

A CASE FOR INCLUDING ONLINE PEDAGOGY AS SUBJECT MATTER IN ICT AND PEDAGOGY METHODS UNITS.

Michelle Williams and Paul Sutton
Digital Learning Futures, QSITE members, Ipswich, Queensland.

Abstract

The Teaching Teachers to the Future project provided an opportunity to try a new idea within the ICT and Pedagogy methods subject of the Bachelor of Education program. We believed that deliberately helping pre-service teachers transition from being an online learners to online teachers, coaches and facilitators would assist these new teachers to interpret Australian curriculum in a digital age connected context. This Paper contains some rationales for including online pedagogy in a methods course and illustrates how this part of the subject was re-designed. The paper included impressions from a lecturer about the impact of this decision on student learning and shares some student views about what they had learned enabling the authors to conclude that this approach needs to be continued to be developed in the next implementation of the subject.

Introduction

The Teaching Teachers for the Future project was a Commonwealth-funded project managed by Education Services Australia on behalf of the Australian Council of Deans, the Australian Institute for Teachers and School Leaders, and the Australian Council for Computers in Education. It was the first project recorded that supported all 37 Australian universities to “drive systemic change in ICTE curriculum and pedagogy in teacher education in Australia” (ACDE, 2011:1). The University of Southern Queensland (USQ) undertook a range of small projects within a larger program of activity to improve the quality of ICT pedagogy in the students’ experiences within the Bachelor of Education program, as did each university in the country.

USQ undertook an audit of its program to identify how ICT Pedagogy was included as subject matter, if assessment practices enabled students to demonstrate ICT pedagogy and how ICT pedagogy was modelled in the teaching practices of university staff. The data illustrated that as students travelled through their four year program, that they had much opportunity to learn about and demonstrate ICT pedagogy. Interviews with key staff indicated that the ICT pedagogy would increase and deepen in the year of the project and beyond. The findings revealed gaps in the students’ learning journey and plans were put in place to improve subjects in the program. USQ has a specific ICT and Pedagogy subject within the Bachelor of Education, which traditionally contributed significantly to preservice teachers’ knowledge of using ICT in learning. The project team began to look at what role this subject might take, if other subjects in the program continued to improve their ICT pedagogy subject matter, experiences and modelling.

The new ideas were cognisant of growing and changing network use in schools, and the impact of increasing connectedness of students, teachers and the community. The USQ context of online learning and wide scale adoption of a Learning Management System based on Moodle provided a natural stimulus for new ideas. The new subject design stemming from Connectivism foundations, began to look more like Sieman’s joint processes of sensemaking and wayfinding through rich artifacts and experiences in the new social network dominated spaces of the Internet. (Siemens 2011).

The new subject design deliberately focussed on online pedagogy as a central theme and required students design online learning episodes for themselves and peers as a strategy for developing knowledge and skills about online learning, mastering use of collaborative spaces for learning and using instruction design strategies when designing learning for school settings. The design extended the usual models for TPACK implementation (Koehler: 2012) for explaining and designing digital pedagogy to online learning design.

This paper shares the story of rethinking the role of the ICT and Pedagogy subject during the TTF Project timeline. It begins with a discussion of the contextual factors impacting the thinking, thus describing a rationale for changing the direction of the subject. The paper then describes how the pedagogy and assessment, combined with the different content, provided students with a broader understanding of ICT pedagogy. The subject planning process and resultant approach align with the Understanding by Design process (Wiggins and McTighe: 2011) which suggests assessment in authentic tasks should provide students with opportunity to deepen and demonstrate understanding when applying new knowledge to complex tasks; and that designing assessment first, before selecting curriculum activity in backward mapping should result in targeted pedagogy from the students perspective. Data from one cohort of students enables them to add their voice to the story to share what they did learn. This is complemented with some anecdotal recording what students did in response to the new directions for the subject.

The institutional context

There was long term evidence that students in the Bachelor of Education program were gaining knowledge and confidence in ICT pedagogy in many ways in their program. The national TTF project required institutions collect data on student confidence of their Technological, Content and Pedagogical knowledge and skills. USQ students indicated high levels of knowledge, skills, abilities and confidence to use this knowledge in schools, especially amongst 3rd and 4th year students. (Internal project data: 2012). This is supported by long term data mapping ICT capabilities of graduating students over several years (Jamieson-Proctor, R, Finger, G. and Albion, P.: 2010). It seemed like the ICT and Pedagogy Subject could have experimental room.

