m-learning for work based apprentices:- A report on trials undertaken to establish learning portfolios

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This paper reports on ongoing work that is being completed on developing a mlearning delivery package for apprentice bakers. These include:
- a report on trials of formative assessment questions using the mass text messaging (SMS) software eTXT, from New Zealand Telecom.
- the evaluation of web 2.0 applications (Flickr, Filemobile, Springdoo etc) to collate, archive and organise eportfolios of workplace based assessment evidence using mobile phones to gather the evidence in the form of photos, videos or audio files
- a summary of suggestions that can be used to construct a customised mlearning platform for use at CPIT
- the blending of various aspects of distance and mlearning that will be used to support mobile phone based delivery of a New Zealand National qualification
- a start at building a model for mobile learning pedagogy pertinent to workplace based learners.

Much of the detail of the above trials are archived in a reflective blog
http://mportfolios.blogspot.com and summarised in this paper.

keywords:- apprentice training, workplace learning, Web 2.0, mlearning, eportfolios

Introduction

This paper is a report on ongoing projects that are taking place at the New Zealand Baking Training Centre (NZBTC) at Christchurch Polytechnic of Technology (CPIT) to put in place mlearning based distance learning and eportfolio support for apprentices in baking.

The paper will firstly provide a brief introduction to the context in which the project has been carried out. An overview of what has taken place in mlearning, eportfolios and web 2.0 that is relevant to this project will then be discussed. Reports on the various parts of the project, findings and results then follow. The paper concludes with a summary of the future work on mlearning pedagogy that NZBTC plans to investigate as I work through the pilot for our mlearning project in 2007.

Background to the mlearning project at CPIT

CPIT is one of nineteen institutes of technology in New Zealand (NZ). It is the largest polytechnic in the South Island and offers a large variety of courses and programmes that lead to various local and national certificates, diplomas and degrees.

NZBTC is part of the national award winning School of Food and Hospitality administered via the Faculty of Commerce at CPIT. The NZBTC has been involved in training courses for the NZ baking industry since 1974. At present, the NZBTC offers a wide range of courses / programmes ranging from a full time one year pre-trade training Certificate to distance learning courses that cover the theory of baking

to apprentices. In the area of elearning, NZBTC also have a corporate elearning contract that supports bakery employees in New Zealand, Australia and Canada.

The NZ baking industry is now certified via a competency based qualification system that is supported by an industry training organisation (ITO) called Competenz. Competency based assessments take place when apprentices are on block courses, via completion of correspondence courses that cover the theory of baking and through work place based assessments. The majority of bakers in NZ are small businesses. Therefore the baking industry has struggled to cope with the paperwork and administration that work place assessments place on them. In 2004, Competenz began a review of the existing National Qualifications and in 2006, new National Qualifications in baking were registered on the New Zealand Qualifications Authority's (NZQA) framework. The NZ baking industry has used this opportunity to review the way in which work place based competency assessments are being carried out. A large sector of the NZ baking industry would like to transfer all assessment requirements to the providers of off job training.

The NZBTC is situated in the South Island whereas the majority of apprentice bakers work and live in the North Island of New Zealand. In 2000, distance learning courses were converted to elearning delivery. However, the number of apprentices who own or have ready access to personal computers (PCs) has remained static at 15% over the last 5 years.   Therefore, since the beginning of 2005, the NZBTC has been investigating and trialling mlearning delivery possibilities so that bakery apprentices can be supported through their training to complete their National Qualifications in baking. Informal surveys of bakery apprentice students between 2000 and 2005 reveal that 100% of apprentices own mobile phones.   Therefore the NZBTC mlearning project revolves around the use of mobile phones as the main mlearning tool.

In summary, pilots of the following will take place in 2007 with several groups of apprentice students. These are:-
- Course content for theory of baking courses delivered to apprentices on hard copy.
- Theory of baking courses supported using mobile phones via voice and text messaging (SMS).
- All formative / summative assessments for theory of baking and the written part of workplace based competencies to be delivered & answers collected via SMS.
- Evidence gathering to form eportfolios using mobile phone to take photos or videos and posted on photo collation applications on the web.
- Access to reference material via mobile web browsing for students with web capable phones.
- CPIT learning management system (LMS) accessed by mobile phone for students to check on their eportfolio collection.
- Collation and reflection on their eportfolio to be done when the apprentice comes to CPIT for their yearly block courses.

