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Educational Use Cases from a Shared Exploration of e-Books and iPads

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Abstract
E-books and e-book readers are becoming increasingly widely available, particularly for the general reader, and there have been many studies on their adoption. However, less is known about their use for educational and academic purposes. We report here on work carried out on e-books and e-book applications using iPads by academic and teaching staff. After considering pedagogical issues and reporting survey results, we identify a spiral of six key use case areas for e-books. This spiral of use cases moves from basic e-book use, through situational reading, e-books and learning, using multiple learning resources, collaborative/group learning, to e-book production. We discuss each of these use case areas and provide guidelines that will be of interest to practitioners and researchers alike.

Keywords: e-books, collaborative learning, situated learning, academic staff development, distance education

Introduction
Despite the growing popularity of e-books and e-book readers, and the perceived value of e-books as relatively low-cost, easily accessible resources in education, a compelling pedagogical rationale and methodology for the adoption of these technologies is yet to be articulated in relation to contemporary teaching philosophies and practices. Occasional published evidence that students still prefer print texts for learning (Shepperd, Grace, & Koch, 2008; Woody, Daniel, & Baker, 2010) casts doubt on the advisability of e-book use in
education, even though such evidence may be derived from limited and context-specific samples. It has also been noted that e-textbooks specifically have not received sufficient attention in terms of making them readable on various devices, which creates barriers to access, and furthermore, that the interactive and multimedia elements of more advanced formats are considered by some as nothing more than an unwelcome distraction (Volkov, 2012).

An underlying weakness of e-book adoption or implementation strategies could be attempts to offer e-books in place of printed books without rethinking the educational practices which underpin the use of these resources. Such educational practices concern students and teachers, as well as the institutional and external systems which support, or fail to support, the changing nature of teaching and learning materials, how they are developed, appropriated and used. It is no simple matter to understand and influence these evolving practices, however our experience creating small communities of academic staff (faculty) with the explicit purpose of collectively exploring new mobile technologies for teaching and learning has in the past proved effective (Kukulska-Hulme & Pettitt, 2008).

In this chapter we look at how innovative learning can be achieved through a shared exploration of e-books and iPads among a group of academic staff 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. Apple’s iPads are acknowledged to be a popular colour tablet device, used for many purposes including commonly as an e-book reader. 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. 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 leisure activities and workflow productivity issues.

The chapter will serve to inform others who wish to incorporate the use of e-books and tablet computers in their own learning activities. In addition, the project has created a rich source of data detailing the evolution of the Academic’s understanding and use of e-books and tablets, including the causes of reluctant participation by some academic staff. This will help others as they introduce these tools to their own faculty. We identify 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. Throughout this chapter we have used the phrase ‘e-book reader’ to encompass both a dedicated hardware device and a software reading application on a device such as an iPad; where a distinction is required, it is developed in the text.

**Background and Literature**

The project has built on existing expertise in pedagogical and usability evaluations of e-book use and other research in mobile learning in the Institute of Educational Technology (e.g. Kukulska-Hulme, 2005; Kukulska-Hulme & Pettit, 2009; Kukulska-Hulme et al., 2011; Twining et al., 2005; Waycott & Kukulska-Hulme, 2003), alongside technological innovation expertise from the university’s Knowledge Media Institute, and the Learning and Teaching Solutions unit where new learning systems are developed and supported. Our previous research indicated that e-books on portable devices fit in well with the lifestyle needs of distance education students, who often combine work with study and may have to share desktop computers with other members of the family. The research established that reading e-books and academic papers on personal mobile devices is already a popular activity among Masters level students in some parts of the world (Kukulska-Hulme et al., 2011). Distance education students were also the focus of research carried out by Nie, Armellini, Witthaus
and Barklamb (2011), who found that work-based distance education students appreciated the flexibility and improved use of available time that e-books offered them.

Studies on e-book use in education have largely focused on students’ views and students’ use of the technology (Cutshall, Mollick, & Bland, 2009; Woody, Daniel, & Baker, 2010; Foasberg, 2011), and consequently there is a lack of data concerning educators’ experiences with e-book readers and e-books. Some studies have published the outcomes of research on educators’ perspectives, but these perspectives chiefly amount to opinions about advantages and disadvantages (e.g. Jamali, Nicholas, & Rowlands, 2009; Bierman, Ortega, & Rupp-Serrano, 2010), rather than being based on accounts of hands-on experience. While students’ experiences deliver important insights, they need to be complemented by the experiences of teachers. The success of any educational technology depends in part on how its use fits in with the overall design of a programme of study and the educational goals of learning activities that employ the technology. If teachers are distanced from learners because they have little or no experience of the e-books and e-book readers learners are increasingly using, the whole educational enterprise is at risk.