All students have online learning experience. Seventy percent of Faculty of Education student loads are designated as online and most students participate in an online course within their program at some time. All students have had experience of using a learning management system as a direct result of a faculty policy some years ago demanding compulsory use of a Moodle platform in what the university called its Study Desk. It seemed that students experiences as online learners provide a strong foundation for thinking about ICT pedagogy in an online world (Curriculum Corporation, 2005)

All students produce a Graduating Portfolio. During the audit of subjects, it was found that the ICT and Pedagogy methods subject was a major contributor to the extent of ICT pedagogy students demonstrated in their graduating portfolios as would be expected. The audit also revealed that a large number of students included ICT rich ideas from other subjects into their portfolio and that students were able to address the embedded ICT pedagogy statements in the Queensland College of Teachers (QCOT) standards for graduates, very well, partly because of the extensive use of portfolios throughout the program.. The analysis of the students' journey from beginning to portfolio, illustrated that at least, the ICT pedagogy subject needed to add depth and breadth of ICT pedagogy knowledge to the student's experiences gained elsewhere in the program.

Directions for change

A number of rationales began to drive thinking.

Nothing extraordinary- an expected goal

We wanted students to be able to interpret new Australian Curriculum with a digital pedagogy lens, where connectedness was assumed and understood. We knew that while methods units contributed to this goal, we knew we needed to do more to ground our students for meeting the challenges of modern connected schools, families and society and make the transition from digital-native students to digital native teachers (Lei, 2009). Contemporary ICT in learning discussions assume connected classrooms: that students and teachers connect both with information in various modes and media and with fellow learners, online experts, and others in ever-changing communities. (Finger, Russell, Jamison-Proctor and Russell: 2007). This research-based discussion in the literature is in contrast to a seemingly content-driven national curriculum direction which is in danger of being interpreted within an information delivery

pedagogy. (Board of Studies, NSW:2010). We knew that we needed to give preservice teachers sufficient and appropriate experiences to see beyond existing practice and current pressures, to take a leadership role in using the connected communities, networks and network services which increasingly alter our lives, working patterns and learning. We believed immersion in online pedagogy would do this. The Understanding by Design framework, (often known as Backward Design) offers a framework to understand how we this beginning with a clear understanding of the assessment design that would allow students to demonstrate their online pedagogy practice. (Marshall, 2011).

Changing leadership

We were conscious that the rapidly shifting demographic of teachers. Many will retire over the next 5 years creating a younger workforce and evidence suggest 30% of teachers leave teaching within the first 5 years of their careers. The Gen Y teachers change jobs. (Department of Education and the Arts: 2006, Richardson:2011). Thus we believed it was important to help these preservice teachers accelerate the level and type of ICT use in their schools in the first few years of their careers and to become the ICT leaders in their schools. Their generation of new teachers have a greater chance than for a long time, to write the agenda and make the difference in how ICTs are used in schools. It was important to ensure they were mentored to be creative risk takers and to have experiences which shifted them towards using Internet services (not just sites) and new ICT tools as pedagogical and curriculum tools.

A long term but increasingly prevalent concern

We were conscious of the underuse of Learning Management Systems in schools and systems. (QSITE: 2006, Baskin and Williams 2006.) Even though, there are always stories at ACEC conferences of the innovative and creative use of various online learning tools like wikis and blogs to learning management systems like Moodle and Blackboard, their use is not yet mainstream. This will change (Dua, 2012). State and non-state systems have built safe and secure environments to host online learning and sites and their use is likely to increase, even if policy will be required to mediate that direction. Increasingly schools networks are moving beyond being a place to manage software and devices (and the Internet connection) and host common file areas, to hosting learning environments where students and teachers can manage their resources, share knowledge, connect with others (hopefully outside of the school) and publish. Although school and system policy lags behind the reality of networked communities and the read-write web outside of schools, teachers will be expected to use these environments as pedagogical tools, just as their university colleagues have been. The current generation of pre-service teachers need to vitalise schools towards using such tools in new ways and maybe push policy boundaries so that schools computing more realistically supports contemporary school-age learners who carry better connectivity in their pocket than their schools provide.

