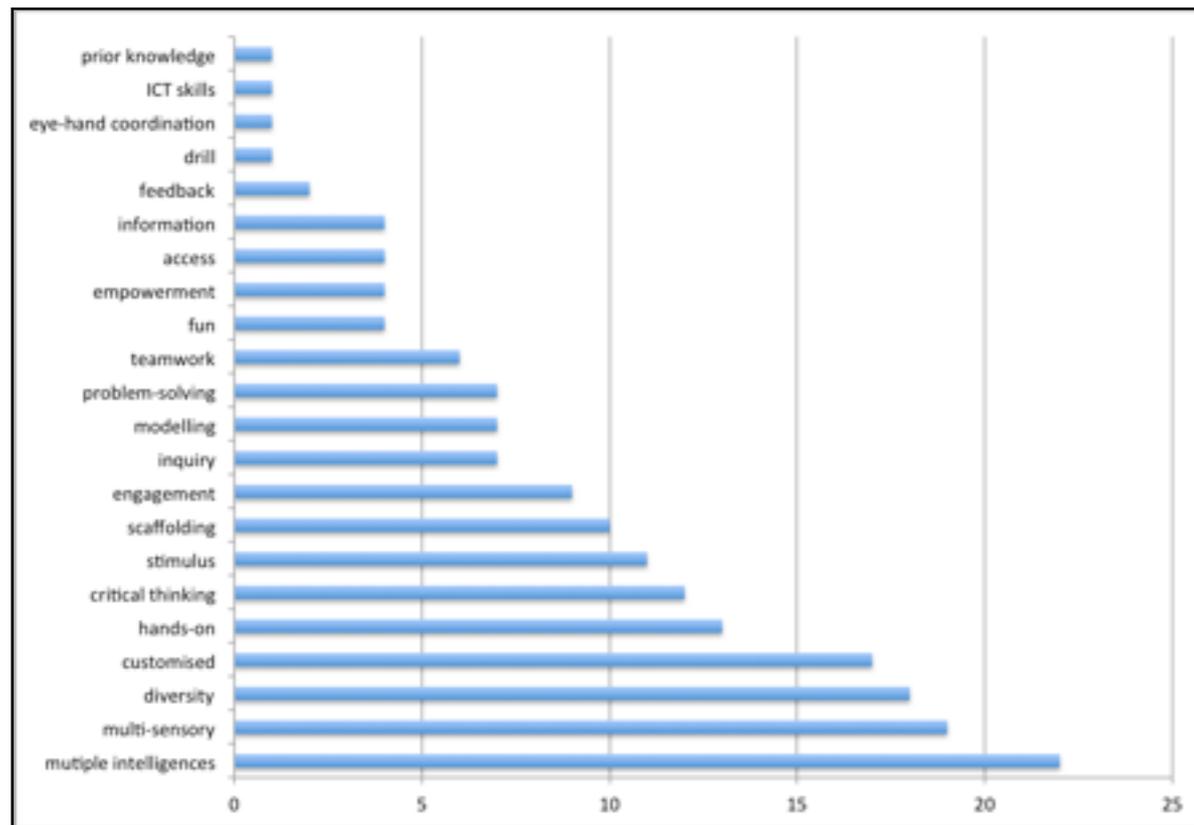


Figure 2 Graphic presentation of learning objects

represented half of all responses (n=89, 49.44%). Each category is illustrated in Table 2 by an excerpt from the responses including Beta and Gamma who, as will be discussed later, selected the same learning object for analysis but with differing interpretations.

As noted, the five most frequently occurring categories representing half of all responses are: (i) multiple intelligences (n=22, 12.22%); (ii) multi-sensory experience (n =19, 10.56%); (iii) diversity (n =18, 10%); (iv) customisation (n =17, 9.44%); and, (v) hands-on (interactive) (n =13, 7.22%). The predominance of references to multiple intelligences, frequently by a direct reference to the concept and to its key author, Howard Gardner (Gardner, 1983), could arguably be linked to the pre-service teachers' concurrent studies in educational theory. They similarly referred to standard teacher education texts, particularly Marsh (2008) and Reynolds (2009). This could be said to show a blurring of the T (Technological) and P (Pedagogical) in these pre-service teachers' burgeoning TPACK.