Introduction to possibilities for mlearning at the NZBTC

mLearning can be defined as "the acquisition of any knowledge and skill using mobile technology, anywhere, anytime, that results in an alteration of behaviour." (Geddes, 2004) mLearning also holds the promise of providing rich mobile internet experiences that are ubiquitous, accessible, rich in content, efficient, flexible, secure, reliable and interactive. (Wagner, 2005) Young learners are having their learning styles reshaped by rapid advances in information technology. (Dede, 2005) These emerging learning styles include fluency in multiple media and simulation – based virtual settings, communal learning involving diverse, tacit, situated experiences and a balance between experiential learning, guided mentoring and collective reflection. The current cohorts of apprentices are now situated in the generation Y grouping of people born between 1982 and 2000. Generation Ys are different not only with respect to their age but are shaped by the economic, social and political conditions and experiences they have grown up with. (McCrindle, 2003) Young apprentices are therefore the quintessential 'digital native' (Prensky, 2001).

Various projects on mlearning are summarised in a NESTA Futurelab (Naismith, Lonsdale, Vavoula & Sharples, 2004). The report provides examples of many mobile learning projects from around the world. These projects make use of a wide range of mobile capable devices to provide learning to a diverse range of students. It provides the CPIT project with the rationale that there is no real 'right way' but that each project should focus on how mlearning could fit into the learning context and student profile for the target user group.

Why use eportfolios?

Portfolios of student work to be used for assessment purposes have been around for a long time. Going back just a few hundred years, traditional craft apprentices would have had to complete a 'master piece' in order to complete their apprenticeship and enter the ranks of master craftsmen. This 'masterpiece' would often be a product supported with sketches, drawings and sometimes written descriptions of how the product was designed and manufactured. Therefore the concept of using a portfolio to track a learner's journey from novice to practitioner is not a new one.

Eportfolios are a way of digitally storing the evidence of a learner's skill and knowledge acquisition. They can be used to collect evidence to support competency based assessments and can often then be used to showcase a learner's achievement. There are different levels of eportfolios (Love, McKean and & Gathercool, 2004),

- Level 1 basically revolves around a scrapbook concept
- level 2 provides more structure to bring it up to curriculum vitae status
- The authors argue that a true web folio begins at level 3 whereby there is the ability for both the student and faculty to put together a working portfolio that showcases the student's work.
- Level 4 opens the web folio up to feedback from other parties that may include the student's families, employers (current and potential), various mentors and the faculty.
- At level 5, the web folio becomes an authentic / authoritative evidence that links the contents of the folio to standards, programmes and "other descriptors including higher order taxonomies."

It is therefore important in our eportfolio project, to avoid becoming stuck at level 1 or 2 with a 'show and tell' eportfolio. Instead, the construction of the eportfolio itself should involve input from the apprentice in selecting, archiving, describing and preparing material for inclusion in their eportfolio. The process will also require the apprentice to think about their skill / knowledge acquisition process when they link the evidence they have collected with the standards and learning outcomes expected. Apprentices will also need to be encouraged to provide backup text / audio descriptions of the photos / videos that they have selected so that meta-cognition is encouraged with regards to the eportfolio construction process. The provision of an easy to use, fully mobile phone accessible interface to support this process is therefore an important part of the project.

Barrett (ongoing) provides a comprehensive web site that is a good resource for any educator embarking on working with eportfolios. She has evaluated many generic (including word processors, slide display software, spreadsheets etc), off the shelf and open source software for their suitability for use as eportfolio repositories and collators. Her work has pointed me towards looking at the use of Web 2.0 applications for our work on setting up learning portfolios using mobile phones as the main evidence collection, collation and viewing tool.

