Moving Mobile Mainstream: Using Communities of Practice to Develop Educational Technology Literacy in Tertiary Academics

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ABSTRACT

A case study of how a communities of practice (COP) model (Wenger et al., 2002) transformed a group of IT phobic tertiary academics (Cochrane, 2006a) into educational technology evangelists (Cochrane, 2006b). How the 'technology steward' (Wenger et al., 2005) guided the group in an investigation of the educational potential of various social software (web2) and elearning and mobile technologies (Cochrane et al., 2006b). And the culmination of the COP in a two hour workshop presentation (Cochrane et al., 2006a) by the group on their journey and outcomes (Cochrane et al., 2006c). Finally, how the model is now being used on an institution-wide basis for developing educational technology literacy in tertiary academics and establishing collaborative mobile learning projects. Thus moving mobile projects beyond the domain of the techno-geek academic and within reach of 'ordinary' academic teaching staff.

Author Keywords

Communities of Practice, Mobile, Social Software, Web2, Technology Steward.

INTRODUCTION

The Problem

1. Disconnect between technology skills of today's learners and today's teachers.

2. How to maximise the learning environment for academic staff.

3. How to promote mobile learning throughout the institution.

Today's learners naturally engage with technology as an everyday part of their lives (Prensky, 2005). However, when attempting to use technology to engage today's learners, there is often a disconnect between the techno-savvy of the learners and the lecturers. A recent article in the New Zealand TUANZ Topics magazine asks: "Are web2 communication tools such as blogs, wikis, webcasts and podcasts now an essential part of the teacher's toolkit?" (The article is written from a secondary school perspective). They conclude:

> You and I are the last generation that has the prerogative of deciding whether or not we're going to embrace technology. But the kids we are teaching now, the ones that are under my watch in the classroom, they aren't given that same prerogative. If they don't master these skills, I'm actually dooming them to a lower level of opportunity...
>
> The thing we need to understand about the type of learners coming to us today is that not only do they have different tools, but they actually process differently.
>
> Most kids are walking around with one or two cellphones in their pocket, using them to text their friends, surf the Web, take photos, and post to their blogs. And yet as soon as they get to school they're told to turn the cellphones off.
>
> If we'd just let students work to their strengths, instead of their weaknesses, we'll start to celebrate what they can do, and what they come to the classroom with - and that is a propensity toward technology (Putt, 2007).

In comparison, many of today's lecturers may be unfamiliar or uncomfortable with the use of the tools described above (Blogs, wiki's, RSS, instant messaging etc…). Before lecturers can implement mobile learning they require understanding and experience of a range of foundational learning technologies. Most mobile learning trials involve only a small number of lecturers, who are already techno-savvy enough to be confident in moving to mobile learning. To move mobile learning into the mainstream of an institution requires a strategy for up-skilling academics in integrating technology into their pedagogies.

The Solution

Development of peer group support guided by a teaching and learning professional, i.e. a Community Of Practice, investigating the use of web2 social software tools and then mobile learning in education. This

Community of Practice also provides a model for academics to use in their own student classes as they later integrate social software and mobile technologies into their courses.

COMMUNITIES OF PRACTICE

'Communities of Practice' (COP) is a relatively new approach to learning. The concepts were developed by Lave and Wenger, while studying the apprenticeship model of learning (Lave & Wenger, 1991), "Communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavor" (Wenger, 2005).

Social Constructivism

Social constructivism forms the underlying basis for learning theories such as 'Communities of Practice'. Constructivism is based on the work of Piaget (1973), Dewey (1916) and Bruner (1966). According to these theorists, knowledge is constructed from our own experiences, and facilitated by teachers. The learner learns by being involved in the learning process, constructing new concepts from simple ideas and previous experiences. Social Constructivism is an extension of constructivism, and is attributed to Vygotsky (1978), according to whom the social context is very important in constructing knowledge. Vygotsky argued that learning is a collaborative process of students actively constructing their knowledge through interaction with their peers and teachers while engaging with the learning tasks. According to Vygotsky the role of the teacher is to create and maintain the Zones of Proximal Development (Head & Dakers, 2005) – an environment that will help move the learner from their current understanding to a potential deeper level.

Characteristics of Communities of Practice

The main differences of Communities of Practice to traditional educational environments are an emphasis on inventiveness, evolution of ideas and direction of the community, and lack of hierarchy, as all the members in a Community of Practice interact as peers.

