Mobile Technologies in the Field: iPads – Rescuer or Rescuee?

Paula Williams
Australian Catholic University

Wai-Leng Wong
Australian Catholic University

Helen Webb
Australian Catholic University

Sally Borbasi
Australian Catholic University

Abstract

Universities are being swamped by waves of emergent technologies and the emergence of iPads is the latest 'state-of-the-art' mobile device to receive attention. While a number of iPad trials and initiatives have been conducted within the confines of classrooms, for example, Bond University, University of Melbourne and Adelaide University (Brand & Kinash, 2010; Jennings et al 2010; Cross, 2010); far fewer have been conducted in the field, see Duke University's use of iPad as a field research tool (Winograd, 2010). This study reports a faculty's trial to explore how far iPads could be integrated into a field setting for training of paramedic students in Wilderness Medicine. As it turned out, the remote setting for the exercise presented a number of challenges for the coordinators. Questions that needed to be considered included how "mobile" is the iPad?, How can it be used to support and enhance students' learning in the field?, How far could the iPad be extended where Internet connectivity is intermittent? The iPad trial highlighted a lack of a "common language" within the faculty as a basis to collaborate and design learning activities. It provided impetus for an ongoing series of conversations amongst the coordinators and others in the Faculty about design approaches and the need for a pedagogical framework to integrate technologies that support teaching and learning activities.

Introduction

Since its release in early 2010, iPads have been a phenomenal success for Apple and made significant inroads into consumer and business markets, and now the education sector. Articles with headlines like "Will iPads transform Med school?" (White, 2010) and statements such as "DOMINIC RISI was once reluctant to pick up a

book, but in the two months since he started using an iPad in reading tutorials, his mother has noticed a "wonderful" change" (Arlington, 2011) continue to propel interest in the iPad phenomenon.

iPads, much like other educational technologies "have originally been created for other purposes, either military or business – even classroom technologies like over-head projectors and PowerPoint slides (Bates, 2003, p. 8). Amidst the increased growth in spending on and use of ICT in higher education institutions, there are increasing calls to 'rethink pedagogy' for a digital age (Beetham and Sharpe, 2007). The new object, the iPad, is being scrutinised for its affordances - on how it can be leveraged to enhance teaching and learning.

We have adopted Conole and Dyke's interpretation that views affordance as not just limited to the intended, prescribed or designed function of technology: "We are also interested in exploring the creative and innovative way people respond to technologies and perhaps adapt them for use in unforeseen circumstances. An affordance of the technology does not simply refer to the intended use, but also to the unintended consequences" (Conole and Dyke, 2004, p. 301).

In this paper, we will sketch how our Faculty approached an iPad trial for a field exercise to support learning activities designed for the training of paramedic students. We begin with a discussion on planning and design for the field exercise trial, followed by observations from the field and some lessons learnt. The paper concludes with some salient remarks for others considering a similar event using iPads.

Field Exercise Planning and Design

In October 2010, the Faculty started a series of planning meetings exploring the potential for integrating the use of iPads within the disciplines of nursing, midwifery, paramedicine and exercise science. The portability of the iPad, availability of location based services, and ease of consuming and generating content readily accessible through use of one touch apps (applications) that could be used to enhance teaching and learning were definitely attractive considerations to staff (see Laurillard, 2007, p. 157 on how mobile devices and technologies can support learning activities).

While a number of projects were suggested, the paramedic training camp was selected for the first trial as there was a window of opportunity for some 20 iPads that could be made available for a short duration. As the iPads would be repurposed once the trial was completed, we made a decision to only utilise free apps.

The Exercise Digger's Trail is an inaugural but non-compulsory exercise for third year Bachelor of Nursing/Bachelor of Paramedic students at ACU Ballarat campus. The setting for the exercise is the Wombat State Forrest Ballarat, Victoria. Forty-two students participated in the field exercise. The coordinators and other directing staff (including trained paramedics) also participated in the exercise on a voluntary basis.

The Faculty understands the importance of students' attaining competence that will prepare them to meet the challenges in professional practice and that competence can be translated into effective performance when students are in practice. The provision of an authentic learning environment whether in the classroom, virtual space or field setting is a key component in the design of learning activities to support the delivery of such outcomes (Herrington and Herrington, 2006; Lombardi, 2007).