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. As has been argued elsewhere by Kukulska-Hulme (2012), faculty engagement with mobile technologies should go beyond adoption in teaching to adoption in their own professional learning. In her work with distance educators wishing to become more proficient in online teaching, Powell (2010) has used a similar tactic of putting each faculty member in the position of online student, giving them some direct experience of using the online medium for personally relevant learning.
The use of e-books in teaching and learning is positioned at the intersection of mobile learning, multimedia learning, and the movement towards open educational resources. Pedagogies associated with mobile learning, and by implication with e-book use on mobile devices, typically centre on the learner’s active role and his/her value as a distinctive kind of node in a labile network of people, places and resources (see Pachler, Bachmair, Cook, & Kress, 2010). Aspects of this are reflected in descriptors such as connectivism, collaborative learning, situated learning, inquiry learning, self-directed learning, resource-based learning, disruptive learning and ubiquitous learning. Weller has recently written about ‘a pedagogy of abundance’ (Weller, 2011), where proliferation of easily accessible content leads to new economic models which have abundance as an assumption. Collections of e-books, some of which may be learner-generated, can fit into this vision of abundance but must also face the challenges that such abundance inevitably creates.

From the educator’s point of view, there is also a need to describe the activity of generating new educational designs and selecting or authoring new types of learning materials that will be accessed on mobile devices. The IMPALA project coined the term ‘podagogy’ to denote ‘the art or science of using podcasts for educational purposes’ (IMPALA, 2006), in recognition of the fact that a new type of content required new thinking and expertise around the creation and use of such content. Similarly, the proliferation of increasingly interactive e-books and e-book collections calls for an examination of their evolving pedagogical purposes. We propose that e-books may be conceptualized in several different ways:

- as stand-alone resources to be consulted by individual learners, for convenience or for reasons of preference;
- as part of an ecology or abundance of resources;
- as a bridge between informal and formal learning;
• 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;
• as part of an emerging industry of self-publishing and disaggregated content

Interaction with e-books involves new skills and literacies encompassing gesture-based interaction, annotating, collating, tagging, exporting notes, and so on; as well as working with multiple e-books in varied formats from different providers. Accessibility and usability challenges exist in this medium as in many others; for example, a study by Kang, Wang and Lin (2009) reported that reading an e-book causes significantly higher eye fatigue than reading a conventional book. Even before an e-book can be read and used, the learner engages with the technical process of selecting, downloading and opening e-books, which currently presents some barriers. It is recognized that “…there are significant challenges in the technology itself and the approaches needed in the pre-reading process; these will need to be overcome before users will adopt [e-book] technology.” (Lam, Lam, & McNaught, 2010).

Interaction with a tablet device, such as the iPad, presents an additional layer of challenge to those who are not completely familiar with its features and the effects of various gestures. The next section details our method of working with the academic staff involved in our project and presents their experiences with using interactive e-books on iPads.

Evaluating Associate Lecturer Perspectives

In reporting our evaluation of Associate Lecturer (AL) perspectives, we are able to draw on survey results, 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.

The method of gathering data and enabling collaboration between the ALs was chosen because it was already familiar to all of them. Many Open University modules use AL moderated student forums and wikis as teaching and learning aids so these online tools needed no introduction and the ALs were comfortable using them, though some were more regular users than others. Some Open University modules use blogs as a way of encouraging reflective learning. Therefore giving each AL a private blog, only visible to themselves and the project leaders, was a useful contrast to the group forum where idea exchanging took place. When the first survey data was collated, responses were compared with what had been recorded in the blogs and the forum to clarify some of the points made in the survey. Survey results were made anonymous for reporting within the university; however the ALs were able to recognise themselves and sometimes each other in the data when they discussed the results at a focus group meeting. This resulted in further reflective learning, exchange and development of ideas of how to use e-books for teaching and learning. Another online questionnaire completed the study, summing up their experiences of using e-books for learning and teaching.