To return to the initial enthusiasm of this paper, focus needs to be placed on the breadth of categories that emerged from the responses. The responses, too, were drawn from educational theory, for example, critical thinking (n=12, 6.67%), scaffolding (n =10, 5.56%), inquiry (n =7, 3.89%), and problem solving (n =7, 3.89%). The categories with the lowest frequency were those that could arguably be seen to belong to older ideas of computer literacy and ones which do not display mastery of TPACK. For example, eye-hand coordination, ICT skills, and drill each appeared only once in the responses. The notion of the ICT resource as an information source appeared more frequently (n =4, 2.22%) but was some way down the list of purposes and placed

Table 2 Frequently-occurring categories of affordances of learning objects

Category	Definition/Illustration	N (43)	%
multiple intelligences	[L1149 Energy-efficient house] ... would also cater for a number of Gardner's Multiple Intelligences, most notably Spatial, Logical-Mathematical and Naturalistic, and if the activity was performed in a group setting, Interpersonal intelligence.	22	12.22%
multi-sensory experience (Beta)	[L20 Day sky, Night sky] It has both audio and text to allow those with difficulties to still participate in the game. ... this will cater to the students who are visual, audio and body kinetic learners as they listen, read and play.	19	10.56%
diversity	[Eco-Farm Learning Object] A range of diverse learners would benefit from this, especially visual and kinaesthetic learners, as the activity requires these skills for involvement. Students who have learning difficulties can also work through this learning activity (with assistance, if needed) and learn the concepts through play and interactivity.	18	10.00%
customisation (Gamma)	[L20 Day sky, Night sky] This Learning Object, suitable for years Prep, 1 and 2, enables students to explore the changing day and night sky and to identify the movement of celestial objects. The use of an interactive ICT model facilitates a student-centred approach whilst catering for diverse learners. Supported by visual, audio and interactive components, students can build a day or night scene and are given facts and feedback on their selections.	17	9.44%
hands-on (interactive)	[L700 Pushing and Pulling] In this activity, students experiment with force and mass by using non-standard units (e.g. monkeys) to help move recently arrived animals to the zoo. ... The size of the animals being moved may vary or students may be limited in the number of monkeys available to do the work.	13	7.22%

well below more cognitive and affective factors. This is arguably further indication of a significant change in this cohort of beginning teachers at least that computers were an end rather than a means to an end, a process rather than a solution.

There was similarly no reference to the use of ICT as idle amusement for students. Where fun (n =4, 2.22%) was listed, it was reminiscent of Chen and McGrath's (2003) definition of engagement in developing multimedia, that is, a complex experience comprising of enjoyment, concentration, perceived control, exploration, and perceived challenge. An example was:

[L20 Day sky, night sky] The object allows students to learn at their own pace, while having fun playing a game. It has both audio and text to allow those with difficulties to still participate in the game. As there are different types of intelligences in the classroom, this will cater to the students who are visual, audio and body kinetic learners as they listen, read and play [Gamma].

An unexpected category was teamwork (n=6, 3.33%) indicating that these pre-service teachers were thinking of the dynamics of the classroom and had embraced the notion of ICT as an aid to collaborative learning. An example was noted in the following response:

[L5207 Making a difference: The Day of Mourning protesters] ... the learning object can be used for individual students or for groups of students. If used for groups then this would subscribe to constructivist approaches to education as there will be a collaborative investigation conducted with a group consensus reached through negotiation, discussion and discovery. Even when conducted individually the student is encouraged to synthesise the data in order to form an opinion that is then recorded in their Notebook. If this is

then linked to a group discussion, the individual students are able to reconsider their answers and make changes, based on their new understandings.

The pre-service teachers (N=43) selected 32 distinct learning objects. Six learning objects were selected more than once. There were three selections of: L3248 Making a difference (Windaryne) and L700 Pushing and Pulling. There were two selections of: L5207 Making a difference (The day of mourning protestors), L9518 Discovering Democracy (Law), L949 Playground Rules and L20 Day sky, night sky. There was wide interest, motivated by concurrent studies in social sciences, in the Making a difference series, devoted to Indigenous issues with 19 instances (57.57%) of selections from this series.