The premise of the field exercise was to take the students into a bush-setting away from the classroom and undertake authentic learning tasks. Lombardi distils the key characteristics of authentic learning (2007, pp. 2):

- Instructors are encouraged to design activities for their students that match as nearly as possible the real-world tasks of professionals in the field.
- The challenges students are asked to undertake should be complex, ambiguous, and multifaceted in nature, requiring sustained investigation.
- Reflection, self-assessment, and performance review are fully integrated.

- Teamwork is as essential to the authentic learning experience as it is likely to be in modern workplace settings.

Through a series of structured activities and assessment tasks designed to be as close to real world tasks as possible, students were expected to work in groups to achieve specific learning outcomes using a participatory approach to knowledge building and collaborative learning. Even though these were group activities, each student was expected to complete an exercise evaluation and was encouraged to complete a journal as part of reflection for the exercise.

The three learning activities for the field exercise were: 1) Navigation and Location 2) Wilderness Medicine 3) Search and Rescue. Each learning activity was designed based on real world tasks expected of professional paramedics. On successful completion of the field exercise, students were expected to demonstrate skill and knowledge in principles of wilderness medicine, navigation and search and rescue; utilise critical thinking skills, knowledge and evidence based practice to inform paramedic clinical decision making in a remote wilderness setting; demonstrate communication and interpersonal skills relevant to their professional development within the field of paramedic practice; and work as a member of a team and as an individual to locate, manage and extricate persons with trauma or medical conditions in the wilderness environment. (Webb, 2011, p. 2-3.)

In the preliminary planning for the navigation and location exercise, it was thought the iPad could be used as a back-up compass to parallel the handheld compass and provide geolocation coordinates for both true and magnetic north. Ideally at a 'touch of an app' it would triangulate a location in seconds. This was a good study in the efficacy of equipment versus handheld and mapping charts. The next thing was to get the students to do a 'screengrab' of the 'geolocation' shown on the iPad. This could be retrieved later to be used for discussion and analysis i.e. how much the coordinates deviated in minutes and degrees using the iPads compared to using a printed map with a hand-held compass.

Two months before the field exercise, the iPad project coordinator briefed all of the students on the efficacy of using GPS in navigation: from the very expensive GPS's used in shipping to the very inexpensive iPhone apps. She emphasised to students that the free GPS and free compass apps for iPhones/iPads had the lowest rates of accuracy. The understanding of efficacies of different GPS systems/apps would assist students make the right judgement call for navigation i.e. when to use devices like iPhone and iPads and when not to rely on them. There are occasions when the apps can be effective: for example, firefighters in Oklahoma used the iPad to help ambulance save an elderly patient in the snow where local maps were not readily available - the iPad did come to the rescue!

We had considered the Evernote app as an excellent tool for reflection of both procedures for the exercise. The recording functionality in addition to text/image capabilities of Evernote could be used to record reflections and be sent to the activity coordinator when there was connectivity.

In the second activity, students had to locate an injured motor cycle rider in a wilderness. In the design of the exercise, the iPads were pre-loaded with Clinical Practice Guidelines (CPGs) and Clinical Work Instructions (CWIs) plus an electronic Patient Care Record, which students were expected to complete during the Wilderness Medicine activity. Students were expected to work in groups to problem-solve and make decisions on how to treat the "SimMan" in a situated learning style on site with scaffolding provided by a trained paramedic. Working in groups, students had to demonstrate knowledge and competence and work collaboratively to treat the "SimMan" using the array of medicines and equipment available to them. They would record the observations and treatment in the Patient Care Record using neu.Annotate. We had planned for students to take turns to treat /transport the "SimMan" and record observations/ treatment plan. Students could also use the Evernote.app to record verbally what they observed and so provide a verbal report to go along with the

annotated Patient Care Report.

