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Version: Accepted Manuscript

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Building Mobile Learning Capacity in Higher Education: E-books and iPads®

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ABSTRACT

The growing popularity of e-books, e-book readers and tablet devices is forcing a reappraisal of the various functions of 'the book' in education. Furthermore, e-books are becoming a more salient element in the ecology of mobile learning, as new devices make reading a more comfortable and sociable experience. We report on the results of an 18-month project (2010-12) undertaken as part of The Open University's Building Mobile Learning Capacity initiative. The project introduced a group of Associate Lecturers to interactive e-books produced by the university and to the iPads® on which they could be accessed. The proliferation of increasingly interactive e-books and e-book collections calls for an examination of their evolving pedagogical purposes; an important aim of the project was therefore to enable this group to form ideas of how these resources could be incorporated in distance education and professional development of academic staff/faculty. The project used surveys, focus group meetings, online forum postings, blog posts and wikis to enable participants to record their experiences and ideas. One project output has been the identification of a spiral of six key use case areas for e-books. In particular, the categories 'situational reading', 'collaborative/group learning' and 'e-book production' inspired a collaboratively designed group activity for a face-to-face outdoor tutorial, which was trialled and is described in this paper. The experience has relevance for the design of blended learning as well as for mobile learning activities in many other settings.

Author Keywords
e-book pedagogy, collaborative learning, situated learning, academic staff development, distance education

INTRODUCTION
E-books are increasingly popular and have a perceived value as relatively low-cost, easily accessible resources in education. However, a compelling pedagogical rationale and methodology for their adoption is yet to be fully articulated. In this paper we look at how innovative learning can be achieved through a shared exploration of e-books and iPads® among a group of academic staff (faculty) in Higher Education who are interested in changing their teaching and student support practices. We report on the results of an 18 month project (2010-12) led by The Institute of Educational Technology (IET) at The Open University, UK, as part of the university's strategic Building Mobile Learning Capacity initiative. This initiative has been exploiting Apple's iPads®, which are acknowledged to be a popular colour tablet device, used for many purposes including commonly as an e-book reader. The project has focused on the academic value of both the iPads® and a variety of academic e-books that can be read on these devices, although we have also included use of the iPad® for leisure activities and to address workflow productivity. We have identified innovative uses of e-books and tablet computers in various learning situations and consider the implications for the design of new learning materials, activities and programmes.

In 2010, The Open University was one of the first universities worldwide to make its in-house developed interactive e-books available on iTunes U®, and it continues to innovate in this area. Over the past decade, the university's Institute of Educational Technology has developed expertise in pedagogical and usability evaluations of e-book use alongside other research in reading and mobile learning (e.g. Waycott & Kukulska-Hulme, 2003; Twining *et al*., 2005; Kukulska-Hulme, 2005; Kukulska-Hulme & Pettit, 2009; Kukulska-Hulme *et al*., 2011). The current project also draws on technological innovation from the university's Knowledge Media Institute, and the Learning and Teaching Solutions unit where new learning systems are developed and supported. One key finding from our previous research is that e-books on portable devices fit in well with the lifestyle needs of distance education students, who often combine work with study; furthermore, reading e-books and academic papers on personal mobile devices is already a fairly popular activity among Masters level students (Kukulska-Hulme *et al*., 2011). Similarly, Nie *et al*. (2011) have found that work-based distance education students appreciated the flexibility and improved use of available time that e-books can offer. Indeed, studies on e-book use in education have largely focused on students' perspectives rather than those of their teachers. However, student experiences have not been uniformly positive. Woody, Daniel & Baker's (2010) research suggested that students prefer printed textbooks to e-books, while Cutshall, Mollick & Bland's (2009) work indicated the need to break content up into smaller chunks to match it to students' Internet reading habits formed through the use of social networking. A survey conducted by Foasberg (2011) concluded that a very small proportion of students use e-readers, with price being

the greatest barrier to e-reader adoption. A study by Kang, Wang & Lin (2009) reported that reading an e-book causes significantly higher eye fatigue than reading a conventional book, while Lam *et al.* (2010) have noted significant challenges in the technology itself and the approaches needed in the pre-reading process of finding and downloading e-books. Therefore issues of design, usability and costs are important factors in decisions about adoption of e-books and e-book readers, but interface and content designs are rapidly evolving and costs are falling.