Capitalising on experience

We realised that as students of a mostly online university, USQ undergraduate teachers had considerable experience of online learning systems as a learner and would have experienced a range of pedagogical techniques and digital resources during their program. We realized that our Pre-service teachers have more online learning experience than their lecturers. What a great opportunity then to move these preservice teachers from being online learners to online coaches and teachers and to ensure they met national and state standards for teachers which demand teachers use personal learning networks as their professional learning strategy, amidst other standards. (QCOT:2011, AITSL 2011).

The benefits for students

We had opportunity to strongly coach this 2012 cohort of students to use online tools and services in their transition from online learner to online teacher. We wanted to explicitly teach about online pedagogy and enable pre-service teachers to develop, practice and demonstrate online pedagogical skills. We had a number of arguments for this choice.

We wanted to contribute to the increasing demand for teachers able to teach in schools which offered online and open learning subjects, courses and programs. In particular we wanted secondary graduates to be able to support flexible learning options in schools where senior students attend TAFE or other programs or have apprenticeships and work experience in school time. Schools are learning to do this better and online learning solutions offer chances for students to have flexible learning paths. Further, rural schools often support online study options or host programs for students from multiple schools and/or locations.

We wanted our students to be able to develop online learning episodes for their onsite classes connecting their students with learning communities outside of the school and inside of the school. This is a deliberate attempt to shift the pedagogical use of the Internet as a source of information to be a strategy for students to connect with people, including fellow learners, teachers from many places and online experts, as well as a strategy to shift to network learning and participation, as a lifelong skill. The use of global authentic telecommunications projects between schools which the ACEC community supported for many years, seems to have disappeared from the pedagogical options as “looking up stuff” dominates. These new socially-networked teachers need to reinvent the landscape and design online learning events that support the development of new literacies of communicating online.

We wanted students to be capable of using the various tools of a learning management systems to enable them to capitalize on the pedagogical potential of the read-write web and its services. Teachers need to know how to design digital learning resources, produce online material, host and manage the systems for interaction and communication and organise participants and groups. Mixing technical skills with pedagogical and curriculum knowledge would only be an asset to these graduating teachers and their schools.

We wanted students to deliberately develop online pedagogical skills. Drawing on existing pedagogical knowledge, theoretical foundations and practical strategies, we wanted students to explore if teaching online requires different techniques and different approaches. Preparing for and designing an online event was an authentic way of exploring this problematic question, we all face.

We wanted to ensure these graduates knew that as life-long learners, they would draw knowledge and expertise available to them in Personal Learning networks, rather than be passive consumers of professional learning someone organised for them. We wanted to show by example, that professional behavior and attitude is changing in this connected world and that they needed to show evidence of their capacity to lead in that changing circumstance.

We wanted the graduates of the university to have standout and different qualities in a crowded market place. We wanted to provide opportunity for them to demonstrate leadership qualities in this regards.

Thus we built online pedagogy into the subject matter of the ICT and Pedagogy Methods subject and more than that, began the course with that agenda.

Design

The core design elements of the subject emerged from three established practices. The staff involved in the subject generally taught within constructivist frameworks, and believed teachers needed to experience constructivist pedagogical approaches as learners, especially if pre-service teachers were to be supported to demonstrate the development of their skills. The emergence of personal networks and connected professional communities as a sustaining element of professional learning combined with the connectivist idea that “knowledge exist[s] within systems which are accessed through people participating in activities”, (Wikipedia, 2012) dominated thinking about the context for and design of

learning experiences. Staff had considerable experience of using Authentic Learning Experiences as assessment devices to enable students to demonstrate high standards. (Herrington J and Oliver, R.:2000).

Amongst the usual subject matter of an ICT pedagogy subject, the core ideas of the new implementation included

- Pedagogical use of school networks or internet-delivered services
- The affordances of the read/write capacity of web 2.0 tools
- Learning community and networks of people as sources of professional expertise
- Roles for learning management systems in supporting learning
- How attributes of online learning systems support pedagogical activity online
- Instructional design
- Applying knowledge of thinking and collaborative strategies into online and blended learning pedagogies
- Using the TPACK Model to design and communicate ideas for online learning episodes.
- Skills development in using online editors, blog tools and other publishing environments including integration of collaborative tools, automatic feeds and linking across services.
- Rethinking digital citizenship

