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Why doesn't everyone love reading e-books?

Why do many students still prefer paper books to e-books? This article summarizes a number of problems with e-books mentioned in different studies by students of higher education, but it also discusses some of the unexploited possibilities with e-books. Problems that students experience with e-books include eye strain, distractions, a lack of overview, inadequate navigation features and insufficient annotation and highlighting functionality. They also find it unnecessarily complicated to download DRM-protected e-books. Some of these problems can be solved by using a more suitable device. For example, a mobile device that can be held in a book-like position reduces eye strain, while a device with a bigger screen provides a better overview of the text. Other problems can be avoided by choosing a more usable reading application. Unfortunately, that is not always possible, since DRM protection entails a restriction of what devices and applications you can choose. Until there is a solution to these problems, I think libraries will need to purchase both print and electronic books, and should always opt for the DRM-free alternative. We should also offer students training on how to find, download and read e-books as well as how to use different devices.

Introduction

Two years ago my colleague Ninna Wiberg and I wrote an article about reading and learning on screen as compared to print.[1] According to the studies we referred to in that article, there was no substantial difference between print and screen when it came to reading comprehension and study results. But there was still a strong preference for print, which I found interesting and wanted to know more about.

Most people are prepared to agree that there are some obvious advantages to e-books. They appreciate that it is easy to carry a lot of e-books, that they are able to change font size and search within the text, and that they have instant access to e-books regardless of time and space. E-books can also easily be updated, and sometimes they contain embedded dictionaries and vocabularies. But, if e-books have all these advantages and reading from screens does not impair study results – why does everyone not prefer e-books?

Many bibliophiles love the object just as much as the written content; they like the feel of the paper as they turn the pages, and, when they have finished the book, they want to put it in their bookcase, which doubles as a showcase of their identity.[2] We know that this kind of emotional attachment to print books can affect the users' attitudes to e-books negatively,[3] but in this article I will try to look beyond the emotional aspects and present some of the more objective difficulties that users, especially students in higher education, experience when they read e-books. I will begin with a discussion of the devices used for reading e-books. Then I will discuss the problems with current e-books regarding usability and user experience. Finally, I will mention some new and innovative e-book features that could make the e-reading experience more attractive, and make a couple of suggestions of what we librarians could do to help our users here and now. This article is based on current research as well as my own observations.

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'Many bibliophiles love the object just as much as the written content'

The kind of device you use matters: eye strain

Many e-book readers report that they suffer from eye strain.[4,5] But here it is important to remember that there is an abundance of different screens and devices, and that screen size and quality have improved in recent years, because the kind of screen you use when you are reading matters.[6] And, since the development of screens is still in progress – there is, for example, a Japanese research team that developed an eye-friendly screen prototype for e-book reading in 2016[7] – it is probable that screens will be even better in the future than those found today.

Aside from screen quality, the angle of inclination is also important when it comes to avoiding eye strain. A German research team has shown that, when you hold your screen in a book-like position (they used iPads in their experiment), the differences in eye strain symptoms between screen and print were eliminated. I think this shows there is a need for more user-friendly ways to read e-books on hand-held devices like tablets or e-book readers in preference to desktop or laptop computers.[8]

> 'the angle of inclination is … important when it comes to avoiding eye strain'

What devices do students use for e-book reading?