Research on educators' perspectives currently delivers reports based on opinions about advantages and disadvantages (e.g. Jamali, Nicholas & Rowlands, 2009; Bierman, Ortega & Rupp-Serrano, 2010). However, if teachers have little or no direct experience of using e-books and e-book readers, there is a risk that they will not be able to support their students or design appropriate resources and activities for them. For this reason, we resolved to work together with a group of academics for whom experimentation with e-books and iPads® represents not only an opportunity to develop their teaching, but also a new way to engage with personal and professional development Kukulska-Hulme (2012). As part of this professional development, academics can begin to reflect on their pedagogical approach and how this might need to evolve or change to accommodate e-books as part of a repertoire of educational resources and a possible focus for active and social learning. In particular, interactive e-books and e-book collections invite a re-examination of their evolving pedagogical purposes. Furthermore, Weller's 'pedagogy of abundance' (Weller, 2011) suggests the need for new learning models which assume easy access to multiple learning resources. We propose that e-books may be conceptualized in various ways, for example as new cognitive tools that exploit multimedia capabilities to engage and reinforce learning; as social tools enabling community-building through sharing or collaborative annotation; as a further step towards greater inclusion and accessibility; or as part of an emerging industry of self-publishing and disaggregated content.

In the next section we describe our method of working with the academic staff involved in our project and present their experiences with using interactive e-books on iPads®.

ANALYSIS OF THE ASSOCIATE LECTURER EXPERIENCE
As an integral part of the project, 12 Associate Lecturers (AL) were given wifi enabled iPads® in March 2011 to experiment with as potential tools to support teaching and learning. In addition a closed forum was set up in the Open University Virtual Learning Environment for them to share their experiences of setting up and getting familiar with the devices and to share their experiments of using them for teaching and learning. Each tutor was also given a personal blog which was only viewable to themselves and the project leaders to help them document their experiences. The twelve Associate Lecturers came from a wide range of disciplines.

In June 2011 they were sent an online survey to complete for the project team to capture and evaluate their views on the iPad® as an e-book reader and teaching tool. The survey was not anonymous and the results were shared for discussion with the associate lecturers in the group. In May 2012 they were sent a second online survey, to evaluate their views after more than a year of using the iPad®. The data from this second survey have now been collected and a full analysis of the data is being conducted. Some of the initial findings are of interest – ALs are now using the iPads® much more in public in a mobile capacity and also for work purposes in family space so as not to miss out on family time. Over the period, there was increased use of the iPads® as e-book readers although there was less use made of the Apple iBooks store and more use of copyright free materials. The ALs also report the iPad® as becoming a much more integrated tool in their daily lives and that for some it had changed their work practice and thinking.

In addition to these surveys, we were able to draw on focus group meetings, 18 months of online forum postings and blog posts in an online community, as well as wikis created during the project. This approach enabled a good degree of triangulation and the opportunity for participants to enter a cycle of reflection on their experiences. Through these data, we have identified six key use cases which need to be considered for e-book use (for pedagogical guidelines arising from these uses and a fuller analysis of the data, see Smith, Kukulska-Hulme & Page, in press). These six aspects can be represented as a widening spiral of activity symbolising the user's transition from novice - exploring the intrinsic features of e-books, through to expert - academics producing their own e-books. The user's journey begins with basic e-book use and exploring functionality, they then might move onto using the e-book in a range of locations, perhaps initially for simply reading and then for learning. From using one e-book, the user then begins to use multiple resources and from working alone they may move on to work collaboratively. The final phase of the journey is when the academic produces their own e-books.

Basic E-book Use
Many of the standard e-book features are valuable additions to academic texts, particularly the ability to resize text and images. Bookmarking and annotation are also commonly seen in e-books but often they are very simple and do not 'talk' to other packages. The availability of even simple searching replaces to a large extent the need for a detailed index – however, searching on concept terms will still be an important element of academic texts and will need to be retained. Authors need to bear in mind that not all e-book reader devices are able to render colour, let alone interactive features. However, the motivating potential of including multimedia elements into their e-books should not be underestimated.

Situational Reading

The most important aspect of e-books is their portability, since e-books can be carried and read regardless of their size and weight. For academic texts this is a significant advantage of e-books. Also when available, internet access allows for just in time downloading and use. 'Situational reading' takes place when one or more books with desired content are easily available to learners when needed, thus matching readers' requirements in relation to the situation they are in. Traditionally, popular books sold at airports are well matched to what many people like to read on a flight or on holiday. Situations associated with mobile reading can include a daily commute on the bus or train, a field trip or a gallery tour.