iPads were distributed to 12 of our ALs covering a range of academic disciplines. In the context of The Open University, a distance learning institution, the Associate Lecturers are academic tutors who support student learning directly by guiding students through their module activities, animating discussion forums, giving feedback and contributing to assessment, amongst other duties. The ALs have worked together to develop and evolve an understanding of how e-books, e-book readers and tablet computers can be used to enhance their own and their students’ learning. The project has also identified challenges to the wider use of these technologies.
In July 2011 the ALs were asked to complete an online questionnaire about their first 3 months of using the iPad. In addition, their blogs and the forum were monitored, and provided some detail to their questionnaire responses. The ALs came from the following faculties at the University:

- Arts Faculty (A1, A2)
- Social Science Faculty (D1, D2)
- Faculty of Education and Language Studies (E1, E2)
- Mathematics, Computing and Technology Faculty (M1, M2, M3, M4)
- Science Faculty (S1, S2)

**Key Early Survey Findings Relating to e-Books**

The most used source of e-book content was the Apple iBooks store, followed by online commercial sellers. Two ALs had downloaded OU e-books. Some ALs were very happy with the iBooks application, some were satisfied with it and two had downloaded and preferred alternative applications for e-book reading. ALs had used the iPad as e-book reader for personal reading at home, travelling or on holiday. Some had used it as a research tool whilst on location in a library and in preparation for module production or teaching; some of this involved e-book reading.

At this early stage in the project a few ALs had introduced e-books to their students in tutorials by showing them e-books and module materials on the iPad and held discussions with their students about potential uses for learning. Because the e-book applications have minimal annotation functionality, several ALs had downloaded apps to enable them to annotate PDFs, e-books and other documents.

**Key Early Survey Findings Relating to iPads**

The most popular locations for using the iPad were at home, whilst travelling, and in a cafe. One AL had used the iPad as a marking tool at an OU marking co-ordination meeting.
Most had used it for work email (nine used it for private email too); searching/browsing the internet, accessing OU module websites/materials and using downloaded apps. The BBC iPlayer app was mentioned by several ALs as an application they used the most. Their families were using the iPad as well, mainly for games, homework, searching the internet, photographic display and listening to audio books (whilst doing home decorating).

ALs identified that the biggest benefit of the iPad was the portability and mobility of the device, the ability to share with small groups of others, the aid to marking assignments, new ways of doing things such as note taking, and the internet connection (when wifi was available). However some had experienced slow or interrupted internet connection on their iPad, with some having difficulty with wifi connectivity and synchronising the iPad with their computer, and one had given up synchronising at all. Most of the ALs wanted the iPad to have Flash and 3G. One AL all but gave up using the iPad as it was not compatible with Java programming (her teaching subject). The lack of set up instructions was problematic, especially for those more familiar with PC rather than Apple devices.

At this early stage in the study, four ALs considered that the iPad had a positive effect on their teaching practice, with the others being neutral – some had managed to find effective ways of using it as a teaching aid, while others were unsure. They were split about equally regarding whether it was a time saving or time wasting device; some felt that it was bound to be time consuming learning to use a new device, so they did not view this as time lost.

**ALs Surveying the Students**

One Associate Lecturer took the initiative to create a short online survey which several of the ALs circulated to their tutor groups. This impromptu survey was conducted twice, 10 months apart, with different groups of students. It explored actual student use and experience of e-books and e-book readers for academic purposes. Between the two surveys
there was a big international marketing campaign which resulted in millions of Kindle readers being purchased; this was reflected in the second survey where the percentage of students owning an e-Reader device jumped significantly, though this may also have been influenced by more students from the Computing and Technology category participating than in the first, which was dominated by Arts students. There was also a rise in the number expecting to have a device by the following year.

When asked what advantages they could foresee in having OU materials accessible through an e-book reader, portability and ease of access were seen as the greatest advantages:

“I didn’t need to carry so many books ... all in one little thin pad, otherwise I prefer normal books” (Student Survey 1)

“I travel a lot for work ... ideal opportunity to study ... downloaded the course material as pdf ... Not quite as convenient as e-books” (Student Survey 1)

“... latest course ... materials ... only available as web-pages ... would be much easier to read on an e-book reader ... down side ... Kindle does not support re-production of colour images” (Student Survey 2)

“E-Readers ... much easier to carry round a large amount of course materials ... much easier to search course and research materials” (Student Survey 2)

“... advantages ... a digital back-up of study materials ... being able to adjust the setting of eBook Readers ... preference of font size, brightness, etc” (Student Survey 2)

Some students were not entirely convinced of the benefit of downloading electronic course materials to a portable device, especially if they had heard mixed reviews of their usability; indeed by the second survey views seemed more polarized, and there was a very slight increase in the percentage of students wishing to continue receiving hard-copy of module materials:
“... have only used the course book PDFs [on a PC] ... invaluable for ... search facility ...

type size on e-book readers is not great ... have eyesight problems so have avoided them.” (Student Survey 1)

“I can’t! ... screens are too small ... with paper books ... can take notes in margins.”