The three characteristics of Communities of Practice

- The Domain – the shared interest.
- The Community – some form of regular group relationship.
- The Practice – the development of a shared repertoire of resources, involving time and sustained interaction.

Legitimate Peripheral Participation

Lave and Wenger assert that passive community members learn from the active members of the community, and are gradually brought into an active role in the community.

Attwell (2006) draws a comparison between the concept of legitimate peripheral participation and Vygotsky's zone of proximal development.

> Bridging the zone of proximal development construct with legitimate peripheral participation construct may be accomplished if one thinks of a zone in which the expert or mentor takes the learner from the peripheral status of knowing to a deeper status… the expert scaffolds the environment to the extent in which the learner is engaged with the discourse and participants within the zone and is drawn from a peripheral status to a more engaged status. The peripheral learner interacts with the mentor, expert learners and peers within the zone. More able learners (peers) or the mentor will work with the less able learner potentially allowing for socially constructed knowledge (Attwell, 2006).

Social Software and Communities of Practice

Wenger (Wenger et al., 2005) discusses the contribution that technologies can make to communities of practice, in particular Web2, social software tools.

He describes two tensions that communities must live with but can mitigate using technology via a cycle of inventiveness:

1. Community implies an experience of togetherness that extends through space and time.
2. The relationship between communities and individuals.

Social software tools make a natural companion to Communities of Practice. 'Social Software' (interactive collaborative software) is one of the key features of what has been termed 'Web2' (O'Reilly, 2005). Examples of current and emerging social software tools include blogs, wikis, RSS, instant messaging, podcasting, social book marking, etc… (Farmer, 2004; Glogoff, 2005; Kaplan-Leiserson, 2004). The key characteristics of social software fit well with the pedagogies described above, enabling a natural and relatively simple approach to creating collaborative learning communities. Web2 is about moving beyond content delivery to an interactive collaborative environment with an emphasis upon sharing, ease of use, customization and personal publishing. Thus in the educational setting, providing opportunities for students to be involved in the learning process, to create their own unique collaborative environments that can be shared globally. This can involve the collation of a variety of media centric web based tools/sites that can be aggregated via RSS to form virtual eportfolios.

> This emerging class of flexible, boundary-spanning tools has been called social software by its proponents. The label points to the user's ownership of their software-mediated experience and to the ways that the software bridges between the individual and the group. Easy publication and easy group formation, driven by individuals, are key phrases in this new frame for online collaborative technologies (Wenger et al., 2005).

The Technology Steward

Communities of Practice can be enhanced with the use of appropriate communications technologies when under the guidance of a Technology Steward. The Technology Steward (Wenger *et al*., 2005) is a member of the community with a grasp of how and what technologies can enhance the community. They act as a guide to the rest of the community as the community learns to utilize and benefit from technology. The technology steward in these case studies is either Thom Cochrane or Giedre Kligyte from the Centre for Teaching and Learning Innovation at Unitec. Our experience indicates the crucial role of the technology steward in guiding the Community of Practice in their investigation of the pedagogical usefulness of technology. When applying a Community of Practice approach to a course/class environment, the technology steward role would most beneficially be that of the teacher. One of the biggest challenges in taking this approach is the changing role of the teacher. This includes the need to become techno-savvy in order to model the educational use of the technology. However when the teacher is not up to speed with the technology utilized by the community, or does not engage with it, then the technology steward role defaults to someone else within the community or class. The problem then is the potential for the community or class to go off on a tangent from lack of pedagogical guidance. The technology steward thus forms a pivotal role in the successful integration of mobile learning. When first implementing the ideas investigated during the COP a partnership with an external (to the class) Technology Steward is useful in building the academics technology steward skills.

CASE STUDY1: DUMMIES2DELIGHT

Beginnings

The Community of Practice (COP) was born out of discussions between the founding group member and the author (Academic Advisor – elearning & Learning Technologies). The COP was devised as a way of bridging the gap between today's learners and teachers. Admitting that there is a gap that needs bridging is a significant first step. The following is a selection of comments made by the members of the COP regarding their initial comfort levels with integrating technology into their teaching (Cochrane, 2006a):

Lecturer 1: "When people talk IT stuff, for me its like a foreign language – I don't even know if IT is the label I should be using".

Lecturer2: "In my Diploma programme we need more flexibility, we have a lot of students who want to come in at odd hours and are working, and this technology stuff should offer my students a lot. However I'm scared of it. I don't want to just dive in. In the past I've always hung back because I always think there's going to be bugs in the system".

