eReader Whitepaper

Higher Education

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Executive Summary

EReader technology has dramatically improved in the decade since its release. As a result, the current marketplace is now full of eReaders, eBooks, and distributors of each. But how has this translated to use in academia? In this report we briefly cover eReaders by explaining what they are and examine some of the advantages and disadvantages of their use in the academic environment. We also present a pair of studies which have looked at the issue of implementing eBooks at the university level.

Introduction

Any discussion of eReaders must be prefaced with an explanation of what is meant by the term. According to Sara Dunn, an eReader is a single-purpose electronic device designed to deliver entire books, newspapers, and magazines directly to consumers' hands (n.d.). Dedicated eReaders were introduced in the marketplace in 1998, with the release of the NuvoMedia's Rocket eBook and SoftBook Press' SoftBook (Judge). In the decade since there emergence, eReaders were slow to gain significant market share, until recently as leading booksellers Barnes & Noble and Amazon entered the fray.

True eReaders are distinguishable from other electronic devices primarily in their use of e-paper, or electronic paper, display screens making them easier to read, even in direct sunlight (Electronic Paper Displays). They have evolved to the point where several of them now include wireless connectivity (through either Wi-Fi or a 3G network), replaceable batteries, limited web browsing ability, and even text-to-speech functionality (Ebook Readers).

Currently there are approximately 22 eReaders available from a variety of manufacturers. The most popular eReaders are the Amazon Kindle, Barnes and Noble Nook, and the Sony Reader. Despite the proliferation of the devices, no clear technological standard has emerged allowing for complete compatibility with all publication formats (Ebook Readers).

According to MobileRead.com, there are at least twenty different publication formats available today, with at least fifteen of them incorporating digital rights management (DRM) technology (MobileRead Forums). DRM is used by control and limit the usage of digital content and devices. It was developed in an effort to thwart the piracy of digital products such as films, videos, and music. But it has found its way into the world of eReaders and eBooks.

While DRM seems to have run its course in the music industry, it is still alive and well in the software and eBooks industries. Any current owner of an eReader is well aware of the limitations that DRM levies on their ability to copy, print, or even shares their eBooks. What is not quite as apparent is the reason why DRM is so prevalent in eBooks.

Eric Lai, in his article *DRM Holding Back EBook Growth*, (2009) says it is all about market share. The two biggest opponents to an open eBook publishing standard are Adobe and Amazon. Ironically, these are the two biggest champions of eBooks. In a format battle reminiscent of the

videocassette battles of the 1970s, it appears that both of them are looking to become the standard DRM format.

Potentially signaling an escalation in this battle, Barnes & Noble, Amazon's chief competitor is book sales, partnered with Adobe to provide DRM for their Nook eReader (Barnes and Noble). Another interesting component of this battle is the consumer's ability to circumvent the DRM in the first place. A Google search on either type of DRM reveals a variety of sites providing hacks to get around the DRM. If DRM is so easily bypassed, maybe the vendors will remove it allowing eBooks to be easily downloaded and read on any device.

Additionally, the recent evolution of the smartPhone may have also signaled another shift in the eBook landscape. All of the major smartPhone operating systems (Android, Apple, & Windows) now have eBook reader applications available. The Mobipocket ebook reader will allow users to read Kindle books, while the Aldiko application allows smartphones to read DRM protected epub books (Ebook Readers).

Interestingly, the evolution of the smartphone may have more significance to this discussion than it appears. With eBooks being read on smartphones, it raises the issue of what other devices are capable of reading them. For starters, PCs can be used. Amazon provides a free application that can be downloaded to a Windows-based computer allowing their Kindle eBooks to be read without a Kindle (Amazon.com). Likewise, Barnes & Noble is also providing a free eReader application for use with Nook eBooks (Barnes and Noble).

More importantly for this discussion, this software also works on any Windows-based computer, meaning that laptops, notebooks, netbooks, and tablets can all be used as eReaders. And college students are already using these tools in their classrooms.

What is it that we know about the use of eReaders? For starters, we know that there are DRM compatibility issues. The DRM market is currently controlled by Adobe and Amazon. But we also know that all the eReaders on the market can read almost any non-DRM format. So, unless the college textbook publishers decide to incorporate DRM, the student's choice of brand will be of no consequence.