The two pre-service teachers (Beta and Gamma), cited through this paper, who selected L20 Day sky, night sky differed in their analyses. Both indicated that the learning object could be customised and appealed to multiple senses (see Table 2). They then differed. Beta's responses spoke of empowerment and feedback while Gamma referred to multiple intelligences and fun. Same tool, different outcomes! For me, this indicated that part of the TPACK model which calls for teachers to know how teaching, here meaning their own teaching practice, might change as the result of using particular technologies. This close but not matching response occurred in all other instances of repeated selection. This would indicate personalisation or internalisation of how to teach with and through learning objects. These pre-service teachers were embracing the opportunity to work with new tools in new times, new tools to teach old things as well as pushing out to teaching new things.

Conclusion

This is small-scale, this is localised, this is personal, but, sadly, this is not conclusive. Still it feels like a liminal moment. There is something coming, something good. This group of pre-service teachers described in this paper seemed to grasp TPK – defined as the knowledge, existence and capabilities of technologies– and, without fail, chose a learning object to match a learning context or the needs of a particular group of students. They “knew” that this would change the dynamics of a classroom and they knew how to position formal and well-worn theories of learning into new places of learning. That their responses differed from each other is also encouraging as it spoke of a genuine individual ownership and an integration of TPACK into their practice.

There is a message here, too, for teacher educators and those leading professional learning. That is, to use the TPACK framework as the way to frame learning tasks rather than as a post hoc tool for analysis; and, to allow teachers to show rather than self-report on TPACK.

Something's coming. Something good.

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Integrating Facebook into a University cohort to enhance student sense of belonging

A pilot program in Sport and Exercise Science

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Abstract

The dynamics of how students respond to each other during online discussions in a blended learning environment remains under-explored in the literature. How this technology shapes interaction when used in conjunction with traditional teaching methods and the practices of learners in these multi-site situations is a significant educational issue. Using mixed-methods, this study drew on social interaction constructs such as: exchange theory; reciprocity; and propinquity to explore practices within a discussion forum in a blended-learning setting. In addition to confirming these well-established constructs accounting for student-interaction, the issue of responding to others perceived as 'knowledgeable' was uncovered, and the mechanisms behind this particular response were examined further. The study reveals an assemblage of practices overlapping and inter-locking with the emergent learning experience, in both online and traditional spaces.

Introduction

University students are confronted with many challenges throughout their tenure at University. Such challenges can be broadly categorised as scholarly (academic achievement), logistical (expenses, work-study balance, accommodation, transport) and personal (social and sport/physical activity commitments, peer and family support and expectations, career aspirations, sense of belonging). University attrition may be associated with any one of or a combination of these challenges and for decades Universities have implemented strategies in an attempt to maximize student retention. It has been identified extensively in the literature that interventions for enhancing the students' feelings of inclusiveness and sense of belonging may help to improve University student satisfaction and retention (Elliott, 2002; Hoffman, Richmond, Morrow & Salomone, 2002; Napoli & Wortman, 1998).

A general definition of sense of belonging is "the experience of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment" (Hagerty, Lynch-Sauer, Patusky, Bouwseman & Collier, 1992). Within the University domain, sense of belonging can be further defined as the "subjective sense of affiliation and identification with the University community" (Hoffman et al, 2002). The available literature has highlighted a variety of characteristics or attributes that underpin a University students' sense of belonging, and these include having similar values to others and a feeling of being valued or important and having social support (Hegarty, Williams, Coyne & Early, 1996), and having integration into a social network (Cohen & Wills, 1985).

University initiatives that have successfully enhanced sense of belonging within the University sector include First Year Experience (Pitkethly & Prosser, 2001), Orientation programs (McInnes, James & Hartley, 2000), peer mentoring (Glass & Walter, 2000; Treston, 1999) and learning communities (Baker & Pomerantz, 2000; Zhao & Kuh, 2004). These initiatives have largely focused on face-to-face interaction between stakeholders, and this may itself be one of the key mechanisms associated with the success of those initiatives. In light of the ever increasing reliance upon technology for communication and upon online delivery of tertiary education however, one must consider whether technology-driven initiatives to enhance sense of belonging among University students would also be successful.