In some recent surveys from Finland,[9] Slovenia,[10] the UK[11] and the US,[12] students in higher education were asked what kind of devices they use when they read e-books. The numbers are not entirely comparable, since the question in the Finnish survey was about any kind of e-books, and not specifically e-textbooks as it was in the other three surveys. And the Finnish students could not specify whether they read e-books on a laptop or desktop computer. Despite these discrepancies, I have put the results from all four surveys into the same chart (see Figure 1) to get a better overview of the results.
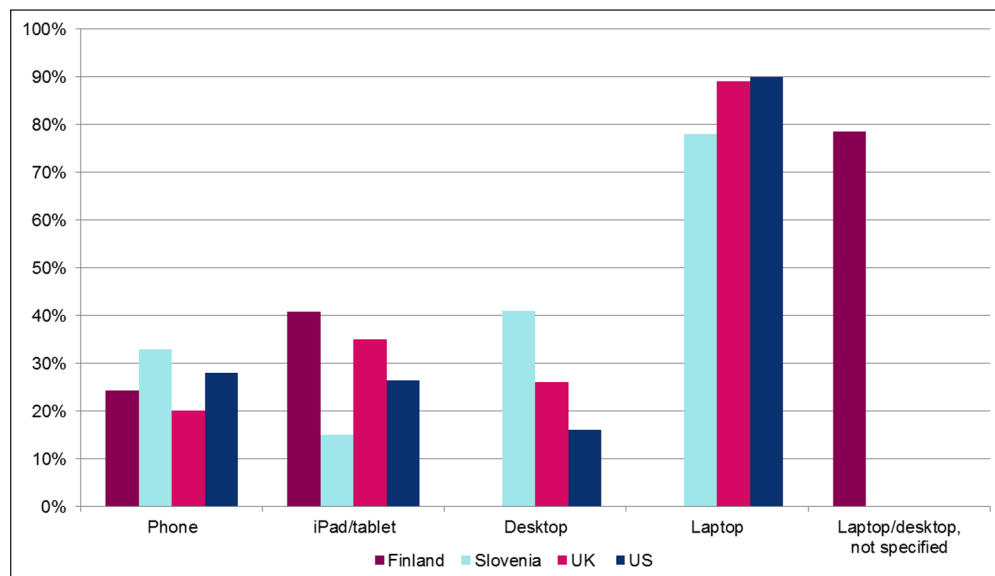

Figure 1. Comparison of devices used by students in Finland, Slovenia, the UK and the US when they read e-books

As we can see in Figure 1, most students read e-books on their computers, usually laptops, but they do not use smartphones and tablets to the same extent.[13,14,15,16] There are some possible reasons why they do not use mobile devices for e-book reading, but the reasons are probably not the same for smartphones and tablets, which I will return to later.

What devices do they own?

Figure 2 shows statistics of the share of the Swedish population of different ages who have access to their own smartphone, computer or tablet.[17]
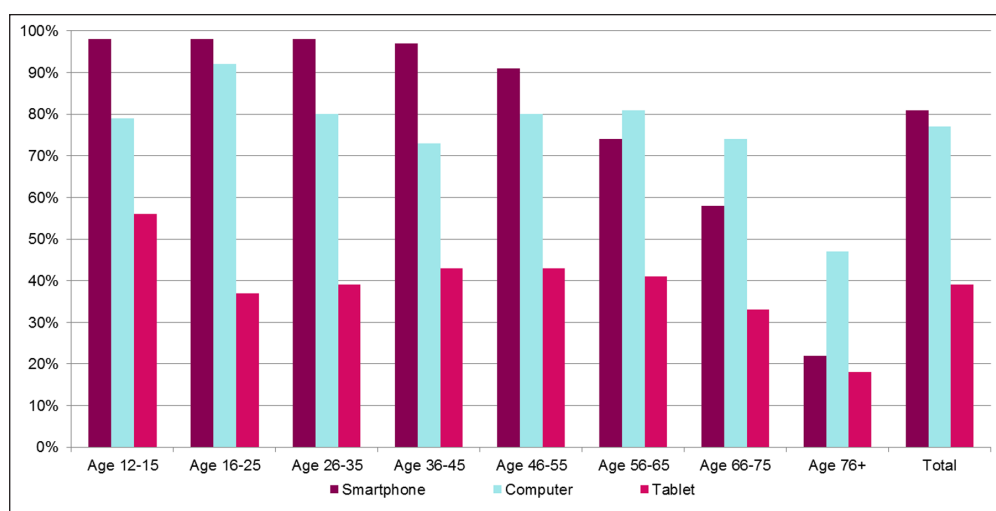
Figure 2. Share of the Swedish population of different ages who have access to a smartphone, their own computer or their own tablet

Almost everyone aged 16 to 35 has a smartphone, but only around 40% own a tablet. This means that the share of the younger Swedish population that owns a tablet is roughly the same as the share of students in our neighbouring country, Finland, who use tablets for e-book reading. I would therefore speculate that most students who actually own a tablet also use it for reading e-books.
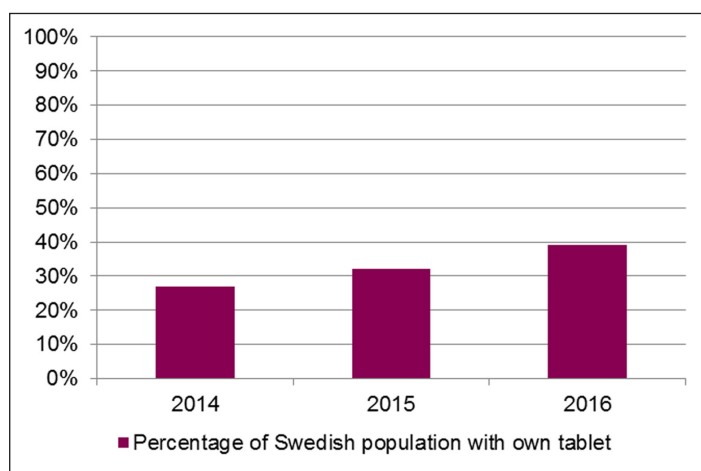

