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Author

Campbell, Chris

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Ascertaining the Educational Technology Taught in Various School of Education Courses at One Australian University

Dr Chris Campbell
School of Education
The University of Queensland, Australia
chris.campbell@uq.edu.au

Abstract: It is widely acknowledged that it is important to teach a variety of technological skills to pre-service teachers so that they not only feel comfortable using the technology themselves but so that they can teach technology and thus the associated skills to their future students. This paper reports on the mapping of individual courses that make up the School of Education programs at one Australian university. Results are interesting as anecdotal conversations with staff suggest that more technology is being taught than is reported in the course profiles. The results suggest that there are some positives in the teaching of technology in the current education courses and that the technology being taught should be made explicit with the students so that the students are told what technology they will be both using and learning.

This paper reports on the mapping of individual courses to the amount and kinds of technology that make up the programs for the Bachelor of Education (Primary and Middle Years of Schooling) and the Bachelor of Education (Secondary), including the dual degree programs at The University of Queensland in Australia. The main goal of the Bachelor of Education programs is to "prepare graduates who can deliver flexible and creative teaching approaches to cater for the diverse learning needs of children and young adults" (The University of Queensland, 2011). This suggests that throughout the entire four year program students will gain in-depth and hands on experiences in technology so that they may be best prepared for both using technology and teaching with technology when they become teachers in the future.

Literature Review

Studies in the United States indicate that while teachers are using technology, it is predominantly used for low-level tasks such as word processing and internet research (Ertmer, 2005) as well as for presentation software and management tools (Harris, Mishra, & Koehler, 2009). Unfortunately it cannot be assumed that graduate teachers enter the teaching profession with an appropriate level of technology capabilities as one research paper reports (Jamieson-Proctor, Finger, & Albion, 2010).

There is one researcher who introduces the concept of learning levels related to technology use (Banas, 2010). The use of innovative and creative uses of technology enables pre-service teachers to build technology knowledge and work towards, with experience, developing refined technological pedagogical content knowledge. Banas (2010) explains that teachers need to move from a level of 'no technology use' to one of 'learning from' technology and finally through to a 'learning with' technology level (Banas, 2010, p. 126). This paper has been designed to investigate simple and complex uses of technology and it is hoped that many of the pre-service teachers begin their practice at the 'learning with' level. This may very much depend on the types of technology being taught throughout the pre-service teacher program.

Methodology

This project involved the auditing of course profiles (or unit outlines) to determine the technological, content and pedagogical knowledge that was evident. The various sections of the course profiles were categorized into the following areas:

- general course information,
- aims and objectives,
- learning resources,
- teaching and learning activities, and
- assessment

The teaching and learning activities were closely analyzed and it is important to note that one of the university's graduate attributes referred specifically to "the ability [of the student] to engage effectively and appropriately with information and communication technologies" (For a complete list see http://ppl.app.uq.edu.au/content/3.10.05-graduate-attributes#Procedures).

Table 1: The review of individual electronic course profiles.

Course	Number of electronic course profiles reviewed			
	General	**Math**	**Science**	**TOTAL**
Bachelor of Education (Primary)	13	2	2	17
Bachelor of Education (Middle Years of Schooling)	3	0	0	3
Bachelor of Education (Secondary) Dual Degrees	13	4	5	22

All available course profiles were downloaded from the School of Education website for the Bachelor of Education (Primary, Middle Years of Schooling, and Secondary) programs. The profiles that were collected were identified as the core courses, for each of the degree programs investigated in the study. As can be seen in Table 1, a total of 22 core course profiles were reviewed for the Bachelor of Education (Secondary) which included 13 compulsory core units. There were 26 core units identified in the Bachelor of Education (Primary), with only 17 of these being downloaded and analyzed as the Bachelor of Education (Primary) was a new degree and the remaining nine profiles were not available at the time of the mapping. Three of these profiles were also offered as core in the Bachelor of Education (Secondary) course. The remaining 14 mathematics and science courses are taught through other faculties and as such have not been analyzed as they were beyond the scope of influence of the School of Education.

Results

As expected content knowledge was evident in the greatest detail, while the technological and pedagogical knowledge was often embedded and not always visible in the course profile. Various types of technology is used and taught in both lectures and tutorials as can be seen in Table 2. The use of the technology ranges from straightforward to complex uses and was completed for both the lectures and tutorials as well as for the assessment tasks (not shown). It is interesting to see the number and diversity of the complex uses of technology from the course profiles. This demonstrates that technology is indeed being integrated into the courses and a good variety is being taught to students, thus preparing them well for their teaching careers.

Table 2: Technological knowledge used in lectures and tutorials as identified in the course profiles

Straightforward uses	Complex uses
Blackboard for information dissemination	Blackboard discussion boards
Blackboard for delivery of learning modules	Concept mapping
Digital images	CMS for website development
Email communication	Digital literacy
Internet resources	Digital storytelling
Multimedia lab sessions	Electronic journals
Online activities	eLectures
Presentations	Graphics calculators
TurnItIn	IWB flipcharts – developed by lecturers
Videos	IWB flipcharts –developed by students
Video taping	Mobile learning
Word processing	Peer teaching
Web searches – literature, research material	Robotics
	Second Life
	Technology workshops and clinics
	Web 3.0
	Wikis

One of the results of the mapping is that technologies that are being used throughout the courses are not on the list from the mapping. This is because not all course coordinators put the technology they are using or require the students to use in their course profiles. One course coordinator was using Twitter and a Facebook page with students however this isn't evident in the course profile. Other course coordinators were using learner response systems or clickers and they also were not evident in the relevant course profile.