Social networking sites allow individuals to establish and maintain connections or relationships with others and to present themselves and their social network to others (Ellison, Steinfield & Lampe, 2007). In December of 2011 the social networking site "Facebook", which was founded in 2004, had 845 million people as active monthly users with 483 million of these people further classified as active daily users (Facebook Newsroom, 2012). The prominent use of Facebook and other social networking sites has intrigued educators (Selwyn, 2009) and the use of social networking in education is emerging as a major research theme within contemporary higher education, particularly with respect to student engagement. Social networking sites have been used within the University setting for formal online learning and content management via technologies such as Blackboard (Landry, Griffeth & Hartman, 2006), for informal online learning (Forkosh-Baruch & Hershkovitz, 2012), for maintaining and creating social

capital among students (Ellison et al., 2007) and in one recent instance, as a communication link between the University and the community following a natural disaster (Dabner, 2012).

The aim of this pilot study was to establish a Facebook account for a Sport and Exercise Science Regional University cohort with the aim of enhancing the student sense of belonging. For the purpose of this pilot study, sense of belonging included being an active member of the degree cohort, feeling connected to the Sport and Exercise Discipline (peers and staff) and feeling engaged with the Profession.

Methods

A Facebook account was created for the Sport and Exercise Science student cohort at James Cook University, Australia. James Cook University is a multi-campus regional University that focuses on enhancing University participation for key equity groups including regional/remote (24%), low socio-economic status (20%) and indigenous (3.9%) backgrounds. For the purpose of this study, the Sport and Exercise Science student cohort consisted of students enrolled in one of five degrees across two campuses separated by approximately 400 km. The five degrees included the Bachelor of Sport and Exercise Science, the Bachelor of Sport and Exercise Science – Bachelor of Business, the Bachelor of Sport and Exercise Science – Bachelor of Education, the Bachelor of Exercise Physiology (Clinical) and the Postgraduate Diploma of Exercise Physiology (Clinical) courses. Approximately 350 students were enrolled across these five degrees and therefore were eligible to access the Facebook account and to participate in the project.

The Facebook account was established and monitored by an academic staff member within the Sport and Exercise Science department. The Facebook account provided general information about the University degrees and the overarching Sport and Exercise Science discipline and students enrolled in any of the five degrees were added as 'friends' by the staff member who moderated the account. Prior graduates of the degrees could also apply to be added as 'friends' as a mechanism to enhance industry links for students. Through the Facebook account the student and graduate 'friends' received information via their 'news feed'. Examples of information posted on the Facebook account included advertised employment opportunities, notification of advertised local or regional workshops or seminars that were relevant to the Sport and Exercise Science field, updates from the National professional accreditation body, and upcoming Discipline events such as student barbeques, student interdisciplinary competitions and research student presentations. The participating students were encouraged to showcase their achievements and exemplar University-related activities by uploading video clips to the account. Students were also encouraged to post comments about topics related to their degree, the profession/industry, or general University experience. The purpose of the Facebook account was to enhance student engagement and to provide an avenue for the Sport and Exercise Science department to advertise events and job opportunities. The purpose of the Facebook account was not to promote staff-student personal interaction and therefore the academic staff member who moderated the site refrained from any self-disclosure communication.

Evaluation method

An online survey was created with 'Survey Monkey' to assess the use of and effectiveness of the Facebook account in regards to the students' University experience and sense of belonging. The survey consisted of the following questions, with answer options included in parentheses as appropriate: Do you currently use Facebook (yes or no)? How many times do you log-on to Facebook each day (once daily, twice daily, between three and five times daily, more than five times daily)? Are you currently a 'friend' of (the specific Facebook account) on Facebook (yes or no)? If the participant answered 'no' to this question, they would be directed to answer the following two questions before the survey was complete: If you are not currently a 'friend' of (the specific Facebook account) on Facebook, can you please tell us why (free form text)? If you are not currently a friend' of (the specific Facebook account) on Facebook, has this survey encouraged you to become a 'friend' of (the specific Facebook account) (yes or no)? If the participant answered 'yes' to "are you currently a 'friend' of (the specific Facebook account) on Facebook?" the participant would be directed to answer the following questions: please rate the extent to which you agree that the (specific Facebook account) has provided you with the opportunity to engage with peers and members of the Sport and Exercise Science community, with respect to the following items (rated as strongly disagree, disagree, agree, strongly agree, not applicable): awareness of upcoming events within the Discipline; awareness of upcoming events within the local community; awareness of currently advertised careers vacancies/opportunities; belonging to the Sport and Exercise Science Discipline/Industry community; belonging to your specific cohort(class mates); the (specific Facebook account) is useful for

obtaining information and networking; the (specific Facebook account) has contributed positively to my University experience. Participants were also given the opportunity to provide free-form, open-ended commentary on what they liked best about the Facebook account with respect to the opportunities provided by the account, and also of how the Facebook account may be improved for future use.