Figure 3. Development of the share of the Swedish population (12+ years) who have their own tablet

Since the proportion of the population that owns a tablet is getting bigger every year, as we can see in Figure 3,[18] I do not think we should neglect the tablet as a reading device. The smartphone, on the other hand, does not seem to be students' first choice, which is probably related to the problems users experience when they read on small screens.

Reading on small screens (3.5-inch) or bigger screens with fixed layout

In a thesis from 2013 about reading on small screens[19] – in which the author used the first-generation iPhone with its 3.5-inch screen – a majority of the comments were complaints about the lack of overview and difficulties in previewing and back-tracking within the text. The study subjects also pointed out that it is harder to browse back to an exact position in the book on a small screen, because then the text is fragmented over several pages. With a more fragmented text also comes a need to turn the pages more often, in this case so often that it was considered a problem. Some participants solved this problem by reducing the font size, while others preferred the bigger font size, since it made the text more legible. And even when the small screen did not have any negative effect on reading comprehension, the participants in this study still preferred a larger screen.

Another study[20] shows that, as long as the text presentation is identical, there are no significant differences between reading print and reading electronic books. It is when the text is fragmented over several screens so there is less content on each screen that text processing is impaired – because, then it is more difficult for the reader to construct a cognitive map of the text structure that usually helps them remember what they are reading. Based on their findings, the authors suggest that the future design of reading devices should follow the codex structure, with a fixed layout, not only because it supports the construction of a cognitive map, but also because then it would be easier for readers who are already familiar with print books to read electronic texts more intuitively.

'when we read e-books, they should be as book-like as possible'

Based on these two studies, we can conclude that, when we read e-books, they should be as book-like as possible, and that we should read them on a screen that can display enough content and still have a font size that is large enough to be legible.

Readability

Aside from the question of whether you should offer the reader a fixed layout, or the ability to adjust the text settings, there are also other design elements that affect readability, such as the choice of type face.

I have found a couple of articles where researchers have used eye-tracking devices to compare the readability of different type faces on screens.[21,22] In both articles, a sans serif typeface was found to be more readable, which means that study subjects read both faster and more accurately than when they read texts on screens with the serif typefaces that are most commonly used in printed books. One of the studies[23] also discovered that reading speeds increased even more when the font size was increased.

'a sans serif typeface was found to be more readable'

But how many vendors offer our users electronic books and articles that are actually designed for electronic use, and are not just an exact copy of the print original?

Usability

When it comes to the usability of e-textbooks, the majority of the students' complaints seem to be related either to the highlighting and annotation functionality or to the overview of the content and the ability to navigate easily within the book.[24,25]

Navigation

The lack of overview when you read a book on a digital device does not only make it hard to jump forwards or backwards in the text, it also gives you poor feedback on the progress you are making as you are reading. And it makes it difficult for you to plan your reading, since there is no easy way for you to see how much there is left of the book or chapter you are reading.

Highlighting and annotating

Students need to actively engage with their texts in order to learn and retain information, and they often use highlighting and annotation to do so. I have found articles from several countries[26,27,28,29,30] in which university students prefer print because of the lack of possibilities for highlighting and annotating when they are reading digital texts.
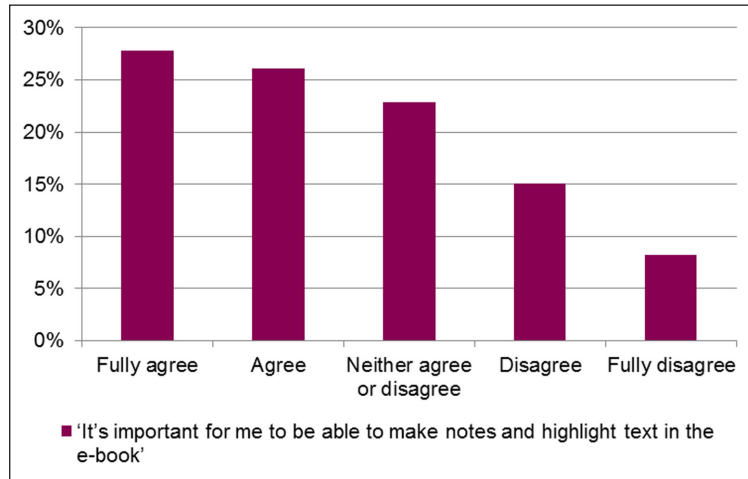