The subject had two parts, designing an online learning activity and designing an ICT pedagogy approach to curriculum, that would be implemented in a practicum. It was expected that the deep learning about online pedagogy and using a range of online services and tools would influence the students' interpretation of their curriculum and pedagogy, and result in students considering online events and activity as part of their ICT pedagogy toolbox. A focus on digital citizenship with regard to digital footprints, online etiquette and other issues was embedded into the course design by lecturers hosting online events with expert guests and a practical curriculum and policy planning task for assessment. The course products were drawn together by students developing a digital portfolio of evidence of their digital pedagogy practice. This portfolio design was centred on the Indicators for ICT pedagogy as published by Education Queensland and high standard portfolios are awarded Education Queensland 's Certificate of ICT pedagogy. (Education Queensland, 2012).

The core of the first part of the subject was to use experience a rich set of online learning experiences and artefacts/tools to shift to being a teacher and coach in an online or virtual space. This part is the focus of this paper.

Like with backward design processes (Marshall, 2011), we began with the assessment in mind. Teams were expected to collaboratively design and implement a learning experience for themselves, drawing on experts and involving co-learners. Students were asked to then to mine their experiences of being an online learner and facilitator, for examples of good online pedagogy and techniques. We also asked students to draw on all their learning experiences (including assessment) to design an interactive online learning idea for their contexts.

Establishing a team experience was central. Notwithstanding the professional dialogue about the equality of experience, effort and reward and the expected student groans about "group work", we did not want to portray that online learning is a lonely experience and we were convinced that team effort would repay dividends and that the quality of student work would be better. We wanted the network learning aspect to be the primary experience.

We suggested teams of four as we believed that was sufficient for a peer-level professional conversation. We also offered for teams to take on roles and that all teams should include a confident ICT user to lead the team through technical development. This also simulated the authentic environments where all projects in online environments use ICT support staff to support learning.

We wanted these new professionals to begin practicing taking responsibility to source and design their own professional learning rather than be a learner in someone else's design. (Bradshaw, P.; Powell, S.

and Terrell, I. (2002). We were aiming for a values shift here. This idea is central to the national and state standards we were helping students demonstrate. (AITSL:2011, QCOT:2010).

The reflection component was about drawing knowledge from experiences and recording what was learned, rather than recording what was contributed and critiquing on that contribution, as students reported they had done in many other subjects. Students were then asked to draw on their knowledge and experiences to outline a creative curriculum idea, without being too cognizant of barriers and drawbacks. The creativity of the idea was more important for this stage of the subject.

Like with a backwards design model, the coursework activities were planned last.

Each lecturer ran an online event as a model, illustrating event design, web site and interactive tools usage and a range of pedagogical strategies. The use of the learning management system in the subject by the subject coordinator, explored alternative ideas and conversation styles to what students have experienced elsewhere in their program. Students were encouraged to try some online short courses and to join in some networks and network activities. They were also encouraged to draw heavily on their own learning experiences in other subjects. They had a rich selection of examples to reflect on as learners, that used a variety of synchronous and asynchronous episodes, drew on extended community and supported a network model for learning (Harasim 2012).

Practical sessions and activities explicitly provided practice at using the online tools, scaffolded throughout the five weeks of the program. We were cognizant that the cohort included some digitally-shy learners and that in order to facilitate leadership in online digital practices, we needed to build confidence that only comes through supported but open-ended exploration and experience.

Theoretical foundations, immersing in background pedagogical ideas and drawing from what had been learned before, formed a background knowledge in which to build new ideas. The TPACK Model (Koehler 2012) and national example packages from the TTF project (Education Services Australia: 2012) were used as resources in learning activities.

Coaching pre-service teachers to take confidence from their experience as an online and on-campus learner to reach for the goal of being an online facilitator of learning or a facilitator of online or blended learning was explicit in conversations, approaches and discussion of the rationale for the subject matter and assessment.

Student teams were encouraged to conference with lecturing staff about their event designs and subject matter and often staff participated in events as co-learners.

To support confidence building and provide evidence of the rationales for the choices in the subject, the national and state standards for ICT pedagogy as well as state-based ICT student dimensions were analyzed and pre-service teachers were encouraged to make judgments about their own knowledge and skills and those skills they sought to nurture through their curriculum and pedagogical decisions.