(Student Survey 1)

“... e-Readers ... advantage for additional material ... if students could choose e-books
instead of printed materials as a cheaper course version ... much prefer book versions
at least for core texts, to touch, annotate, draw on ... They also don't give me
headaches” (Student Survey 2)

“... option ... to learn from both study materials ... like to highlight key phrases ... cannot
concentrate for long periods ... on the e-reader ... therefore ... course books would be
beneficial” (Student Survey 2)

“... use my kindle a lot ... have emailed ... OU pdf files to it ... downloaded several set books
... would welcome e-reader versions of course books & readers” (Student Survey 2)

“... not my reading material of choice ... prefer books ... like flicking ... pages, referencing
several sections at the same time ... having them all available to view” (Student Survey 2)

“... find the tangible quality of books preferable ... but enjoy the scope, variety of material
and immediacy that e-Readers provide” (Student Survey 2)

Some of the ALs held discussions in their tutorials with students about the potential advantages of using e-book readers and e-books for studying and in one such discussion revealed that the transience and potential for losing data with electronic devices was a significant barrier to student willingness to adopt e-books for their studies:
“Paper books can be carried around with pride, - when they arrive I feel motivated to study, the feel and smell of a book creates memories” (Science student discussion, reported by S1)

“There was also a concern expressed in the discussion about things that could go wrong – for example having to re-download a book and finding any notes they had made being lost, the device being lost, broken or stolen and so they lost everything.” (Science student discussion, reported by S1)

Another AL (A1) reported that Kindle users in her tutor group used their e-book readers to “dip into the book quickly whilst on a commute or at work in more privacy than a paper book allowed” with “more structured study” taking place at home where they made notes on paper rather than annotating the e-book; she described their use of the e-reader as a “stand alone book rather than an integrated study tool”. A third AL (M1) reported that even her technology students who used a variety of mobile devices in their every day lives preferred print material for studying, with one printing out the online-only materials for studying.

Use Cases

Our project has identified six key aspects to be considered for e-book use in academic and non-academic use. The order of these six aspects as listed below is that of a widening spiral moving from the intrinsic features of e-books and e-book readers, to looking at their advantages and disadvantages for reading. We then consider issues around learning using a single device/resource followed by the issues around learning using multiple resources. The spiral then moves away from the individual learner to collaborative learning. We finish by considering the role of the academic in producing their own e-books.

- Basic e-Book Use
- Situational Reading
• e-Book and Learning
• Using Multiple Learning Resources
• Collaborative/Group Learning
• e-Book Production

![Figure 1](image)

**E-book use cases forming a spiral**

**Basic e-Book Use**

The key selling point made for the majority of e-book readers is their ability to hold large numbers of books without the inconvenience of bulk and weight. However, for our purposes we are much more interested in features related to reading and in particular academic reading. Below we consider some of the key intrinsic features of e-books from this point of view.
The new affordances offered by e-book readers were some of the most important aspects of e-book use. Features such as the ability to re-size text and to read in subdued lighting were not only convenient but have important accessibility issues. Most e-book readers offer the simple facility to change the size of the font; many tablets also have the ability to zoom documents e.g. PDFs

“Beyond this, however, I do feel that the iPad's excellent image display capabilities - and especially the 'zoom' facility ...” (A2)

“You needed to zoom to read it comfortably so if the OU were expecting people to read in this way routinely they'd need to put less on each page so you could still see a whole page when zoomed. (M2)

However, this zoom feature can be the source of irritation and inconvenience when the authors do not take the need for zooming into consideration.

“As an eReader I've been using the iPad to read the course texts for block 1 & 2 of TU100. Each page has to be enlarged slightly to read comfortably and then either flicked to turn the page or shrunk back so you can tap the corner. Either is a nuisance and when you get to the next page you are back to the old level of magnification.” (M2)

Related to this is the common feature of being able to adjust the brightness of the screen – again a valuable accessibility feature.

An important feature for academic use is that many e-book readers allow not only text searching through a book but also a dictionary to look up word definitions.