Figure 4. Finnish students' views on the importance of a digital highlighting and annotation feature

In a Finnish survey from 2016,[31] the majority of the students agree that the ability to highlight and annotate in e-books is important (see Figure 4).[32] Since they also want to be able to download their books to their own devices (see Figure 5),[33] I think we can assume that it is necessary for them to be able to highlight and annotate both online and after downloading.
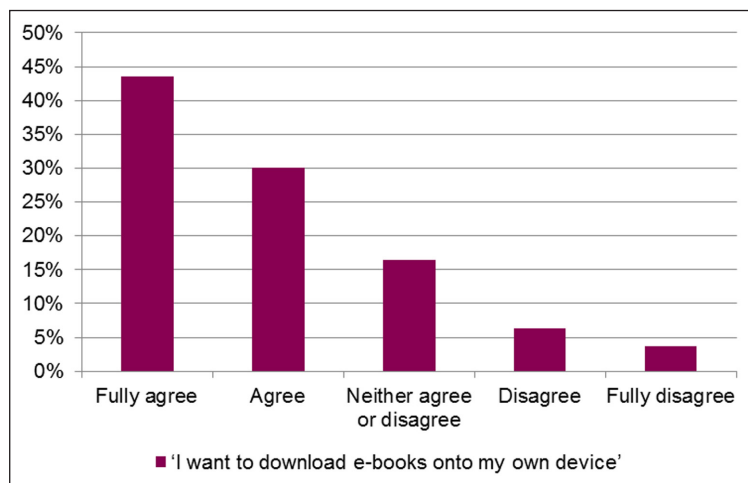

Figure 5. Percentage of Finnish students who would like to be able to download e-books onto their own devices

We know now that students want to be able to highlight and annotate, but how much do they actually use these functionalities?

In a study from 2015,[34] a majority of Portuguese university students disagreed with the statement 'I usually highlight and annotate my electronic readings', while they agreed or strongly agreed with the statement 'I usually highlight and notate my printed course readings' (see Figure 6). And in Figure 7 we can see that the result was similar when the same survey was carried out in the UK last year.[35] In both countries, students usually highlight and annotate more when they read print than when they read electronic texts.[36,37]
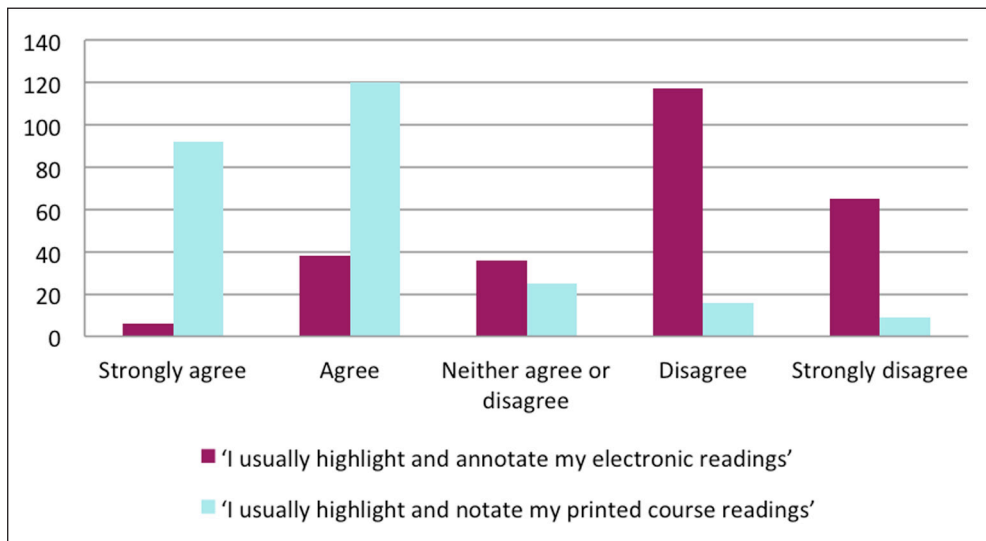

