E-Books:
Why They Matter for Distance Education—and How They Could Get Much Better
by David Rothman

If ever a promising technology existed for education—and distance learning in particular—it would be e-books. A prime example is at the University of Texas at Dallas (UTD), where most of the 14,500 students use some form of distance learning. The growth of e-books at this institution is astounding. University librarian Ellen Safley notes that as compared to print document use, UTD's e-book use by document jumped from 29% in 2004 to 58% in 2005; she also reports that the library's electronic collection includes over 131,670 titles (2006). Granted, UTD stands out with a heavy focus on distance learning and research, but it is still an example of the potential viability of e-books for many other institutions. Unfortunately, the more widespread use of e-books by institutions has been compromised by a variety of factors that need to be adequately clarified and addressed in order for the full advantages of this technology to be realized.

As a co-founder of the OpenReader Consortium and a participant in the development of dotReader, an upcoming open-source software program for e-book users, I am not disinterested in these issues. This article will examine (a) why e-books should matter to distance educators, (b) examples of the e-book myths holding back adoption, (c) usability issues, (d) the technology's very real problems, and (e) at least a partial solution in OpenReader, a new e-book standard that could mitigate some of the difficulties associated with this technology. In addressing these points, I hope to provide an assessment of e-book technology that does justice to its true potential as well as its current limitations while also calling attention to future developments that hold genuine promise for educators.

Why E-Books Should Matter to Distance Educators

For early adopters such as the open-minded librarians and savvy patrons at UTD, the positives are inescapable, and the same is true for distance educators and enlightened publishers. E-books can be more searchable—via keyword and otherwise—than the best-indexed paper books, especially for multi-book searches. E-books take up no space in the stacks and can be easily transmitted via the Internet. Publishers and libraries need not pay for printing or physical distribution, and updates are cheaper—savings that ideally can be passed on to users and help reduce the book budgets of libraries and schools. Electronic distribution allows for the ultimate in accessibility, especially for distance learners and others who are time-strapped. Readers in a small Texas town or even the Australian outback can tap into the world's greatest classics or call up arcane research from digitized monographs.

Furthermore, the technology of e-books also has the potential to allow additional functions, features, and capabilities. For example, one major advantage of digital book technology is that chapters from different e-books can be chosen and combined in single books for courses or even for individual students with the appropriate technical and business arrangements in place. Rather than relying on multiple reserved readings or expensive course-packs, instructors could edit their own e-books and distribute them online to their students. Additionally, e-books can (and should) offer such features as speech-synthesizer enablement, large type, and user-chosen colors on screen to accommodate the needs of people with disabilities. Digital book technology also allows for the possibility that future readers can go directly to the cited paragraphs in referenced books rather than seeing mere footnotes, and e-books will soon be able to accommodate interactive features such as reader annotations, discussion forums, blogs, and electronic tests to support sustained analysis and measure reader understanding at designated points throughout the text. For distance educators as well as traditional classroom educators, such components would not only enhance student access to information but would also help revolutionize the processes of reading, analyzing, and researching

in their courses.

The Critics and Examples of E-Book Myths

However, not everyone is as receptive to the glories of digital books as the librarians at UTD are. Many professionals in academia, journalism, and literature have warned against books on a screen even if such technology could provide classics for the masses. Despite the advantages that e-book technology holds, even some librarians have joined in this censure of digital books.

In December 2004 the *Los Angeles Times* published two harsh attacks on the technology—both by academic luminaries—within several days of each other. To my knowledge the authors have not recanted, and their negative comments raise an issue that some of the most fervent supporters of e-books might overlook in their enthusiasm. One of the academics attacking e-books was the linguist Geoffrey Nunberg of both the [University of California at Berkeley](#) and [Stanford University](#). The other was Michael Gorman, the 2005-2006 president of the American Library Association ([ALA](#)) and the about-to-retire Dean of Library Services at [California State University](#).