Lecturer3: "I guess I feel a burning desire to learn about this stuff, but I've never created the space to do it, and I suppose that's an excuse".

Lecturer4: "I just feel totally out of touch with the technology, particularly when I see what my kids can do, and I haven't really had any motivation to go about updating myself. But I guess for me one of the issues is whether

the technology overshadows good pedagogy, and I want to be absolutely sure that technology enhances pedagogy rather than gets in the way of it".

The Journey

The technology steward chose a range of communication, collaboration, and social software tools for the group to investigate. The choices were made on the basis of a social constructivist pedagogy, constituting a selection of indicative technologies that would work well together and sites that had good policies on content appropriate for an educational setting. The COP was comprised of heads of schools within the vocational studies department of Unitec. From an initial six respondents five started the COP with four members completing the COP (one member withdrew due to health issues). The first meeting took place over breakfast in one of the campus café's, where the participants voiced their initial hesitations with using technology in teaching. This then became the baseline from which the group measured its progress. Weekly two-hour workshops were held in the Centre for Teaching and Learning Innovation's computer classroom, and participants were expected to interact and practice with each technology during the following week using their work and home computers. Regular revision sessions were also scheduled using a group wiki page (Cochrane et al., 2006b).

Notes and discussion forums were set up online for each weekly meeting of the COP using Blackboard – the LMS for the institution. Each participant was encouraged to create and maintain a student homepage in the Blackboard course updating it with links to their blog, flickr site, etc as they created them. Although Blackboard has been the official LMS for the institution since 1998, none of the group participants had used it beyond the very basics. However, Blackboard was the least threatening environment to expose the group to as they entered the world of cyberspace. The use of Blackboard as a learning tool was thus modeled by the technology steward as it was used to link and discuss the various social software tools. Their Blackboard homepage became a contact hub for the group participants until they became confident with RSS and subscribing to each others' social software sites. Topics included in the Dummies2Delight investigation are outlined below in Table 1:

Topic	Examples
Interactive use of LMS's	Blackboard and Moodle
Social Software in Tertiary education	An overview of current technologies
Blogging	www.blogger.com
Image Blogging	www.flickr.com, picasaweb.google.com
Instant Messaging	AIM, MSN
RSS and aggregators	www.newsgator.com
Wikis	Mediawiki, www.wikispaces.com
Podcasting	iTunes, www.podomatic.com
ePortfolios	ELGG
Digital Video	YouTube, BlipTV, iMovie
Mobile Computing	SMS Blogging via www.letmeparty.com

Table 1. Topics covered in the Dummies2Delight COP.

After gaining some confidence with the selection of social software tools that were investigated by the group, the group members began to document their journey from technological illiteracy to technological delight using a group wiki (Cochrane et al., 2006c). This became a focal point for the group to reflect on how far they had come and how to integrate the new ideas into their teaching practice. Eventually group members also began to feedback examples of how they were implementing some of the technologies with their own courses and students.

Nurture: Communication and Social Software

One of the key goals of the group was to create a collaborative environment utilising collaboration and communication technologies. The use of instant messaging became a cornucopian revelation for the group as a means of peer support when they were dispersed across the institution and at home.

> The beauty of IM is the immediacy of it. You talk in real time and so the conversation flows without having to wait for emails to go back and forward and it also allows for collective conversations. I can see that it can be addictive if you don't watch out (Cochrane et al., 2006b).

Subscribing and commenting on each other's blogs and photoblogs also nurtured the group.

> I think that being introduced to RSS stuff after having done Blackboard, Blogs and Flickr is a good idea because you start to get the feeling that it's all getting too vast, and then along comes RSS to make it all manageable (Cochrane et al., 2006b).

The weekly face-to-face workshops were also a source of group identity building. Finally, having a common concrete goal for the group kept them focused and ensuring that everyone was keeping pace with each other as they learnt.

> It is very easy to let the words roll off your tongue now. At the BoS today, I listened to Ray talk about Blogs, Flickr, RSS, Newsgator, Wikis etc as if they were words and concepts we had known forever. The words are easy. Some of the concepts are easy. Some are still complex and, while I can achieve some things independently, I am still not 100% clear about working my way painlessly and seamlessly around these. I can only assume that, like other technologies I have mastered in the past, it will become second nature with use. There is no doubt we've progressed enormously. But in helping Malcolm with some updates yesterday, I realised that I'm only just remembering some of the concepts. It is the use it or lose it concept (Cochrane et al., 2006c).