Why use web 2.0 applications?
O' Reilly (2005) provides a good introduction to what is Web 2.0. Web 2.0 emphasises the use of the web as a platform for 'social software'. Users of the software generate the content that is hosted on various Web 2.0 applications. Blogs and WIKIs are the most common examples of the application of Web 2.0 for educators. Files that are archived on Web 2.0 applications are stored on the servers of the companies that provide the applications. Access to Web 2.0 sites is therefore possible as long as there is the ability to access the internet.

There are now many applications that bring together aspects of blogging and WIKIs on to sites like [myspace](#), [bebo](#) and [Windows live](#) that provide the options for archiving, tagging, organising and showcasing photos, videos, audio files, mp3 collections etc. These collections can then be shared with friends by providing them with the url of the site with private sites being accessed via the url and the entry of a password. Sharing of the contents within these sites is enhanced by the seamless way in which these sites also provide for internet relay chat (IRC) or email or even for SMS. These conglomerate sites are the ones most useful for use as a base for forming eportfolios. At the moment, the use of these sites attracts no charge and this makes them an attractive option for use for educational purposes.

The Trials
A series of trial in 2005 and 2006 were undertaken to work through the various aspects of mlearning delivery. Both the 'push' & 'pull' aspects of delivery were trialled. In the 'push' aspect, I tested out how a bulk text messaging system could be used for disseminating formative assessment questions. Trials of the 'pull' parts of my project revolved around the collection and collation of workplace based skill acquisition evidence into an eportfolio.

Trial one:- the push factor, trialling a text messaging system for sending out formative assessments.

This trial was completed with a group of apprentices and staff from the School of Food and Hospitality. A bulk text messaging application provided by NZ Telecoms called etxt was used. From the provider point of view, etxt proved to be very easy to use. I learnt from this trial that accessibility to students via text messaging to their mobile phones was extremely efficient. Students were text messaged a variety of questions on food safety through the course to two weeks. Question types included multiple choice, short answer, true / false, fill in the blanks etc. At the end of the two weeks, I text messaged evaluation questions to find out which question type the students preferred, how many questions would be most workable and how they found text messaging back answers to the questions that were sent to them.

Findings included:-
- multiple choice questions were the easiest for the students to text answers back to.
- Multiple choice questions were preferred followed by true / false questions and short answer questions.
- Short answer questions were the easiest to text message out due to the limitation of 160 characters per message.
- Most students were able to cope with 4 questions a day.

Trial two:- Pull factor one, harnessing the capabilities of web 2.0 applications for collecting eportfolio content

In this trial, I wanted to find out how easy it would be for students to set up accounts with photo or video aggregator sites and to send their photos, videos or voice files to these sites.

Desk top research revealed a large number of possible sites that could be used. However, many of these sites only worked with specific phone models, would only work in certain countries, or would only work for certain mobile providers. New Zealand, with its small population base was poorly served by mobile accessible sites although there were many worthy PC based sites that worked well. Many web 2.0 sites are also offered on a free for use basis while they are in 'beta'. However, once a large and loyal user base gathered, some sites started charging all users or more commonly started charging for enhanced services. Sites that did not attract a viable user base often cease to exist, sometimes without prior warning. Therefore the use of web 2.0 sites needs to be approached with some caution and established sites are less likely to disappear into the ether.

I therefore ended up trialling two sites that I had evaluated for their ease of use, robustness and web presence (ie not likely to disappear overnight). These sites were flickr & filemobile.

Both of these sites were easy to use from both the provider and the apprentice user point of view. Photos taken using a mobile phone were emailed to individual sites and I was invited by the apprentices via the site 'add a friend' application to view the photos archived on individual apprentice sites.

Trial three:- pull factor two, bringing eportfolio content in the form of photos, videos, audio segments and text into the CPIT Learning Management system (LMS)

At present, CPIT's uses the LMS [Blackboard.](#) For the purposes of this trial, the open source content management system (CMS) [Moodle](#) was used. The premise being that Moodle would be easier to tweak if required to accept links from other web sites and access via mobile phones. Linking the student webpages from flickr or filemobile to their own page on a Moodle course site was not difficult. However, accessing the Moodle page on mobile phones was sometimes a challenge. Keeping mobile accessed Moodle pages relatively 'bare bones' improved access via mobile phone. The ability to link each student's photo archiving site to Moodle meant that students would have all the facilities provided by the Moodle page set up for their course and also view their photo archive.