For Nunberg, one shortcoming of e-books is that they supposedly cannot give the "overall sense of place" that paper books offer; as he observes, "Reading Proust in a browser window is like touring Normandy through a bombsite" ([2004](#), ¶ 11). This determined e-book critic presumably refers to the reader's lost ability to mark overall progress while reading, either in the sense of material covered or story development, not to mention the noted difficulty of reading text on a low resolution screen. As we will learn, however, e-book software can now even help address issues such as measuring the reader's place within a book or tracking the fates of various characters. Additionally, screen resolutions have recently improved and will soon be even better.

While not speaking on behalf of the ALA as a whole, Gorman has criticized the prospect of "massive databases of digitized whole books" supplanting the print medium of traditional library collections ([2004](#), ¶ 7). To an extent, his criticism overlaps somewhat with Nunberg's; he worries that digital books will deprive readers of the necessary context for fully engaged reading. Gorman fears that isolated facts picked up through database searches will prevail over true knowledge, which he defines as "the cumulative exposition found in scholarly and literary texts and in popular nonfiction . . . When it comes to recorded knowledge, a snippet from Page 142 must be understood in the light of pages 1 through 141 or the text was not worth writing and publishing in the first place" (¶ 6). My own reaction is "It depends." Many works of nonfiction have chapters that indeed could have been reordered or taken singly, and more importantly, there is no reason why one cannot choose to read an e-book straight through just like the print variety.

To his credit, Gorman does accept certain specialized uses for e-books, such as preserving special collections or providing reference information in the form of encyclopedias or dictionaries. And Nunberg laudably concedes the value of e-books for "finding a reference or locating a particular passage" or as lures to convince readers to buy books in print ([2004](#), ¶ 10). But at least in the above articles, these critics have not been strong advocates of e-books for sustained reading, whether due to context-related concerns or other objections. This negative press is likely to have serious effects on certain educators who are considering the usefulness of teaching with e-book technologies even though the criticism directed at e-books derives mostly from associated changes in reading habits that may not be limited to digital books in their own right.

So what *is* the truth about e-books?

E-Books in Real Life: The Nuances of Usability

E-books, it turns out, are my favorite way to enjoy French novels or novels of any other kind, and my own experience in this regard may help address some of the criticisms leveled towards this technology.

While visiting in-laws in a North Carolina mill town around the time of the publication of the Nunberg and Gorman articles, I read an e-book text from another French master, Gustave Flaubert. Once I had downloaded the HTML text of *Madame Bovary* (Flaubert 1857) from the University of Virginia's Electronic Text Center, software from Mobipocket let me easily know my place in the novel as I read. A thin red line at the bottom of my screen (as illustrated in this screenshot) told me without the least fuss; the closer the bar crept toward the right edge, the nearer I was to the end of the novel. I could even see Mobipocket-assigned page numbers, representing screen views. What's more, I could have looked for the first occurrence of a character's name in the novel, a godsend for readers of long literary works; I could also have skipped ahead to the next mention of a character's name or have gone back to earlier ones. Simply put, I actually felt more at home reading a complex and nuanced literary masterpiece from a machine than with a paper book. Moreover, just one memory card of a gigabyte could hold more than 1,000 books. Imagine the possibilities then for distance education at all levels, given the wider range of books that could be made available to students in small towns like the one I was visiting.

Just like trying to understand Flaubert or another literary great, one must consider the nuances in evaluating e-book hardware and software. Plowing through e-books by way of Adobe Reader on a tiny personal digital assistant with a blurry screen is far less pleasant than using Mobipocket, optimized for hand-held machines but more usable on tablets. While reading Flaubert, I was not struggling with the text on an undersized PDA or a desktop computer with Internet Explorer or another Web browser. Instead I could see *Madame Bovary* on a Cybook (reviewed by Rothman 2004), Bookeen's tablet-style machine with a leather-like cover protecting a sharp ten-inch screen. Imagine the possibilities for Francophiles—reading Proust and Flaubert with French software on a French machine! The Cybook's current price is $399 without shipping, and I would not be surprised to see it drop into the low $300s or even $200s within a year if it is still on the market.