Figure 6. Comparison of the number of students (Portugal, 2015) who highlight and annotate electronic and print reading matter
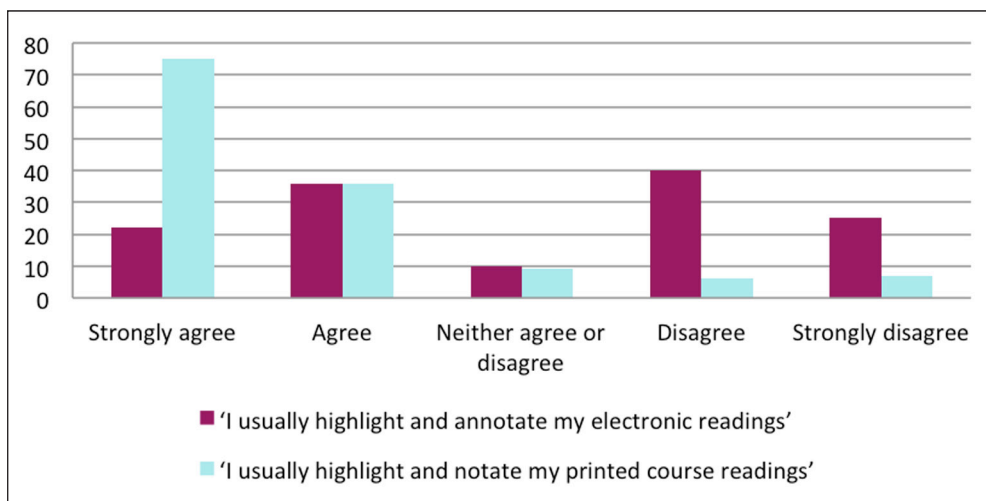

Figure 7. Comparison of the number of students (UK, 2016) who highlight and annotate electronic and print reading matter

The authors of the UK study suggest that students need more training on how to use applications for learning purposes, since they have found that 'there is a perceived greater difficulty associated with highlighting and annotating in electronic formats'.[38] And I think they have a point, since many students are not even aware that they can annotate and highlight in their e-books, but I also think we need to make certain that our e-books actually provide the functionality to annotate and highlight.

Accessibility: DRM

The main issue when it comes to accessibility and e-books is digital rights management (DRM) protection. DRM involves technological restrictions that make it possible to control what users can do with our e-resources.[39]

In the Finnish study from last year,[40] college and university students said that they do not want to have to log in several times or use separate applications in order to borrow e-books. They want to be able to borrow the e-books when they need them and keep them as long as they need to, and they want to be able to download the e-books for offline reading regardless of what device or web browser they are using. In other words, they want to be able to do everything that DRM protection restricts them from doing.

It is probably not reasonable to suggest that all library books should be DRM-free (even if the music industry experienced increased sales when they removed DRM protection).[41] But it is not just easier for the user to download DRM-free e-books – when you download an e-book without DRM you are also free to choose the device and application most suitable for your needs.

As we have seen, the best device for reading e-books is not a computer, but rather a slightly bigger mobile device. But what happens when we try to read an e-book from, for example, Ebook Central, on our tablets?

If you read a book on Ebook Central's online platform in a browser on a mobile device, you will find that you cannot use the touch screen to select text, which in turn makes it impossible to highlight text. And it does not help if you download the book for offline reading to Bluefire Reader (which is the default application), because it is not possible to select text for highlighting there either. But, even if you do manage to open the book in another application with better functionality for highlighting and annotating, as soon as the loan expires, the notes will be gone for good.

If our suppliers are unable to remove the DRM protection from their books, could they not at least have a default reading application that is better suited to our students' needs? Perhaps they could make it possible for the users to get their notes and highlights back when they borrow the book again?

> 'they want to be able to do everything that DRM protection restricts them from doing'

Distractions

Many users admit that they easily get distracted when they read e-books,[42,43] which I think should be possible to remedy even if you are slightly addicted to the dopamine that your brain produces every time you hear a ping from your device.[44] You could, for example, choose to turn off some of the notifications on your device, or even turn on flight mode when you need to be completely undisturbed. But I have often wondered why every e-book reader application does not have an optional 'do not disturb' function similar to Kobo's 'Reading Mode' or Kindle Fire's 'Quiet Time',[45] that automatically turns off all alerts from selected applications while you are reading.