Taking learning online and asking students to transition to being a facilitator of online learning was a timely opportunity and an authentic context for students to explore digital citizenship issues and teachers responsibilities to nurture good online practices and prevent online issues. This too was embedded in assessment tasks.

Results

The overwhelming impression of the authors is that the standard of student design, conduct, participation and constructive reflection of an online learning episode far exceeded the expectations of students' themselves. Students met the high expectations we set through the assessment criteria, and initiated highly interactive and deep learning events. Of the 14 events in the cohort reported in this paper, only 2 teams demonstrated a lower standard than others, but even here, a robust solid event with clear pedagogical techniques was undertaken, even though the design, subject matter or conduct was not creative.

We became convinced that the synergy of team work provided broader content and interaction and added greater depth of learning. An individual would not have developed the high quality of web presence around their event, or at least not all students would have been able to develop such a high standard of web presence or manipulation of a range of online tools on their own. The teams became the audience of their own work and for those teams who invited online guests and fellow students, the audience factor caused them to strive for the highest quality of product, clear directions, stimulating dialogue and deep discussion and reflection. Two teams hosted professional learning for teachers in school, in a model that could never have been successfully implemented by one student. The team work mattered and produced great results.

There was high energy participation in their own event and in those of colleagues. Students suggested the events were addictive, worth participating in and an important learning experience, both in terms of the subject matter of events and the experience of several pedagogical styles. The students brought their own content to the learning event/activity and had full control over what they learned and how it was learned. The motivation was intrinsic and intensely personal. In a workshop activity, students reflected that having choice of topics and issues and designing how it was best for the team to learn, added relevance and enabled a deep discussion in the relevant context (eg: early childhood), something less possible in generic lecture environments which need to serve all sectors of schooling.

The use of the TPACK Model as a design strategy and a communication model along with the emphases in the course discussions, meant that the technology seemed to be backgrounded amidst the pedagogical designs. The TPACK model also provided a way for students to explain their pedagogy and meet the indicators for the ICT certificate and national/standards statements.

Many students originally expressed some anxiety about mastering the technological tools required in the events. This seemed to dissipate somewhat as each team allocated roles, narrowed down the selection of tools required for their designs and they established their web presence around their event. Student feedback indicated growth in the knowledge of tools and their pedagogical attributes, confidence and pride in mastering the technologies and sense of achieving transferable skills and knowledge.

There was a little anxiety expressed about forming teams with some disquiet within two teams struggling to settle in, but then all teams managed to successfully design and implement an online learning event. The most difficult group to nurture were delighted when they finally implemented their activity hurrying to send us feedback that they had conquered their anxieties and were proud of their results.

A summary of the online learning events is at <http://usqmichellewilliams.edublogs.org/2012/03/30/wonderul-examples-of-creative-professional-work/>

The online event had some impact on student responses to the teaching practice preparation and general ICT pedagogy design for Assignment 2. The use of online tools as pedagogical props and for collaborative student work was strongly represented. Several students used various online environments as a learning management system. All students developed hotlists or other strategies to organise resources, and some provided their students with opportunity to publish online. Four students

selected a school of distance education as a practicum experience directly as a result of the broad direction of the subject. The evidence in digital portfolios and descriptions of how students evidence met the teacher standards was strongly peppered with online learning examples and online pedagogy approaches. It is the impression of the authors that the awareness of online pedagogy and online tools amongst this cohort of preservice teachers is high, and this will influence the ICT pedagogy approaches taken by these beginning teachers. We believe they have the capacity to influence their schools uses of the school networks early in their careers.

Student voice

A simple 3-question survey instrument was administered to one cohort of students. This was completed by 17 of the 30 students in one cohort.

What did you learn about online learning?

What do you want to do with what you learned?

Why do you think online learning is important as something pre-service teachers can know about and do?

The responses were coded and collated to see if patterns of responses occurred. The responses were read for meaning to unpack the messages about the student experience of what they had learned.

More than half the respondents commented on

Engagement - Online learning can re-engage many students / fun and creative / students using online tools every day & these need to be incorporated into the classroom.

Future - Looking to a digital future where teacher participation in online learning was seen as core pedagogy. An online technological literacy was deemed essential for the modern teacher.

Use – They believed they would use online learning activities and events as a strategy to use / adapt/ integrate ICT in the classroom to engage and enhance student learning.