The survey was administered ten weeks after the creation of the Facebook account. The online survey link (via Survey Monkey) was emailed to all students enrolled in the five Sport and Exercise Science-based degrees in order to capture both the users and non-users of Facebook. Ethics for the current study was obtained from the James Cook University Human Ethics Committee and all participants were required to provide informed consent via the first question of the online survey prior to proceeding to the survey questions.

Results and Discussion

'Friend' count: Within the first hour of creating the Facebook account 42 'friends' were acquired, after 24 hours the account had 134 'friends' and after one week the account had 182 'friends' who were all past or present Sport and Exercise Science students. Anecdotally, discipline staff reported to the researchers that immediately following the creation of the Facebook page, students were actively joining the Facebook account as a 'friend'; and were encouraging peers to do likewise. The creation of the Facebook account created a 'buzz' within the student cohort, accounting for the rapid increase in 'friend' count within the first week. Six months following the creation of the account, 312 students had become 'friends' of the account.

Facebook use by the University students

Fifty-five University students who were enrolled in one of the five Sport and Exercise Science degrees participated in the online survey. First year students accounted for 35.2% of the participants, 24.1% were in second year, 29.6% in third year, 9.3% in fourth year and 1.9% in fifth year. Almost all (94.4%) of the students surveyed indicated that they use Facebook, which is a similar user percentage reported previously for university students (94% Ellison et al., 2007; over 95% Madge, Meek, Wellens & Hooley, 2009). Almost half of the current study's participants reported logging into Facebook more than five times daily (43.1%) with 25.5% of participants logging on between three and five times daily. Students also indicated that they tended to stay logged on to Facebook for more than 10 minutes each day. Interestingly, while Ellison et al., (2007) reported the average daily usage time of Facebook by University students to be 10 to 30 minutes, the current study found that 25.5% of students indicated that they spent between 10 minutes and 30 minutes on Facebook each day, with 29.4% reportedly spending between 31 minutes and 1 hour logged on and 27.5% spending greater than 1 hour logged onto Facebook each day. These findings indicate that most of the participants in the current study are regular, high demand users of Facebook. This provides support for the work of Wodzicki and colleagues (2012) who report that social networking and social media, particularly for young people, has become an inherent component of daily life (Wodzicki, Schwammlein & Moskaliuk, 2012). Forkosh-Baruch & HersHKovitz (2012) argue however that while many people are users of social networking sites, the majority of users can be classified as 'active to a minor degree' or 'content lurkers and consumers' with a small minority classified as

'contributors'. The current study did not attempt to map the specific activity patterns of users, however it has been recognized that even the less active users (eg. The content lurkers) may still benefit from being exposed to the information provided by the social media (Forkosh-Baruch & HersHKovitz, 2012). Future, larger-scale projects should consider whether the type and frequency of use and interaction with the social media directly impacts on the participants' sense of belonging and overall experience.

Of the 51 students surveyed, 74.5% indicated that they were 'friends' with the account on Facebook. When asked to comment on the extent to which they agree with specific statements about the Facebook accounts' impact on their awareness of events, sense of belonging, and the overall student experience, positive responses were reported from between 67.6 and 94.6% of participants across all statements. Specifically, Table 1 illustrates the breakdown of positive (strongly agree or agree) and negative (disagree, strongly disagree or not applicable) ratings received for each of the seven statements (see Table 1). The largely positive responses recorded for the awareness of upcoming events and career opportunities concurs with the previous findings that the key use of Facebook University accounts by students is to find out about or arrange social events (Madge et al., 2009). Furthermore, Madge and colleagues (2009) indicated that 56% of their University student participants agreed or strongly agreed that Facebook helped them to settle into University and 54% agreed or strongly agreed that Facebook helped them integrate into University life (Madge et al., 2009). The current study showed similar findings but with a far greater positive response with over 70% of respondents reporting that the Facebook account positively contributed to their University experience and to their sense of belonging to the cohort.