Of course, I might instead have used the more advanced Sony Librie, which comes with a screen that reflects light just like paper. (See Sven Neuhaus's wiki [2006] for more information on the Librie.) This hardware device has been officially sold only in Japan and offers only a suboptimal contrast ratio between the text and the background, but better technology is on the way—if not in the case of the new U.S.-targeted Sony Reader or the iLiad (reviewed by Collin 2006), then in the case of other machines. Quantifying progress in other respects, iRex Technologies says of its E Ink screen on the iLiad: "The 8.1-inch (diagonal) monochrome Electronic Paper display contains 1024 x 768 pixels and supports 16 levels of grey (160 dpi)" (2006, "Description," ¶ 1). In other words, while not at the level of paper, the iLiad screen already offers almost the same number of dots per inch as a newspaper. Future technology in turn should surpass the iLiad; if nothing else, color E Ink machines or the equivalent should be on sale in the next few years.

Microsoft's newly announced class of LCD-screened tablets, known as the Ultra Mobile Personal Computer (UMPC), should be another contender once screen sharpness improves, prices drop, and the company can better adapt the XP operating system for a smaller screen. Prices should fall below $500 in the next year or so. The Linux-supporting Pepper Pad 3 tablets from Pepper Computing should cost $500 by the time this article appears or soon after; they will include a seven-inch screen (about the size of the UMPC's) that will be large enough for most properly formatted e-books, at least those without extra-detailed illustrations or other complications.

As these recent developments suggest, display technology will only get better with newer advances. In the future, readers may even be able to enjoy electronic books with flippable pages (Jacobson 1997) just like so-called real books, in effect blurring the distinctions. (For a survey of recent hardware products beyond those mentioned above, see comparisons by Megan Fox [2006].)

The True Negatives

E-books do have problems, of course—major ones, such as copyright issues (Kelly 2006). Yearly e-book sales today are probably well under $30 million in the United States, a fraction of the tens of billions of dollars in paper books sold according to trade association figures from publisher surveys (International Digital

Publishing Forum 2005). Mark Carey, the CEO of OSoft, nicely sums up the failings of e-books when he asks:

- What happens to e-books when the format or hardware becomes obsolete? What do you do with them? You can't even burn them to stay warm this winter!
- How do you lend your e-book to someone else (like a paperback) without violating copyright laws or giving away sensitive personal information such as passwords or even credit card info? Publishers don't have a problem with people sharing paperbacks; why should electronic books be any different?
- Why can't a single e-book standard be supported on virtually all hardware, be it present and future? Standards exist in virtually every industry. Why not e-books?
- Why do so many e-books cost as much as printed books? (2006, "Great e-Book Mysteries," ¶ 1)

One faithful e-book buyer reported purchasing more than 500 e-books over the years from a single publisher—only to lose access to many because of ephemeral formats (Applegate 2006). Proprietary e-book formats, as this case shows, frustrate digital readers, possibly discouraging some from buying e-books in the long term (cf. Rothman 2006). How many people want to buy books that they cannot permanently own? To deal with the current fragility of the "Tower of eBabel" (cf. Carey 2006, ¶ 2), I restrict myself to public domain books, read promotional copies given away by publishers and software companies, or legally borrow e-books from the subscription collection at KnowBetter.com. These self-imposed restrictions hardly offer an ultimate solution, nor does a limited e-book collection at a nearby public library system, but such measures are better than paying for commercial titles that may not be accessible in the future.

Related to the ownership issue is the that of copy-protection measures popularly known as Digital Rights Management (DRM). If access-limiting DRM is proprietary—controlled by companies owning the protection technology—then the book will be unreadable even if the actual core e-book format is the same. For distance education, so often dependent on collaborative learning, today's forms of DRM can be disastrous. One of the key advantages of e-books is that, ideally, instructors and students would be able to lend each other complete books for at least brief times. On top of everything else, current DRM measures will interfere with precisely located interbook linking, a valuable function that otherwise would facilitate the discovery of books most relevant to readers.