“I have started to enjoy some advantages that can be gained from having module set books available .... Perhaps the most significant of these, so far, is the 'Search' facility, providing the opportunity to find specific words/phrases very quickly and efficiently.” (A2)

“Searching - very easy indeed, almost no need for an index” (D1)
“I found that the e-books Search function works well for individual words. E.g. I was able to confirm that in ASH, Holmes says "my dear Watson" 5 times (and find the references immediately); "Elementary" once, but never says "Elementary, my dear Watson".”

(E2)

Related to the search feature were annotation and highlighting features, although exporting and sharing was sometimes problematic.

“I am also beginning to develop the habit of bookmarking specific pages, as well as highlighting key words and creating on-text 'Notes'” (A2)

“I am gradually transferring on to the iPad pdf copies of all the course/module material I teach, and then going through highlighting and making notes on the content. This is so searchable, so collectable and so easy to organise compared to any other method of highlighting and noting that I have ever tried.” (D1)

Problems that became apparent were:

“I did email just the annotations to myself and with a bit of tidying up that will produce a set of fairly respectable notes but I'm not convinced it wouldn't have been as fast to print out the papers and attack them with a highlighter, then type up notes afterwards.”

(M2)

“My first response was that although it is possible to annotate e-books, there is not the same range of possibilities or flexibility that I find with print. My print annotations included highlighting, underlining, colours, bracketing, notes in margins and inside front and back covers. I didn't find this as easy with e-books.” (E2)

“Also I couldn't reproduce the musical notes and staff so couldn't always make the notes that I wanted to! I also tried making my notes in Pages but didn't find that any better - took up too much time and couldn't always write in the form I wanted too. Have now abandoned this in favour of writing notes by hand (on paper) as this is much quicker,
easier to use my own words and also the only satisfactory way I have found of writing music. (It occurs to me that students of maths and science are going to find making notes on the iPad quite fiddly for this reason).” (S1)

Another common feature is the ability of e-book readers to remember the last page you were at on all of the books that you have opened in the device’s library. Many also have simple bookmarking facilities.

An interesting response was:

“... but emailing the annotations to myself is less successful as I tend to underline key words rather than writing a lot of notes and they don't make a great deal of sense in isolation. I still find it disconcerting that you can't feel the weight of print still to read in order to pace yourself. I'm saving a lot on printing and in theory could pick the work up anywhere more easily, but in practice, because the books aren't sitting there staring at me it's all too easy to fall behind!” (M2)

On a higher level, organising of e-book collections could be problematic. Individual e-book readers provide simple organisation often through a book shelf type metaphor, but organising e-books read in different readers was not possible and collating annotations from several sources was difficult without the use of other software.

“Having already put three of the set texts into a new iBooks 'Collection' (a useful storage method), I was pleased to discover that downloading the first Module book allowed me to put copies into both PDF Expert and iBooks.” (A2)

Where enabled by the e-book reader, one of the most exciting affordances of e-books was through the possibilities offered by multimedia resources embedded within the e-book. Many readers don’t support these features at the moment but through the use of a device such as the iPad it is possible to have sound and motion embedded into the e-book. So, rather than asking students to stop reading and switch to another device such as a computer screen, audio
device or TV, all of the resources can be in the single e-book. It is also possible to have interactive features within the e-book such as quizzes with links to the answers or links out of the e-book to internet resources. As part of other projects within the Open University there are a wide range of interactive e-books available which incorporate audio, video and interactive features such as self-assessment questions.

**Guidelines for Basic e-Book Use**

We have identified many valuable features of e-books, particularly the ability to resize text and in some cases to zoom in on text and images. However, authors need to be aware of the limitations of such features if they are needed constantly and the wide range of devices available makes it difficult to anticipate how they will be used. This is particularly true when authors wish to include multimedia features and in some case even colour will not be rendered on some devices. However, authors should be very alert to the motivating potential of including multimedia elements into their e-books.

The basic search facility offered by most e-books was seen to be very valuable and to a large extent replaces the need for authors to create detailed indexes although the search facilities did not cover concepts as opposed to just simple word matching. This suggests that certainly for academic texts there is still a need for index creation.

In a similar vein, many e-books provide simple bookmarking and some form of annotation. However, this is often far less sophisticated than many people would like to use for academic purposes. So authors and particularly educators need to appreciate that students will still need to make notes, possibly using other packages or on paper.

**Situational Reading**

The general findings of the project were that e-books can be read in most of the situations in which traditional books can be used. However, there were differences on both
sides. Electrical devices tended not to be used near water, whereas as mentioned earlier, reading under subdued lighting was possible with most e-book readers.

The most often mentioned value of e-book readers was their ability to hold large numbers of books with no additional weight.