When participants who were not yet 'friends' of the Facebook account were asked why they were not currently 'friends', three respondents had not heard about the account, four respondents had forgotten or were "too lazy" to be added, one respondent was currently setting up a new account, one respondent had "not thought of it" and one respondent was switching degrees the next year and so decided not to join. Of the participants who were not yet 'friends', 76.9% indicated that participating in the survey had encouraged them to become a 'friend'.

Table 1 University student ratings of the extent to which they agree that the Facebook account provided them with awareness of events and with the opportunity to engage with peers and members of the Sport and Exercise Science community.

Question	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
Awareness of upcoming events within the discipline.	5.4%	0%	35.1%	59.5%	0%
Awareness of upcoming events within the local community.	5.4%	5.4%	64.9%	24.3%	0%
Awareness of currently advertised career vacancies/opportunities.	5.5%	2.8%	61.1%	30.6%	0%
Belonging to the sports science industry/community.	5.4%	2.7%	67.6%	21.6%	2.7%
Belonging to your specific cohort (class mates).	2.7%	24.3%	40.6%	27.0%	5.4%
The Facebook account is useful for obtaining information and networking.	5.4%	2.7%	54.1%	35.1%	2.7%
The account has contributed positively to my University experience.	2.7%	8.1%	64.9%	5.4%	18.9%

Thirteen students provided responses about what they liked most about the Facebook account. Six of these students commented that they liked being kept aware of job opportunities within the field. Other responses included "I like that it's a way of communicating with others from Sports Science, and that it's a way of knowing what events are upcoming", "the cohorts updates on what's been happening", "very easily accessed for those already on Facebook", "the page is good as it allows me to see what is happening with the degree and what is possibly available in the region", "what events are on" and "it'll keep me connected even when I leave Uni". These comments can be broadly categorized into the themes of peer networking, and both intra-discipline and intra-professional awareness and engagement. The comments are similar to those documented in earlier social networking at University studies (Ellison et al., 2007; Madge et al., 2009); and provide further evidence that University students use social networking as an alternative medium for existing offline relationships, that is, they already know their Facebook 'friends' and are using Facebook to keep in touch (Ellison et al., 2007; Madge et al., 2009).

As this study was a pilot program aimed at determining the potential viability of a larger-scale within-discipline social networking initiative, the participating students were also given the opportunity to suggest ways that the Facebook account could be improved. Seven responses for improvement were received and these included "encourage people to post questions relating to our degree for a lecturer to answer", "there were very few updates. Only once every week maybe? Doesn't always have to be information... small things like "good luck with exams" etc..", "it will be interesting if the accrediting body had some topic sessions, or we can listen to more people whom work within the industry

and listen from their experiences”, “ more videos”, “never seen job opportunities”, “not sure” and “nothing really, it's quite a useful tool as it is”. These responses indicate that the students wanted more frequent updates and more interactive content to be posted.

The notion of increasing the frequency of content updates has previously been identified as a potential determinant of user engagement with social media, whereby regular content updates are likely to elicit more frequent site visits by users (Forkosh-Baruch & Hershkovitz, 2012). Therefore University departments that use social media for online communication with students may enhance student engagement by committing increased time to the regular updating of online content.

Conclusion

As this was a pilot study, the aims of the project were to evaluate the effectiveness of the Facebook account at enhancing student sense of belonging; and to identify ways to improve the project. The Facebook account was a convenient and effective way to communicate with University students on a regular basis and positively contributed to their university experience. Specifically, the Facebook account resulted in student perceptions of enhanced awareness of upcoming events and career opportunities and enhanced sense of belonging to the cohort and the profession.

Based on the student feedback and in contemplation of the available literature surrounding social networking as a medium for enhanced University student engagement, the current researchers have developed a list of ways to improve the effectiveness of the account for ongoing use. It is hoped that these suggestions may be useful for other University educators contemplating the

implementation of social networking into their Disciplines. The suggested improvements/alterations are as follows:

- Encourage students to post questions regarding specific topics covered in classes and other students or lecturers could respond or potentially lecturers could use the account to provide practice questions or study hints.
- The account moderator should commit time each day to update the ‘status’ and to provide a combination of specific information, reminders and general advice and encouragement.
- The educators should actively encourage students to interact/contribute to the account and not just to view the information.

While the researchers do not yet advocate replacing face-to-face communication with social networking at University, the researchers recognise that social networks are an additional communication media that is recognized as an important component of the University students’ social life and that it can be used effectively for a variety of University-based initiatives such as enhancing student belonging.

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