Arguments for eReaders in Education:

These can be broken down into a relatively short list of perceived benefits:

- Allows text books to be easily kept up to date.
- Economy. This is especially interesting to international school libraries facing huge delivery charges and import duties for books (very heavy things, paper books!)
- eReaders that have a text to Speech function give an extra tool to teachers for kids who learn better by hearing facts than by reading them.
- Weight: One eReader compared to several textbooks offers easier portability
- Students who have used eReaders have said they vastly prefer reading that way to reading from a computer screen.
- Speed of obtaining desired books for a particular class or course.

Arguments Against eReaders in Education:

There are quite a lot of problems mentioned whenever this topic is discussed, and here is a short list of the main problems found people have expressed:

- eReaders are simply not pleasant things to use. Many can be awkward to hold and operate.
- Lack of suitable content. Sadly this is currently true, as Publishers are still very cautious about issuing their lists in eBook format. But it is changing, and if publishers became convinced that there was a real market for eBook versions of their text books, they will surely come on board quickly.
- Expense: eReaders *are* expensive when one buys them one by one, but most companies give good discounts to schools. Further, if the eReaders were issued on a year by year basis (they are returned at the end of each school year), and provided content exists, the saving in delivery costs would soon cover the purchasing costs of the eReaders.
- Theft or Loss: If a student loses their eReader, or it is stolen, in most cases they would be held responsible. See expense.

- ## eReaders vs. Traditional Textbooks In Education

Cost

With ordinary eBooks and with e-textbooks, the cost tends to be less for the digital book itself—up until recently, with publishers renegotiating prices with Amazon on hardcover titles, you could buy even recent releases online for $9.99—a significant discount over hardcover prices. With e-textbooks, you can also expect discounts.

CourseSmart, an online e-textbook seller, reports that it typically sells e-textbooks for half the listed price of a hard copy textbook. Amazon sells e-textbooks at a discount as well, although they may not be as much as 50% off the hard copy price.

Still, with some textbooks costing $200 or more, that still means prices that some students would see as unreasonably high—but they're still better than what you'd find at the college bookstore. However, one may still be better off purchasing textbooks from students who used them last semester, online at a used textbook store, or getting your textbooks at the college library if you really want to save money. An eReader will cost you upwards of $250 or more in addition to the cost of the books.

Convenience

EReaders do have an advantage over hardcopy books when it comes to convenience. With an eReader, you don't have to carry heavy books. It's light and easy to carry. However, it's much more fragile than an ordinary book, and if you break it or lose it, you'll have to pay more to replace it. However, in the case of college textbooks, you might not have to pay a lot more.

Readability

Depending on the screen size and resolution, eReaders are very readable and work well in normal classroom or home settings. However, many do not perform well in direct sunlight. Some are significantly smaller and have a lower screen resolution than others making reading difficult. For eReaders that are larger and have a high screen resolution the cost should be taken into consideration. Normally the larger and higher screen resolution an eReader has, the more expensive it is.

Practicality

Like with a standard textbook, you can highlight and write notes in the margins on some eReaders. Reviews suggest that typing margin notes using the keyboard on an eReader can be cumbersome, however. Furthermore, you can’t keep several textbooks open at once on eReaders, and you can’t lend your textbooks to friends and classmates unless you want to lend out your entire library.

Some students who already own a laptop note that it offers all the same features as an eReader and more, except for some slight added portability. Hence, they don't really see the need for an eReader.

Roadblock for the Disabled

Students who are blind or have low vision are finding it difficult to use the eReader. This observation was apparent during pilot studies that took place at Pace University, Princeton University, Case Western University, and the University of Virginia's Darden School of Business. The eReaders that were incorporated in the classroom at these universities were Amazon Kindle and Kindle Dx. The main complaint issued was that although the eReaders have text to speech capabilities they lacked menus that can be easily navigated by the visually impaired (Carter, 2010). Of the eReaders available on the market (2010) Chris Danielsen, a spokesman for the National Federation of the Blind, believes the iPad comes the closest to accommodating the needs of the visually impaired because of the large menu screen (Carter, 2010).