“I was able to appreciate that a big advantage of e-books is their portability. I don't mind carrying a single printed volume around (no more inconvenient than an e-book reader). But I could carry round hundreds of e-books without any increase in bulk.” (E2)

This portability then encourages use in a wide range of situations.

“... Without even thinking today I popped it in my bag 'because I wanted something to read on the train'!” (A1)

“I did take it on holiday and did my favourite of sitting outside in the twilight to read a book.” (A1)

“...especially on holiday (including a French campsite and bed and breakfasts in the UK)” (S2)

However, some were not happy to use it on some occasions.

“The iPad's place at night I've decided is on-charge. It's not soft and cuddly enough to want to use it to read a novel and I'm not ditching the paperbacks for it” (M2)

Most use of e-books focuses on reading books previously downloaded onto a device. However, in our increasingly connected world there are many opportunities for e-books to be downloaded on the move.

“Well the wi fi on the train wasn't as generous as hoped only half an hour free. But I did manage to download two OU course units. Dr. Faustus and Approaching Poetry, both useful for teaching. Especially the Faustus book which has the full play text embedded within it” (A1)
“I have been downloading books from Gutenburg and am so impressed by the stuff available. ... I've always wanted to read all of his stuff but again, impossible as it has been out of print. They even have all the volumes of his Arabian Nights... Lots to keep me amused.” (A1)

And there are opportunities to download spontaneously, as a need arises.

“At the end of August I had a canal holiday ... and since this was a new area to me - Birmingham rather than the canals of the NW or further south - I decided to read up on them. I looked around for suitable sources and found that Birmingham City Council offer a book in ePub free of charge from their website.” (M4)

**Guidelines for Situational Reading**

Portability is the key message here. Texts are easily transported and read irrespective of their size and weight. Internet access also allows for just in time downloading and use. For academic use in particular this is an unalloyed advantage of e-books. Academic texts tend to be heavy and unwieldy but as e-books they can be the size of a standard paperback book. So all other things being equal, a move to e-books is to be recommended.

**e-Books and Learning**

After looking at some of the basic features of e-books and their general use, we now consider their use specifically as learning resources. Whilst there has been widespread acceptance of e-books for the general consumer, there is some resistance to their use for academic purposes. The experience described below shows that with purpose made e-books there are real strengths in the technology but that there are problems inherent in the devices, particularly around annotation and sharing. These issues have been mentioned above and will be more fully explored in later sections.

At the Open University we have produced a great number (in excess of 400) of e-books based around our modules and these make use of interactive features and multimedia.
These resources are increasingly being provided for module use. Students can make simple notes and use highlighting within the e-books themselves and there is a book marking system. The particular value of these e-books is that they encapsulate all of the resources needed to study the module on a single device and hence allow students to access the materials in a wide variety of locations and on a wide range of devices including mobile phones. All of the points made earlier about features of e-books and situational use can be made in relation to learning as well.

An early issue for academic work which has been identified is the lack of page numbers for referencing purposes. Much of academic work requires the specific identification of the location of quotations and so on. With different aspect ratios, font types and sizes, e-books do not allow for page number referencing. A further academic issue for some modules/courses is that a student may work on an e-book throughout their course and then not be able to take the text into an exam when paper-based books are allowed.

**Guidelines for e-Books and Learning**

For simple access to content, the e-book approach has much to recommend it. By carefully constructing e-books they can incorporate all of the resources needed by the student in one package. However, beyond this there can be difficulties. For academic purposes all e-books whether ‘off the shelf’ or tailor made need to have sophisticated annotation facilities including the easy export of these notes and annotations to other packages without the need for further extensive editing.

A more substantial issue is the need for referencing quotations especially for assessment and academic writing in general. None of the e-books considered here had a mechanism for easily producing page references in any absolute manner and no progress on this point appears to be on the horizon.
The final point is the use of e-books in controlled examinations. Many modules allow students to use either clean copies of text books or copies annotated to a greater or lesser extent in examinations. However, there is considerable resistance to allowing e-books of any level of functionality into the examination environment.

Figure 2
Individual e-book produced at The Open University

Using Multiple Learning Resources

Within much of the first year university level work of the Open University, module resources are provided for students that contain almost all of the material that the student needs for study and when converted into e-books the result is a very compact and portable resource incorporating, text, audio and video as well as interactive elements. However, when
using multiple e-books from a variety of sources, or with other resources, problems begin to surface.