The Goal

A timeframe and goal were used to give the COP a focus and an initial lifespan. The goal was to present a workshop on the use of social software tools in education at the institution's Teaching and Learning Symposium in six months time. These were brainstormed between the group founder and the technology steward before the establishment of the COP, but were presented to the group as a possible goal for negotiation by the group at their first meeting. The group agreed with the proposed goal and timeframe, while also feeling included in the decision making process.

This goal provided the group with an opportunity to formalise their reflections, work together on a specific project, and produce a research output. By running this workshop, the group effectively became educational technology 'evangelists' and made regular progress reports at each board of studies meeting, creating quite a buzz and a lot of anticipation regarding the workshop presentation. The workshop consisted of demonstrations of instant messaging, the use of wiki's for audience participation (Cochrane et al., 2006a), and presentations by each group member on each of the social software tools investigated during the COP (Cochrane, 2006b). From the technology steward's point of view it was amazing to see the transformation of the group.

INSTITUTION-WIDE MODEL

Model

After the success of the first Dummies2Delight Community of Practice the Centre for Teaching and Learning Innovation (CTLI) decided to put more resources into developing this approach to academic staff development model as an alternative to blanket staff development workshops. The COP approach enables the COP members to define the scope and the aims of the learning explorations and enables CTLI staff to offer more targeted support. The prolonged engagement of 7 to 16 weeks ensures that the technologies are practiced over a period of time, as opposed to the one off encounters usually experienced in CTLI workshops.

Interest was developed throughout the institution by the Dummies2Delight workshop/presentation at the annual Teaching and Learning Symposium, giving the concept a high profile. As resources are limited, the current approach to creating Communities of Practice investigating educational technology is on an invitation basis. Invitations to form COPs are initiated with schools that either express an interest or appear to have the

potential to benefit from the approach. The model is currently in a viral mode of spreading. It is envisioned that eventually graduating COP members will become technology stewards for further COPs to be formed within their school.

An invitation letter briefly outlining the concept, commitment required, topics covered, and links to examples is sent to interested participants. Following this, a first group meeting is scheduled, usually involving coffee and food as an incentive. At the first group meeting a goal, timeframe, workshop style/modes and weekly time are brainstormed, along with an indication of what the participants' initial confidence with educational technology is.

Structure

Four to six group members per COP plus the technology steward meet weekly for a two-hour workshop to explore the educational potential of different technologies. After the use of elearning tools are established much of the interaction can be undertaken 'virtually' and flexibly if required, however the social element of meeting together has been found to be important in 'nurturing' the COP. The workshops are facilitated by either Thomas Cochrane or Giedre Kligyte, and can be held either in the CTLI multimedia lab, or elsewhere on campus (including the campus café Kreem with wireless laptops). Each different COP culminates in a specific project goal (e.g. a presentation at the Teaching & Learning Symposium, a presentation at a conference, a presentation to other academics in their department, incorporation of some of the technologies investigated into their own courses, a specific mobile learning project etc…). Topics covered include (but are not limited to) those outlined above in Table 1.

Topics, the goal, the LMS, and the COP workshop format are all open for negotiation with each COP group, allowing a customized experience relevant to each unique group, and allowing for the rapid change in the multitude of social software options available.

Key Issues

Some of the practical requirements to successfully support the formation and collaboration required for the COPs include:

- Participants require basic computing and Internet usage skills.
- Participants require access to their own computer and Internet connection.
- Participants require a mobile phone and data account.

EXAMPLE COPS

Diploma Landscape Design

One of the Dummies2Delight COP 'graduands' partnered with CTLI to integrate educational technologies to enhance a student group project. The project focused on using blogs and online photo albums accessed via both computers and WiFi Palm PDAs to document and reflect upon the design process for landscape designs for the Ellerslie Flower Show (A national Flower Show and landscape design event). In 2006 the students involved in the project received two gold and one bronze awards for their designs. The success of the project has led to on-going collaboration between the Diploma Landscape Design and CTLI. Effectively a COP is created involving the lecturer, the technology steward, and the students. The 2007 project is focusing upon using mobile phones for blogging to enable wider connectivity and more immediate posts. The success of the project is also developing interest from other lecturers in the department, with a COP with more of the teaching staff scheduled for semester two of 2007, with the aim of implementing mobile learning projects with a variety of student classes in 2008.