A discrimination lawsuit was filed against Arizona State University by the National Federation of the Blind and the American Council of the Blind Colleges forcing Arizona State to end their pilot program (Carter, 2010). The U.S. Department of Justice and the U.S. Department of Education issued a letter (June 29, 2010 – See Appendix 1.0) expressing concern that eReaders are being used in colleges where students with low vision or who are blind are not able to fully utilize the technology (Perez & Ali, 2010). All colleges, private or public, must follow federal law by providing accommodations or modifications that allow the visually impaired to have the same educational benefits from the eReader as those without a disability (Perez & Ali, 2010).

Research Studies

Northwest Missouri State University

In the fall of 2008, Northwest Missouri State University undertook a study of the "feasibility of transitioning from the rental of traditional textbooks to the rental of e-textbooks, along with the extensive integration of e-textbooks across the university's academic environment." Their motivation was the growing concern over the escalating costs of textbooks in higher education, coupled with the cost-containment goals outlined in the Higher Education Reauthorization Act of 2008 (Northwest Missouri State University).

The study, citing National Association of College Stores statistics, is one of approximately 20 institutions in the United States that provide students with the required texts through a mandatory book rental program. This rental program made NMSU a perfect laboratory for conducting such a study.

The study was conducted in three phases. In the first phase they considered the viability of using e-book readers. The e-book reader used during this phase was the Sony Reader Digital Book. The Amazon Kindle was also considered for the study, but the school's administration wanted to avoid the proprietary format and Amazon showed no interest in participating at the time.

Phase I was facilitated by the use of the existing eCollege course management system, allowing for the efficient delivery and integration of the e-textbooks. Without this existing infrastructure, NMSU would have had to create the infrastructure from scratch, adding to expense and time necessary to complete Phase I.

There were 4 courses chosen to participate in Phase I and almost 200 eReaders were used. The courses were selected from a group of volunteer faculty members based mostly on the availability on existing e-textbooks. Among the findings from Phase One were:

- There are currently not enough eReader–compatible e-textbooks for campus-wide deployment.
- Most e-textbooks are available only through laptop computers and/or web access.
- PDF-formatted textbooks have restrictive and slow navigation options.
- The enthusiasm for eReaders quickly waned without the desired search and annotation features.

Table 1
Sony Reader Versus Laptop Computer as E-Book Reader

Features	Sony Reader PRS-505	Laptop Computer
Color capable	NA	Yes
Animations	NA	Yes
Interactive functions (quizzes, video, etc.)	NA	Yes
Search function (available with Sony Reader PRS-700)	NA	Yes
Annotation/highlighting capability	NA	Yes
Wireless Internet capability	NA	Yes
Links to external resources	NA	Yes
Integrates academic learning tools and resources	NA	Yes

Table 1 Sony Reader versus Laptop Computer as E-Book Reader

In terms of cost, Northwest considers the laptop computer a basic service that cannot be replaced by current eReader technology. Therefore, the study had to consider the additional cost of the eReaders.

Phase II of the study, conducted during the spring semester of 2009, focused on the use of electronic books designed for use on the school furnished laptop computers. This phase of the study included 20 classes and approximately 500 total students.

As one of the cost-factors, NMSU considers the laptop to be a basic service that cannot be replaced by eReader technology. As such, the additional cost of purchasing eReaders for all students is an additional consideration.

The school provides incoming freshmen laptops that they are expected to use throughout their four-year degree program. This fact ensured that all machines in use were fully compatible with the textbook format, an issue that may be problematic for schools where students provide their own computers.

Table 2 identifies a few of the courses involved in Phase II along with the e-textbook titles used for the semester. You can tell from the table that the e-textbook was roughly half the cost of the traditional textbook.

Table 2
NMSU Courses in Spring 2009

Pilot Course Title	**Cost of Traditional Textbook**	**Approximate Cost of E-Textbook (Publisher Platform)**
Fundamentals of Business Finance	$168.00	$72.25 (VitalSource)
Human Resources Management	$130.00	$68.75 (VitalSource)
Intercultural Communication	$95.00	$51.48 (Coursemart — 180-day subscription)
Management Information Systems	$140.00	$71.49 (Coursemart — 180-day subscription)
Introduction to Psychology	$121.00	$62.95 (Coursemart —180-day subscription)

The Enjoyment of Music	$130.00	Not available
Reporting Pupil Progress	$69.00	Not available
Pluralism and Multiculturalism	$81.00	Not available
College Algebra (MyMathLab)	$130.00	Not available

Table 2 NMSU Courses in Spring 2009

Among the findings in Phase II were:

- Delivery of e-textbooks to student laptops was simple and efficient.
- Several publishers provided enhanced e-textbooks with quizzes and shared notes.
- Students liked the idea of carrying lighter backpacks.
- The VitalSource platform allowed students to share notes and highlights.