A device that is usable by our students?

Is there any device on the market today that meets all our students' needs? A device that is mobile/hand-held, without any distractions, not too small and comes with a pen you can use to make handwritten notes, since handwriting aids the memory better than typing?[46]

I think a tablet like the new 'paper tablet' reMarkable[47] might be interesting to students who want to benefit from the advantages of e-books without losing all the familiar characteristics of paper, even if the first generation of this tablet unfortunately does not support DRM. The reMarkable tablet is about A4 size with an e-ink screen with 'paper feel' and a pen, and you can use it only for reading, writing and sketching. You can transfer documents between the tablet and your computer, but apart from that it has no connection with the outside world that can distract you while you are reading.

> 'Is there any device on the market today that meets all our students' needs?'

Applications with exemplary functionality

There are applications today that offer better functionality for highlighting and annotation than Bluefire Reader, and much better navigation functionality that, at least partly, compensates for the lack of spatial landmarks that we are used to from print books. LiquidText and the Kindle application are a couple of examples of applications that I think have some excellent features, even if they do not support Adobe DRM.

LiquidText[48] is a PDF reader that has a kind of extra margin space beside the text where you can make annotations. Instead of just highlighting text passages, you can pull them out of the document into the margin, where you can organize them with your own notes. And you just need to tap a text passage to get back to the source.

The Kindle application has outstanding navigation features. Page Flip[49] is a speed-browsing function that enables you quickly to swipe past lots of pages and then instantly jump back to where you were by clicking on the little 'current page' thumbnail which is always pinned to the side of the screen. This is perfect if, for example, you want to find a page that you remember the look of, or if you want to explore ahead to see how much there is left of a chapter.

Another nice thing with the Kindle application is that it always shows you where you are in the book without having to click anywhere first. In the bottom right-hand corner you will always see how much of the whole book you have read, and in the bottom left-hand corner you can choose between the number of pages you have read so far and how much time it would take you to finish the current chapter or the whole book.

These are a couple of examples of applications that have done more to meet our needs than most. And LiquidText has even taken a step further and created new, useful functionalities that do not have any equivalents in the paper world.

E-book design

Earlier I referred to authors who think that the best way to read e-books is to read those that are as book-like as possible. And, since most e-books today are just electronic copies of print books with linear text, that perception makes perfect sense.

But what would happen if publishers started to think outside the box a little? What would happen if they created the e-book first and let it utilize all the possibilities that the electronic medium offers?

Not just a copy of the print edition

There are some good examples of e-book design where the e-books are not just a direct copy of a print original. The annual report 'Swedes and the Internet'[50] is one of them. It can be downloaded as a PDF that looks like an ordinary, classical, linear book with its usual table of contents, which is preferable if you want to read the entire report from cover to cover.

'what would happen if publishers started to think outside the box a little?'

The same report is also available as a website,[51] where you can use tags to find the content you are interested in. This web version is very handy if you are only interested in parts of the report, but hopeless if you want to read the entire book – or print it out.

So much more than the print edition

When you read the iPad application edition of T S Eliot's *The Waste Land* from Touch Press[52] you cannot smell the book, nor can you feel the pages as you turn them. Instead, you can listen to the author reading his own work, or watch the actress Fiona Shaw perform the poem synchronized to the text – all the time with access to detailed notes. And, if you still do not understand the poem's many references and allusions, there are 35 expert interviews included in the application that you can watch. What literature student would not prefer this application to the print book?

How can librarians add value here and now?

Until all students have a suitable device that they are familiar with and that offers a smooth reading experience, we need to offer training on how to find, download and read e-books as well as how to use different devices.

I also think it would be of use to our students if we always purchased the DRM-free e-book when available, and that we sometimes still need to purchase both the print and the electronic book, because, even if e-books have many advantages, sometimes you just might still prefer a print book.

Abbreviations and Acronyms
A list of the abbreviations and acronyms used in this and other *Insight*s articles can be accessed here – click on the URL below and then select the 'Abbreviations and Acronyms' link at the top of the page it directs you to: **http://www.uksg.org/publications#aa**

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