Product and Object Design

A pre COP collaborative project between CTLI and the Bachelor of Product Design identified several issues that could be aided by a COP with the teaching staff. The project involved students forming virtual design companies and using blogs and WiFi enabled PDAs to document their design process. Some of the issues identified helped establish the Dummies2Delight COP model. Issues identified included:

- Not enough technical support for staff and students (This identified the need for a Technology Steward and regular support sessions).
- Lack of lecturer engagement with or modeling of the pedagogical use of the technology.
- Limited connectivity for wireless PDAs (The campusWiFi network has since been extended significantly).
- Student preferences for their own mobile devices rather than loaned units.

A COP with the Design teaching staff has started during semester one 2007 with the goal of developing a more successful student mobile blogging project in semester one 2008. Already the lecturers' engagement with blogging and their understanding of the pedagogical potential have increased dramatically.

DISCUSSION

Successes

The Dummies2Delight COP created a core group of senior management evangelists in the institution that had previously not existed. This in turn led to an increased interest across the institution from teaching staff, many of whom attended the Dummies2Delight Teaching and Learning Symposium presentation. The COP model has led to a better use of the limited professional development resources of CTLI. The COP groups have resulted in a range of collaborative projects between CTLI, Lecturers, and Students. Finally, having a negotiated, concrete goal for each COP has facilitated measurable outcomes that are often unseen by the usual generic staff development workshop approach previously taken by CTLI.

One of the most exciting results is that the COP model develops strong relationships between the technology steward and teaching staff that can then lead to ongoing collaborative projects. These collaborative projects are then used to show-case innovative ideas as a way of getting new people on-board by contextualizing the integration of technology into teaching and learning with concrete local examples.

Hurdles

There are several challenges that have been identified in implementing the COP model. Some of the 'second-generation' COPs have not been as successful as the original Dummies2Delight group, leading to reflection on some of the assumptions made. Establishing a peer relationship between the technology steward and the rest of the COP participants is crucial to move the group from a traditional 'workshop' model to a COP model. Some participants have assumed the role of the technology steward to be that of a teacher for the group, and consequently there has been little peer support and collaboration in such groups. Establishing the COPs via an invitation from the technology steward to potential members has also required re-thinking. In a couple of cases we have unwittingly invited disparate groups of people to form a COP. A better approach has been found to be to invite a key staff member in the school to nominate/invite the other members of the group that they wish to work and collaborate with in a COP.

Other issues include managing concrete goals/outcomes to keep the members of the COP motivated. Group size is important to create enough interaction without creating too many peripheral members. The participants' require access to the technology being investigated, which requires a partnership with the institutions IT department. Installation and updating of software on lecturers computers and student labs is often restricted by the institution's IT department. Additionally, firewall and packet-shaping restrictions may make media sites (e.g. YouTube) and synchronous technologies such as Skype unusable. Finally, limited resources, including the number of available technology stewards currently limits the number of manageable COPs, making the move beyond viral implementation slow.

Key Issues

Some of the key issues in the success of a COP that have been identified include the importance of:

- The Technology Steward to guide the group
- Developing quality partnerships between the Technology Steward and teaching staff
- Dedication and peer support of the group
- Communication
- Choosing achievable goals
- Team building/nurturing
- Involving senior management
- Reflection
- Recognition of the uniqueness of each COP group

CONCLUSIONS

The use of a Communities of Practice model for creating academic peer support groups to investigate the integration of social software and elearning and mobile technologies into tertiary education has proven to be more successful and a better use of resources than general workshops for academic staff. IT phobic tertiary academics have been transformed into educational technology evangelists, and the participation of senior management in COPs has created a buzz throughout the institution. Academics who have participated in COPs feel better prepared for today's technology adept learners. While still in early days, the uptake

throughout the institution of COPs for educational technology is encouraging, and leading to collaborative projects between CTLI, academics and students. Staff who previously struggled with integrating technology into their pedagogical approaches are now implementing mobile learning projects with students, and thus we are seeing the awareness and uptake of mobile technologies in tertiary learning increase at Unitec. Key to the models success is its flexibility: recognizing that every COP formed is unique, requires negotiable content, motivational goals, and appropriate access to resources. Every COP will require a different approach for nurturing and motivation, however it must also be recognised that not all starting members will finish. Finally, the guidance of a Technology Steward is critical in establishing and guiding each COP in their investigation and use of technology.

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