One third also commented that they had learned how to use new technology tools, developed greater personal ICT skills and had thought about how to support the digital literacy skill development of their students. These pre-service teachers are consistently giving us feedback about valuing how they have been supported to learn ICT skills and supported to develop high standards for their personal digital literacy. Although the course itself does not have digital literacy as an objective or its subject matter, it is a clear need of this cohort. The assessment design and its implementation provided the scaffolding they needed without the messages about the T in TPACK becoming obscured. The feedback included comment that the models for skills and knowledge acquisition were valuable pedagogical lesson in their own right.

A third of the cohort drew the link between collaboration afforded by the read-write web and the collaboration goals of new curriculum documents. For many, they had participated in collaborative activities as a learner, but now had confidence they would continue to develop pedagogical approaches using Internet-enabled collaboration.

In the context of the TPACK model which underpins much of the subject content, we looked through the comments to broadly classify the directions of student reflections. We found the following:

Curriculum related comments - 22%

Pedagogy related comments – 44%

Technology or technology learning comments – 33%

From the variety of student comment and response, we interpreted that the students gained different outcomes, learned different things and drew different messages from their experiences. We are seeing the diversity in the survey results as the proxy for diverse learning styles. If this assumption is correct,

then we see that this event enabled students to meet their learning needs through our deliberate design to scaffold their shift from online learner to online facilitator.

Conclusion

The TTF project provided the opportunity to consider new ideas for rethinking the role for an ICT and Pedagogy subject in the Bachelor of Education program. We believed that the next generation of teachers needed to shape how ICT influences pedagogy over the next 10 years, hopefully jumping a generation of their reticent in-school colleagues. The read-write web and its connected communities and networks provides a context for how the next generation of teachers will interpret their curriculum, shape their pedagogy and shape their professional learning. We believed that more and more of school learning would occur online, or at least be mediated by the rapidly changing connected networks. The rationales for including online learning in methods curriculum, remains firm for us.

We began with a belief and decided to try this adaptation from previous implementations of the ICT and pedagogy subject. Some pedagogical choices were made. Using an authentic assessment task as a framework for curriculum design and pedagogy had long been a practice for the authors (Digital Learning Futures: 2010) so the design process resulted in a tight relationship between the assessment, pedagogy and curriculum. A practical task enabled students to learn by doing and to construct their own ideas about online learning. Modeling online pedagogical practice in the subject and using reflective strategies to assist students to reflect on their experiences as an online learner, combined to shift students to online event designers, mentors and coaches. The resulting student products suggested our first foray had been successful. The students through survey and class discussion suggested they understood what they learned and why it was important. It suggests to the authors that online pedagogy and use of new collaborative and online spaces is able to be included as subject matter and with effective pedagogy, can influence student thinking and practice.

Extending the subject matter of an ICT methods course from digital pedagogy ideas to include online pedagogy ideas is a simple idea and one which improves students ICT pedagogy rather than radically changes it. It's a practical change which does result though in much greater capacity for students to demonstrate the breadth and depth of ICT pedagogy capabilities inherent in the state and national graduate standards current shaping how universities frame their programs. It is worthy of consideration.

We conclude that as ICT pedagogy becomes increasingly prominent in general and curriculum-specific methods subjects, the role for an ICT and Pedagogy subject will continue to shift and change. Whatever we decide to do must provide pre-service teachers with a view beyond the ordinary and trusted uses of ICT in schools and provide them with the capacity to take a leadership role in shaping the next generation of ICT use in schools. Our next generation of ICT leaders in schools may be hatched from within ICT and pedagogy courses, if we push our faculties to be creatively experimental. Perhaps online pedagogy and use of associated tools and learning strategies will be a solid foundation for such professional growth.

References

- ACDE, (2011). Institutional Guide, Teaching Teachers for the Future. Published as part of project materials.
- Koehler, M. (2012). TPACK- Technological Pedagogical and Content knowledge: Just another Dr Matthew J. Koehler site. <http://www.tpck.org/> Last accessed April 12 2012.
- Australian Institute for Teaching and School Leadership (2011). National Professional Standards for Teachers: <http://www.teacherstandards.aitsl.edu.au/CareerStage/GraduateTeachers/Standards>. Last accessed 2 July 2012.
- Australian Institute for Teaching and School Leadership (2011). National Professional Standards for Teachers: ICT Elaborations for Graduate Teacher Standards.