Unfortunately the Open eBook Forum (OeBF), the e-book industry's largest trade organization, now known as the International Digital Publishing Forum (IDPF), has failed to mitigate sufficiently the complexities of e-book formats and DRM. At the world's first formal e-book conference, Microsoft issued a press release (1998) promising that the industry would avoid the "VHS vs. Beta" style problem by ensuring that e-book software and hardware would follow consistent standards. Along the same lines, in the early years of OeBF, the group's technical staff created a production-level standard called the Open eBook Production Structure (OEBPS) to help simplify the creation of e-books in different formats. But then the organization fell into the hands of business people who feared that a universal format would reduce their sales prospects. Led by an e-book distributor offering DRM services, the Forum let its standards efforts wither away.

In recent months, spurred on by the OpenReader Consortium, the IDPF has renewed interest in overcoming the obstacles of different e-book formats and plans to release a revised OEBPS. But corporate egos are clashing with each other. If the e-book world relies only on the IDPF for standards, years might go by before e-books can offer such advantages as reliable and precisely located hyperlinks from one book to another as well as a seamless DRM solution for true industry-wide compatibility.

New Solutions: The OpenReader Standard

Meanwhile the separate OpenReader Consortium is refining a consumer standard based on the OeBF/IDPF's production-level work. The new OpenReader standard is intended to work on virtually all of the popular operating systems, and it includes such Web-related technologies as XML markup language and CSS styling,

both of which can help publishers more easily control their books' aesthetics. Typographical capabilities will be far more sophisticated than those of the latest Sony E Ink machine. Among other e-book software issues the OpenReader standard addresses are the following:

- The standard will allow for the graceful evolution of new e-book formats so that people can display old books on new machines, thereby avoiding the incalculable future archival risks from the proprietary approach.
- The standard will support easy conversions to and from its share of multiple e-book formats, which will help lower publishers' costs.
- The standard will provide guidelines to guarantee the good display of text on a variety of screen sizes. With PDF software now so common, e-book users may have to scroll from left to right on smaller machines; as a result, the text does not flow properly to adjust for smaller screens.
- The standard will support capabilities for embedded video and audio in e-books.
- The standard will accomodate true deep linking—in other words, links from precise locations in books to precise locations in others—even with DRM in use.

In addition, the OpenReader standard will allow embedded blogs, annotations, and multi-threaded discussions within precise locations of electronic books and journal articles, turning them into complex social objects and enhancing the odds of scholars serendipitously finding just the right items to acquire new insights. Such features will allow permanent communities to form around books—communities integrally tied to the books they study rather than a dispersed collection of participants foraging among discussion groups on the Web. Imagine the possibility of librarians, educators, students, and ordinary readers annotating a book together. They will be able to share knowledge far more efficiently than with scrawls in old card catalogs. The notes and blogs will be readable and searchable even offline, and moderation of discussions will be possible.

In conjunction with the development of the OpenReader standard, OSoft's dotReader, the first e-reader software designed for this standard, will be downloadable for free via the Internet later this year. The software is designed to run on a variety of operating systems (Windows, MAC, OS X, Linux, Tablet PCs, and most PDAs), and its capabilities will include a customizable interface, the ability to embed forums and blogs inside e-books and allow the add-ons to be read offline, and other interactive features such as tests that can gauge students' progress or allow readers to self-monitor their own understanding of the text. Fully open-source except for the optional DRM module, dotReader will work with different business models, including both traditional and nontraditional. For example, the software will allow publishers to insert advertising in electronic textbooks and other publications to lower or eliminate charges. A $100 math book may sell for just $39 through OSoft's partnership with Freeload Press, whose founder Tom Doran reports that there is "tremendous interest from top publishers of college texts" (OSoft 2006, "New Commercial Option," ¶ 4). If publishers choose, students will see ads only when going from chapter to chapter whereas at other times they will be able switch them off to focus on studies. The best solution, of course, would be free textbooks for all and without ads—that is my emphatic preference—but certainly books with polite ads are preferable to books that students cannot afford or that instructors will not assign due to their prohibitive cost.