In the third activity, Search and Rescue, a "SimMan" has been placed at locations known only to the activity coordinator. The coordinates have been marked on the back of a puzzle set. Students were required to search an initial area to locate the puzzle pieces that would unlock the coordinates required for the next search area. The entire puzzle needed to be found in order to receive all of the grid reference/coordinates information. Once the coordinates had been retrieved, the students had to use map and compass skills to 'figure out' the new search area where the mannequin had been dumped. Upon locating the new search area, the group had to comb this area to locate the "SimMan", building on the techniques used in the first search. When the "SimMan" has been located, students then applied their knowledge and skills to treat, monitor and transport the "SimMan".

Observations from the Field and Lessons Learnt

We conducted a survey before the iPads were distributed and one after the field exercise. The preliminary data from our study confirms other Australian studies (Kennedy et al 2008; Kennedy et al 2007) that have demonstrated there are differences to Prensky's depiction of Digital Natives (Prensky 2001a; Prensky 2001b). One of the coordinators had thought that students, many who were avid users of iPhones, would have little problems transferring their adeptness on the iPhone to the iPads, and didn't think that students would have difficulty in using the iPads for the field exercise. However, based on the feedback and observations during the exercise, it became obvious we should have provided students more time to familiarise themselves with the iPad and the apps.

Our efforts to leverage mobile technologies in a paramedic training exercise in a remote location brought into sharp focus the use of mobile devices and technologies in remote settings where a number of the affordances are reliant on good Internet connectivity for example location based services and communication tools.

In relation to the iPad trial in the field, there were certainly a number of lessons learnt on how the iPad could be better integrated for future exercises. Getting students to fill out a patient record that they felt they could do far more effectively with pen and paper is not necessarily an effective use of technology. A re-design of the CPGs, CWIs, and PCR to leverage the affordance of the iPad is certainly required and that would involve some further development work. It would be appreciated if an app could be developed to record the observations and treatment plan that are provided verbatim, and those details then automatically transcribed to a Patient Care Record on the iPad. Saving a few precious minutes for efficient record-keeping could be vital to patient care and survival.

The trial in a remote setting tested the portability of the iPads and has made students aware of serious limitations of the iPads in certain extreme conditions where Internet connectivity may be intermittent which could result in loss of location based services. Instead of being totally reliant on the iPad for geolocation data in those conditions, the iPad could perhaps be used as a coarse navigational tool. Technologies such as 2-way radios, hand-held compasses, and physical maps are not subject to the vagaries of intermittent Internet connectivity and should still form an essential part of the training provided to paramedic students. In terms of accuracy of the GPS apps and concerns regarding durability of the iPad, if iPads could be made more robust and suitable for field usage such as at sea, the bush/outback and other rugged terrain, then the potential for far-reaching use would be enhanced.

Even though the coordinators involved in the exercise understood the aims of the iPad trial, other professional volunteers not involved in the preliminary planning of the trial expressed ambivalence towards their use in the field. However, one of the paramedics acknowledged that emerging technologies are inevitable in the paramedic field, and more could be done to explore the use of iPads compared to the system currently in use in Victorian ambulances to record patient care information, VACIS (Victorian Ambulance Case Information Systems)

technology.

The trial has also provided an impetus for a series of conversations amongst the coordinators and other staff in the Faculty about design approaches and the need for pedagogical framework/s to integrate technologies that support teaching and learning activities. During those conversations, it became apparent to the coordinators there was a lack of a "common language" to assist in conceptualising and designing learning activities. We are planning to provide a follow-up report on exploring learning design in the Faculty's teaching and learning initiatives using the Alexandrian Pattern Language approach in readiness for our next iPad trial.(See Goodyear, 2005, for a detailed discussion of educational design and the Pattern Language approach).

Conclusion

This field exercise was designed to be an authentic learning activity and on that count was hugely successful. Students indicated they had learnt from the hands-on experiences of search and rescue, and benefited from the guidance provided by the trained paramedics. There will be further discussions in the Faculty on the continuation of this field exercise in the coming year.

On the other hand the integration of the iPads into such intense and fast-paced learning activities to support paramedic training in the field, yielded mixed results. Nevertheless, we will use the lessons learnt from the exercise for future iPad trials, in particular ones conducted in remote settings. It is worth noting that there are situations where mobile technologies in all of its state-of-the-art sophistication cannot be fully relied upon as has been demonstrated through this field exercise. In such circumstances, there is always a need to have other technologies, not as backup but as a core technology.

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