Although the use of e-textbooks on the laptop computers was generally well-received, some of the results in a post-study survey of students actively involved in Phase II may indicate otherwise. Figure 1 indicates that 60 percent of the students felt they read more when using physical textbooks than they did using e-textbooks.

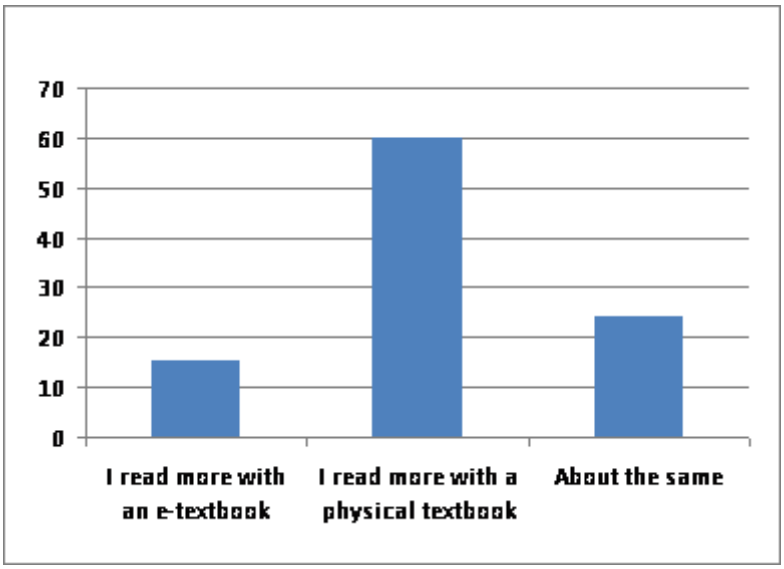


Figure 1 Amount of Student Reading

Generally students found that the e-textbooks were more convenient for accessing and retrieving information, with 56.25 percent of students indicating that e-textbooks significantly outperformed regular physical textbooks. However, the survey also revealed that 47 percent of the students still prefer physical textbooks.

Phase III was managing the transition of e-textbooks throughout the university in a manner that would contain costs and garner the support of students, faculty and the administration. Initially the administration sought to replace the traditional textbooks with e-textbooks over a three- or four-year period. However, the process proved too complex for that aggressive of a schedule. Among the factors that NMSU had to deal with is the availability of e-textbooks for certain disciplines and the major investment that the school had in the inventory of traditional textbooks.

To deal with these factors, NMSU decided to consider the replacement of traditional textbooks with electronic versions when they reached their normal replacement cycle. In addition, the quality and availability of e-textbooks are improving rapidly. Publishers have indicated a commitment to the technology and plan to continue investing in enhancing their electronic offerings.

OnCampus Research: Electronic Book and eReader Device Report

In 2010, the National Association of College Stores (NACS) published the results of a study[1] centered on college students' use and familiarity of e-books. The study, conducted through NACS' OnCampus Research Division, was comprised of 627 students from the OnCampus Research Student Panel. An eReader device survey was sent to the students on October 5, 2010. This survey was also administered in 2009.