It should be noted that the OpenReader standard currently does not have provisions for DRM copy protection; it will be up to the standards-setters to determine the ultimate DRM solution for e-book software. As a first step in this direction, however, OSoft's Mark Carey and his chief technical officer Gary Varnell plan for the copy protection function of dotReader to be far more flexible and gentler on readers than in the current variety of e-book applications. For example, dotReader will allow for the aforementioned deep linking function included in the OpenReader standard and yet will still permit books to be copy protected. DRM will be linked to the owner of the machine rather than the device itself, meaning that consenting publishers can allow book buyers to read the same books on all the machines they own. When and if publishers consent, OSoft also wants its DRM to allow for such possibilities as the resale and lending of e-books—examples of standard fair-use practices now common with paper books. In addition, OSoft's DRM will allow copy protection of only specific sections within e-books; like some existing systems, it will also permit timed expiration of copyrighted

content, which will be a useful feature in both library and retail contexts.

Carey and Varnell, like most academics and readers, are not zealous proponents of DRM and added copy protection only because big publishers insisted on it; their company originally was offering a reader without DRM. The delightful irony is that the technology from OSoft's reluctant DRM creators appears more useful and more sophisticated than the variety offered by vigorous defenders of copy protection. Although the OSoft solution will not miraculously settle fair-use debates or end the DRM controversy, it offers a significant tool by which the different stakeholders can affect e-book-related compromises. For example, dotReader software could allow publishers and nonprofits to act together as DRM registrars rather than opposing parties in copyright-related conflicts. Significantly, too, OSoft is committed to low DRM costs and the concept of avoiding a DRM-related chokehold. The company's flexibility on DRM-related business and administrative issues could give e-books a nice kickstart if standards-setters decide that this technology offers the best solution to the controversy. While the mass media has been far more focused on e-book hardware than software, the new software standard and its dotReader implementation could matter equally in the long run if institutions put their full support behind it as opposed to simply supporting the proprietary e-book formats.

Over the longer term, the evolutionary approach to books exemplified by the OpenReader standard and dotReader could jive nicely with the proposal ([2005](#)) of Roger Sperberg, an e-book advocate and former Random House production expert, to blend full text searches of e-books with indexes of paper books. The concepts of OpenReader and Sperberg would clearly advance libraries and education far beyond paper books—this would be especially true for distance education, which could benefit from shared annotation. Meanwhile OSoft plans features for dotReader beyond the framework of OpenReader that address other criticisms of e-books, such as the difficulty novices have in downloading digital publications. In this and in many other ways, e-books will be improving.

Conclusion

Although critics often overlook the features of e-book technology that make it a valuable and viable medium for enjoyable and engaged reading, the advantages of this technology for distance learning and other educational settings remain substantial. The first step towards realizing the educational potential of e-books is to dispel the myths that currently surround them and to recognize the rapid advances that have already been made in e-book hardware and software. The second and more challenging step is to overcome the genuine obstacles that continue to prevent e-book technology from being widely used by institutions of higher education—obstacles that include copyright constraints and DRM copy protection as well as the corresponding lack of universal standards that would help e-books flourish regardless of changes in hardware or software formats. While not addressing all of these obstacles, the new OpenReader e-book standard and its upcoming implementation in the dotReader software program represent an important step forward in the evolution of e-books for educational settings; in turn, the precedent set by these developments will hopefully serve as a catalyst for future advances in the industry that will allow e-books to thrive in educational settings and beyond. Perhaps ultimately even the current e-book detractors may find themselves taking a little time off from their work, buying e-book devices, resting back in their favorite recliners, and enjoying Proust and Flaubert on screens.

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