E-books and Learning

An e-book can contain all of the resources needed by a student in one bundle. As a distance learning provider, The Open University often asks students to read print based texts, watch videos, access the internet and take part in online forum discussions – all of these can be combined into a single e-book. Often the contents pages allow the student to jump directly to a page and to bookmark it. However, e-books do present problems, since academic texts need to have more sophisticated annotation facilities including the easy export of notes and annotations to other packages without further extensive editing. Furthermore, we did not come across any easy mechanisms for producing page references in any absolute manner. Taking set texts into examinations is also problematic at the moment with e-books.

Using Multiple Learning Resources

Academic study often requires the student to have several resources open at once and here there are difficulties with e-books. Switching from one e-book to another effortlessly is vital but many e-book readers require one book to be closed before another can be opened. Annotation over several e-books requires the student to go outside of the e-books themselves and use, for example, a separate word processing package. From our current study we do not see any developments in the market to address this issue.

Collaborative/Group Learning

Once in digital format, learning resources can be relatively easily accessed on a range of devices. As part of our project we had available a pool of iPads[®] for group usage but students in addition made use of their own devices – such as smartphones and laptops. However, one device per person was not necessary; during the project several group activities were carried out and depending on the particular activity up to 4 people could work with a single iPad[®].

E-book Production

The Open University produces a large number of bespoke e-books for its modules. However, with the availability of relatively simple and cheap software for e-book creation, e-books can be produced by individual Associate Lecturers allowing them to assemble their teaching materials into a single package for their students. During the project we have experimented with a number of e-book creation packages both for PCs and iPad[®] apps.

CASE STUDY: COLLABORATIVELY CREATED SITUATED LEARNING

Whenever a new tool or technology comes along there is the potential for disruption to the existing order. This disruption comes in two forms: new tools can enable us to do the same things but in different ways, but they can also enable us to do different things. Mobile learning on field trips is a prime example; e.g. in geosciences mobile technology enables collection of geo-referenced data and immediate analysis and visualization in situ (Beddall-Hill and Raper, 2010).

A number of activities emerged in the course of the project but the highlight was through the work of a small group of ALs who devised and implemented an innovative blended learning activity. This comprised a group of students and tutors using wi-fi enabled iPads[®] walking around a small town working in pairs and making use of pre-loaded material on the iPads[®], wi-fi for web access, and collaborative online forum work along with a bespoke e-book created by the ALs themselves for this activity. The whole process was filmed as it happened and will be the subject of a future multi-media report. This single activity was a result of the tutors themselves having made the transition from novice to expert and in the course of the activity the students also encountered the first five key use case aspects.

The aim of the activity was to summarise the multiple strands of one of the Open University's core foundation Arts modules to aid the students' understanding and appreciation of the whole sweep of the module. The module required 600 hours of student work over a 9 month period. The ALs identified a core set of ideas from the module and they created their own e-book using Sigil, a free open source package although they had also experimented with a number of e-book creator apps on the iPad[®]. They structured a 'walking tour' around the town which had been used as the location of a popular TV drama series – familiar to most of the participants. The students worked in pairs using the iPads[®] as readers for the bespoke e-book and as a link to the internet, to both collect more information and to engage with an online forum to share ideas – created for the activity and accessible to all of the students on the module and not just those who participated on the day. As the group moved around the town – stopping at key points to view the e-book and to discuss the various issues, they had internet access through the use of mi-fi devices – small mobile devices that act as wi-fi hotspots as well as wi-fi connectivity available from cafes and so on. This single event shows the synergy achievable through the use of quickly produced e-books used in situ with internet connectivity to create a rich and relevant learning

environment. One of the products from the project is to feed these experiences back to module teams to inform their thinking for future modules.

CONCLUSIONS

We have produced a considerable resource of data about academics' use of iPads® spanning the period from their being novice users through to becoming sophisticated users of e-books and iPads®. We have identified a number of issues that still need to be addressed by the e-book industry and a number of issues which academic e-book producers need to be aware of when designing e-books. However, we have shown that when combined synergistically, the functionality, portability and comprehensiveness of resources offered by e-books, internet access and mobile group learning, together facilitate rich learning experiences for students. Warren (2009) predicted that the future of e-books would be in more interactive formats that would include hyperlinks and multimedia assets; he also claimed that the authors of e-books would be likely to "explore collaborative models, seeking input on their creative process, allowing others to remix or re-use their work, and teaming up with other authors or fans to create new content" (*op cit.*, p.91). Our findings about academics' experiments with e-book creation suggest that this may well be the direction of future developments.

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