- <http://acce.edu.au/sites/acce.edu.au/files/TTF%20-%20Graduate%20Teacher%20Standards%20-%20ICT%20Elaborations%20-%20200411.pdf>. Last accessed March 10 2012.
- Baskin C. and Williams M. (2006) Understanding the Potential. Keynote Presentation: QSITE State Conference 2006: Brisbane.
- Board of Studies, NSW (2010). Consultation report. English years k-12: Australian Curriculum. Sydney: Board of Studies NSW.
- Bradshaw, P.; Powell, S. and Terrell, I. (2002). Online communities - vehicles for professional learning? In: *BERA Conference*, 11-14 Sep 2002, Exeter.
- Curriculum Corporation (2005). *Pedagogy Strategy: Learning in an online world*. Carlton South: MCEETYA.
- Department of Education and the Arts (2006) *Workforce: Report on Performance 2005-2006*. Brisbane: Queensland College of Teachers.
- Digital Learning Futures (2010). Nauru Curriculum Footpath. Digital learning Futures web portal. <http://www.learningfutures.com.au/nauru-curriculum-footpath>. Last accessed July 2 2012.
- Dua, S (2012). Social networking in online education: it is time to revisit the Technology. CommUnity: Online Conference on Networks and Communities. Department of Internet Studies, Curtin University, April 21-23 2012. <http://networkconference.netstudies.org/2012/social-networking-in-online-education-it-is-time-to-revisit-the-pedagogy/>. Last accessed July 2 2012.
- Education Services Australia (2012). TTF: Teaching Teachers for the Future website and portal. <http://www.ttf.edu.au/>. Last accessed July 2, 2012.
- Finger, G. Russell, G. Jamieson-Proctor, R. Russell, N.(2007). *Transforming Learning with ICT: Making IT happen*. Frenchs Forest: Peason Education Australia.
- Harasim, L. (2012). *Learning Theory and Online Courses*. New York: Routledge.
- Herrington J and Oliver, R. (2000). An instructional design framework for Authentic Learning environments. *Educational Technology Research and Development*. 48(3).
- Jamieson-Proctor, R, Finger,G and Albion, P. (2010). Auditing the TPACK capabilities of final year teacher Education students: Are they ready for the 21st Century? Australian Computers in Education Conference, Melbourne, 6-9 April 2010.
- Marshall. R (2012). Using the Understanding by Design curriculum framework to integrate the Australian curriculum. Keynote to be presented to the Exploring and Implementing the Australian Curriculum Conference. Toorak College Mt Eliza Victoria. 23-24 July 2012.
- QCOT (2010). Preservice teacher standards for Queensland. [http:// www.qct.edu.au/standards/documents/PSQT_GradLevel_v3_Web.pdf](http://www.qct.edu.au/standards/documents/PSQT_GradLevel_v3_Web.pdf). Last accessed July 2 2012.
- QSITE (2006). *Designing ICT Services with Pedagogy in Mind*. QSITE Position paper. <http://www.qsite.edu.au/publications/position/network>. Last accessed March 10 2012.
- Richardson, E. (2011). *The aspirations and expectations of the new generation of teachers*. Melbourne: Victorian Institute of Teaching. <http://www.vit.vic.edu.au/SiteCollectionDocuments/PDF/New-Generation-of-Teachers-Discussion-Paper.pdf>. Last accessed July 2 2012.
- Siemens, G. (2011) Sensemaking artifacts Connectivism Blog. <http://www.connectivism.ca/> Last accessed March 10 2012.
- Wiggins, G. and McTighe, J. (2008) *Understanding by Design*. Alexandria: Association for Supervision and Curriculum development.

Author Details

Michelle Williams and **Paul Sutton** work in very small Cape York Indigenous outstations helping communities develop ways of using newly available Internet and phone capability, including home schooling options for children, management of land tenure businesses and connections to supplies, medical and social connections. They use their 35 years of experience using computers in traditional education settings to help Indigenous people learn and live with communications technology, many for the first time. In some wet seasons when Cape York travel is not possible, they support ICT in education projects, most recently with the University of Southern Queensland and the Great Barrier Reef Marine Park Authority.