From the eportfolio aspect, there are many 'social learning' web based sites that are possibilities. However, I spent some time looking through a large number[1] and used the following criteria to narrow the list down:-

- Will allow mobile phone posting of text (blog), photos and possibly video or audio files as well
- Have an easy to use interface
- Will not cost anything
- work from NZ with the main NZ telecommunication companies' supported mobile phones
- viewable via a mobile phone
- linkable to Moodle

At the moment, I am trialling [Windows live](#). This web based application provides modules to store & display photos, keep lists of books etc. blog, store music, access Xbox games and provides the facility to share all of these with your friends. The application is very easy to use and allows text for blogs and photos to be posted to an individual's Window's live page from their mobile phone. I have also been able to link Windows live pages to various modules within Moodle. However, viewing the Window's live page on a mobile phone has not been possible due to the large memory & Micromedia Flash section of the page not loading up. Therefore, my search for a viable eportfolio showcase site continues.

Trial four:- push and pull, integrating distance delivery and working with eportfolios

This trial will take place in 2007. The two strands of mlearning for the project will involve:-

- The distance learning involved with the theory of baking courses and the written assessment requirements for workplace based competency.
- The gathering, collation and compilation of evidence in an eportfolio with the mobile phone as the main collection and viewing tool.

Mlearning pedagogy
The trials undertaken so far at NZBTC have opened up many possibilities for mlearning to be developed for workplace based learners. In particular, I have found

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[1] Many archived on [sacred cow dung blog](#) & some summarised on the wiki
http://cpitwebtwoinfo.pbwiki.com

that ease of contact with workplace learners has been enhanced and this has led to better rapport between teachers and learners. Using mobile phones and the Web 2.0 applications available online has provided workplace based learners with the opportunity to connect, create, collaborate and network. The principles outlined by the work of Brown (2002) with his treatise on how the 'web' has changed the way people work and learn and Siemens' (2005) connectivism learning theory have been pivotal in my work on blending cognitive apprenticeship models of learning (Brown, Collins and Duguid, 1989) to distance learning contexts. (Chan, 2005)

Mlearning provides the potential to enhance relationship building between learner and learner and learner & teacher. On many occasions during conversations or SMS sessions with apprentices, I have learnt much more than I have perhaps taught. Therefore, mlearning provides a vehicle for improved interaction which is not only situated (in that the learner is enmeshed in the learning environment the content is delivering) but also synchronous (allowing the teacher to enter into the situated environment of the learner at the time that learning could be most productive).

What will the future bring?
mlearning provides many possibilities and an as yet untapped potential for workplace based learners. Each context for the application of mlearning will be different. However, the basic advantages of mlearning can be utilised to reach a wide variety of workplace learners. Mobile phone technology is moving ahead rapidly with much of the development of new mobile phone applications being pushed by consumer demand. Ubiquitous computing whereby software is hosted on web based sites and available via wireless mobile devises is rapidly becoming main stream in many developed and developing countries. Educators need to be ready to put the time and effort into keeping up to date with the various developments in mobile phone technology that can be made use of for mlearning.

Many of the trials described in this report would not have been possible only 2 years ago. NZBTC plans to continually evaluate Web 2.0 applications that are useful to mlearning and to push the envelope for synchronisation of mobile phone access to institutional based LMS.

Conclusion
I still have much to learn on my journey towards establishing mlearning based courses and workplace evidence gathering support to apprentice learners who are completing the majority of their training in the workplace. However, the nature of mlearning has opened up better communication channels between teachers and learners. This enhanced, just-in time, situated and connected feedback loop has meant that I am able to trial and evaluate tools and applications quickly and effectively. Therefore, I am well placed to continue the ongoing development of mlearning as it moves into the pilot delivery stage in 2007.

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