Whilst using a single e-book/e-book reader is straightforward and has many of the advantages listed above, when it comes to using an e-book with other resources, particularly other e-books, then problems can arise. If all of the resources are encompassed within a single e-book (through the use of multimedia/internet links) then there are no difficulties. However, when using multiple e-books particularly across several e-book readers then considerable difficulties arise even when all of the e-book readers are situated on the same device as is possible through the use of e-book reader apps on the iPad. Difficulties include: switching from one e-book to another, needing to understand and be competent in the various annotating features of each reader, and issues around exporting and collating the notes made. Equally, there is a real need for e-books to be able to import annotations previously created elsewhere.

Quite often:

“The first thing that struck me was when I did this work using hard copy books, I usually had several printed copies open simultaneously.” (E2)

Multiple e-books from multiple sources do not easily lend themselves to resolving this issue. Even when the e-books are being accessed on the same device, there are problems of sharing and collating annotations and these are problems that many providers have not yet addressed, presumably due to the comparatively small number of academic readers when compared to the number of leisure readers.

When engaged in academic reading there are often many activities going on simultaneously: cross referencing, bookmarking, skimming, scanning, reading for detail and annotating:
“My immediate impression was that it is not as easy to "flick" through e-books or jump between pages as easily as with a printed book” (E2)

“My first response was that although it is possible to annotate e-books, there is not the same range of possibilities or flexibility that I find with print. My print annotations included highlighting, underlining, colours, bracketing, notes in margins and inside front and back covers. I didn't find this as easy with e-books.” (E2)

“You can make notes, but it's difficult. Underlining or highlighting with a marker is easier, more natural and more effective. With electronic texts it is difficult to 'scan-read' - very important for a first reading and for revision.” (E2 – quoted from the experience of a student)

And perhaps most tellingly:

"In my opinion, they are very well adapted for reading in a "linear" fashion, e.g. a novel. However, this is rarely what we do when we study.” (E2)

Guidelines for Using Multiple Learning Resources

Individually, there are many attractive features to e-books for learning. The search facilities of most e-books make them very useful for finding information – at least using terms that directly appear in the text. Many also have contents pages that allow the student to jump directly to a particular page and to bookmark that page. There are also often simple annotation and comment making features. However, the key difficulty is in having several e-books open at once. Annotating over several e-books is problematic but usually notes can be combined, in a separate word processing package for example. But much of academic study involves students having several e-books open at once or at least to be able to switch from one to another effortlessly. From this current study we do not see that the market is at this state and any guidelines will need to await further developments in the e-book market.
Collaborative/Group Learning

The traditional view and approach to e-book use has focussed on individual use. What we were keen to explore in our project were the opportunities for groups of learners to work together with e-books.

We were particularly interested in whether and how e-books could be used for group work. With only one device, there were inevitably problems with a number of students trying to see a single screen. However, there were a several occasions where a small number of students were able to beneficially view specific elements of an e-book such as illustrations or multimedia elements. As an example, one AL was able to use an e-book during a tour of an art gallery to show comparative images.

“Calling up pictures of other items can really help a discussion go well ...” (A1)
With only one e-book available, group work was limited to using the device to display images, video or audio elements. When several devices were available, then using free e-books, several learners could gather around each device. This encouraged discussion and when done on a tablet in a wi-fi area, it allowed online work to be carried out at the same time.

**Guidelines for Collaborative/Group Learning**

Beyond using the e-book device as a small display unit to display audio/static images/video images to small groups, collaborative learning requires there to be a number of devices available, but not necessarily one per person. The advantages of using e-books over print based books in these situations is seen when interactive elements are incorporated. In particular, bespoke e-books can contain links to, for example, online forums where students can interact with each other in real time. The Open University also has a web based tool called Annotate that allows for the sharing of comments, tags and bookmarks on websites. Tools such as this can more fully realise the potential of collaborative/group learning using e-books. These more advanced features are of course device dependent with many dedicated e-book readers not able to make use of e.g. linking out to web based forums.

**e-Book Production**

One of the surprising developments from the project was the creation of e-books by the academics themselves. Through various ‘apps’ and other software it is increasingly easy to produce simple e-books using one of the widely used ePUB formats which can include sound and video resources. This aspect of the work is still in its early stages but has been used by two of the academics for their field trip work – allowing students to have access to relevant resources whilst carrying out field work. The academics produced their own resources and then bundled them together as an e-book. There are limits to the range of
features that can be incorporated in these simple packages, nevertheless there is clear potential.