Technological knowledge was used widely in many of the assessment tasks across the various courses. The types of assessment tasks using technology are shown in Table 3. Banas (2010) explains that 'deeper level learning and transformation occurs when technology is strategically integrated from a pedagogical standpoint' (p. 115) as in the case of some of the assessment strategies and uses. The range of activities varied and from straightforward uses to those that were more complex and required greater technological knowledge. The latter types of assessment activities also promoted higher order thinking, in both technological and content knowledge, for example the development of online games, and acknowledged real-world experiences, such as preparation of material for a YouTube Channel.

Table 3: Assessment items including technology

Straightforward uses	Complex uses
Analyse technology	Create an IWB flipchart
Complete online certification courses	Create a Wiki
Discussion board entries	Develop online games
Online journal searches	Podcasts
Submit assignments using Blackboard	Digital portfolios
	Evaluate digital resources
	Form an online learning community
	Literacy profile
	Online blog
	Online quizzes
	Online technology-based activities for students
	Produce a learning object
	Slidecasts
	Video production

Webquests

Innovation and creativity was found in the mapping of many of the course profiles and in particular, in the assessment practices of many of the courses as is shown in Table 3.

Discussion

As mentioned previously, Banas (2010) introduces the concept of learning levels related to technology use. The use of innovative and creative uses of technology enables pre-service teachers to build technology knowledge and work towards, with experience, developing refined technological pedagogical content knowledge. Banas (2010) explains that teachers need to move from a level of 'no technology use' to one of 'learning from' technology and finally through to a 'learning with' technology level (Banas, 2010, p. 126). With many of the complex uses of technology identified in this research, it is hoped that many and even most of the pre-service teachers graduating from this university begin their practice at the 'learning with' level (Banas, 2010).

The concept of learning levels is expanded through the study by Niess et al. (2009). This was a four-year study that identified five developmental stages that interconnect and integrate TPACK. The stages or levels are recognising, accepting, adapting, exploring and advancing (Niess et al., 2009, p. 9) Initially, they conceived that teachers' *pedagogical content knowledge* at the intersect of content and knowledge was primarily at the recognising stage, where teachers were able to use the technology but as yet, unable to integrate it. At this initial stage of development, the *technological knowledge* did not intersect with *pedagogical content knowledge*. As a teacher or pre-service teacher progresses to accepting and adapting, they begin to form opinions about teaching with technology and then make decisions regarding the use of technology. Technology integration is attained at the exploring stage and evaluation at the advancing stage. Niess et al. (2009) suggests that at the advancing stage this is where the intersecting of *technological pedagogical content knowledge* or TPACK occurs. This is an optimal place to be for a beginning and even experienced teacher.

Conclusions

This mapping divided technology usage into straightforward and complex uses for both the lectures and tutorials and the assessment tasks. It is hoped that in the future course profiles will have check lists where the course coordinator can check the types of technology being used in the course. This will possibly add to consistency throughout the programs and within the university. This will benefit graduating pre-service education students to enable them to commence their careers as individuals who are able to 'learn with' technology (Banas, 2010) while also integrating and evaluating technology, for its content and pedagogical appropriateness (Niess et al., 2009), thereby enabling and improving their technological pedagogical content knowledge. Ferdig (2006, p. 750) suggests that teaching and learning practices need to have "authentic, real-world problems, because they are interesting and meaningful to the students, and thus engaging". Although this is occurring in various courses by making it explicit students will feel confident they have this knowledge for when they are teaching in classrooms. This is important for course coordinator's to remember when they are creating their courses and having increased technology will assist in this.

Overall, the results from the mapping and auditing components of the study are very positive and suggest that there are a diverse range of technologies used across courses in both learning activities and assessment. As a result of the informal conversations with the course coordinators that followed the mapping and auditing phase, it became obvious that the staff were also using other technologies in ways that have not been identified in the course profiles and consequently were not able to be mapped during the audit. This is perhaps a unique situation for an Australian university with further research in this area a future possibility.

References

Banas, J. R. (2010). Teachers' attitudes toward technology: Considerations for designing preservice and practicing teacher instruction. *Community & Junior College Libraries, 16*(2), 114-127.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology, Research and Development, 53*(4), 25-39.

Ferdig, R. E. (2006). Assessing technologies for teaching and learning: Understanding the importance of technological pedagogical content knowledge. *British Journal of Educational Technology, 37*(5), 749-760.

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education, 41*(4), 393-416.

Jamieson-Proctor, R., Finger, G., & Albion, P. (2010). Auditing the TK and TPACK confidence of pre-service teachers: Are they ready for the profession? *Australian Educational Computing, 25*(1), 8-17.

Niess, M. L., Ronau, R. N., Shafer, K. G., Driskell, S. O., Harper, S. R., Johnston, C., . . . Kersaint, G. (2009). Mathematics teacher TPACK standards and development model. *Contemporary Issues in Technology and Teacher Education, 9*(1), 4-24.

The University of Queensland. (2011). Teacher preparation programs Retrieved 5th October, 2011, from http://www.uq.edu.au/education/teacher-preparation-programs-62663