**Guidelines for e-Book Production**

The issue of bespoke e-books has been touched upon earlier. In that context the idea was that a publisher or a module team would produce e-books for large numbers of students covering a substantial portion of a module’s materials. However, the availability of relatively simple and cheap software for e-book creation means that this ability can be brought down the production chain, to the level of the individual AL. This allows for ALs to package their materials in an e-book format for their own students with all of the attendant advantages of the e-book format. General purpose devices such as the iPad have apps which allow e-books to be produced on the device itself. However, there are also straightforward routes to self publication through various book sellers’ systems.

**Doing Things Differently and Doing Different Things**

Whenever a new tool or technology comes along there is the potential for disruption to the existing order. E-books are disruptive in many ways. At the simplest level they are re-making the entire publishing industry. For our project we were interested in the disruption caused to the arena of education. This disruption comes in two forms: e-books can enable us to do the same things but in different ways, but they can also enable us to do different things – things that we were not able to easily do before they arrived or even do at all.

ALs have seen that e-books allow them to continue to carry many texts but without the weight traditionally associated with academic texts. They can add bookmarks, annotate and add comments just as they have always done with pencils in the margins. However, with e-books they can zoom in on images and re-size text, they can rapidly search the whole of a text. Their annotations and comments can be relatively easily shared with a wide circle of colleagues through a simple email.
Through careful construction, e-books can incorporate all of the resources needed by the student in one package. This type of artefact goes further than simply being the equivalent of giving a student a book, a DVD and a computer simulation package, since an e-book with these elements forms a seamless blend of learning resources with all of the elements integrated at the appropriate point in the students’ learning journey. The student does not have to stop reading to switch on their DVD player to watch the first few minutes of a film before having to open their book again and then returning to the DVD player before starting their computer to run a simulation package – instead, with an e-book all of these elements are in the same place and the student is able to move naturally from one to the other.

Using e-books in group situations can be the equivalent of using paper based books. Each student has their own copy and uses it in a traditional group fashion, perhaps reading a short section and then discussing with those around them. This is followed by reading some more, perhaps making their own notes as they go along. However, now imagine the same scene using e-books containing external links and in particular links to an online module forum; now the class can include those not present in the room and even those not present at that particular time. Comments can be left on the forum as the students interact with the text both synchronously and asynchronously collectively making sense (and notes) of the text.

Lecturers have always produced their own notes, or their students have done so, in more or less sophisticated ways. In one sense, lecturer produced e-books are just the same, except that they can now contain audio and video material, interactive elements and links to external websites and by using standard formats these can be made available for a wide range of reading devices.

Conclusions

For The Open University as a distance education institution, the starting point for an e-book pedagogy is to identify and analyze the range of scenarios of use, since these will
comprise e-book use in tutorials, at day schools, in outdoor activities, in the home, at work, and during periods of movement and travel (in UK and abroad). This requires close work with representative groups of ALs and students. Second, it is important to observe interactions between portable devices (such as the iPad) and other technologies available to students, for example the use of interactive e-books in conjunction with a desktop PC, print resources and a mobile phone, hence the initial impetus for this project.

E-books have a tremendous potential especially when full advantage is taken of the digital nature of the medium to incorporate multimedia and interactive elements to enhance the student learning experience. Such features require more sophisticated e-book readers but enable educators to structure and deliver a learning experience far richer than any possible through a paper based system. In 2009, Warren wrote that the majority of e-books are simply digitized versions of print books, mimicking what students and researchers have traditionally done with printed texts. Based on a review of three innovative e-book models, he predicted that the future of e-books would be in more interactive formats that would include hyperlinks and multimedia assets. Furthermore, he drew attention to the authors of e-books, who 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.

However, there are currently important problems around the use of e-books for academic purposes. Individual e-books often stand isolated from other e-books especially if on a different e-book reader. But also, in many cases even when e-books are on the same reader, it is impossible to have several e-books open and viewable at the same time for study. Making and collating digital annotations and notes can also be challenging. For academic purposes the difficulties in producing definitive page references is a serious issue. All of
these issues will probably have to await a common format across all e-books along with tools for manipulating multiple resources including annotation and collation of notes.

Many of these problems can be alleviated by bundling resources together to create a seamless learning experience. The Open University currently creates a wide range of such e-books. However, one of the downsides to this is that students may be tempted to stay in the ‘walled garden’ that has been provided for them and be less inclined to venture further afield. This project is part of a wider effort by The Open University and future work will concentrate more directly on the student experience of using e-books.

References