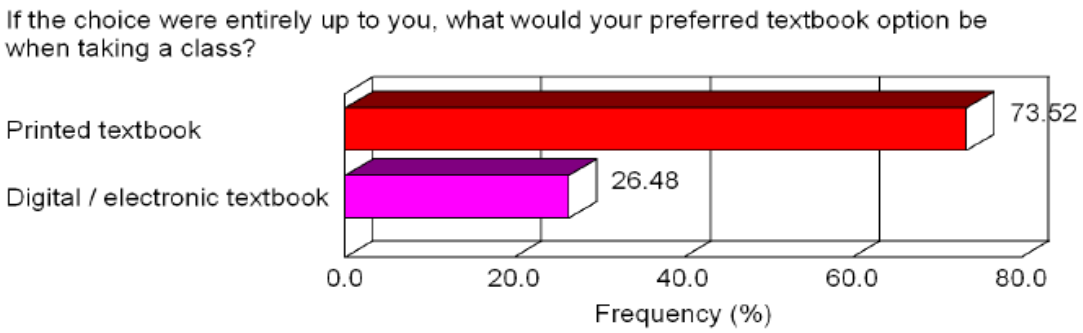
The results of the study showed 74% of the participants preferred the textbook option over the digital/electronic option. This survey when administered in 2009 indicated the same result, that 74% of the students preferred textbooks.

Around 14% of the students in the 2010 study indicated that the reason they preferred text over digital is because they would have access to the textbook after the end of the semester and they have an option to sell their book back, 7% said there is no buyback option, 5% there is no digital /electronic textbooks for their classes, and 5% said the professor uses a textbook copy.

The 83% of students who preferred electronic forms of books over text books stated that the use of electronic books reduces the weight on their backs by not having to carry bulky textbooks, 78% indicated that all of their material is in one place, 69% is because it helps the environment by saving paper, 63% contribute their decision to price, 42% prefers the technology, and 64% says its due to the convenience.

The students mentioned in the open-ended comment section of the study a concern with cost, the lack of ability to print chapters, highlight text, and the inability to take notes. They also wanted bigger font and expressed concern for their health. They wondered if the digital screen would affect their eyes. Some would only purchase digital textbooks if it was a class requirement and some indicated they would use digital textbooks if they could use laptops in class. The participants indicated concern with the reliability of the product and the possibility of deleting material. Basically, not everyone is on board with embracing technology.

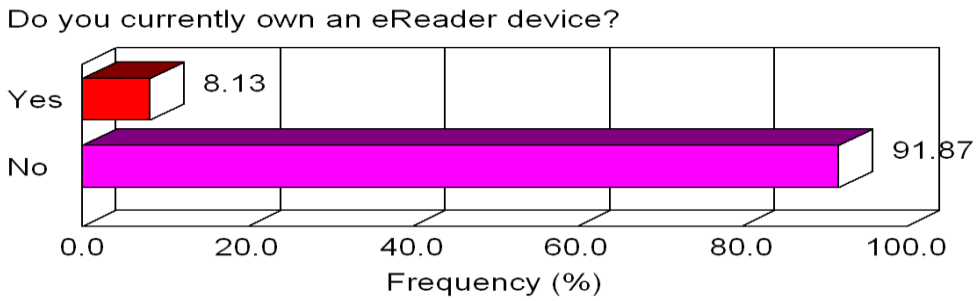
[1] OnCampus Research - Electronic Book and e-Reader Device Report



* The Electronic Book and eReader Device Survey – OnCampus Research Student Panel Oct. 5, 2010.

Figure 2 Preferred Textbook Option

Of the participants 92% said they do not own an eReader device. Only 5% of those have plans to purchase one in the near future. The participants indicated their use would be for leisure reading (96%), for school use (74%), and to have the latest gadget (37%). For those interested in purchasing Apple was the front runner with 26%, than followed by Amazon Kindle DX with 15%, Amazon Kindle 3 with 15% and those unsure of which device to buy was around 22%.



* The Electronic Book and eReader Device Survey – OnCampus Research Student Panel Oct. 5, 2010.

Figure 3 Ownership Rates of eReaders

Conclusion

Although eReader technology has been available for over a decade, it was not until recently that they began to receive wide acceptance in either the public or academic environments. However the increased cost of publishing textbooks, the rapidly improving distribution tools, the adoption of the technology by publishers and the wide availability of reader platforms have combined to make e-textbooks a viable option on today's college campuses.

As the technology improves and more e-textbooks become available, the decision to convert to the electronic versions will become more about economics than availability. There will, however, be a number of factors that will influence this decision. They include, but are not limited to:

- What delivery platform will be employed? (eReader, laptop, iPad, etc.)
- How will authors be compensated?
- What will the financial impact be on students and/or the university?
- Is the current on-campus infrastructure capable of handing the additional data transfers that will be necessary?

- **Bibliography**

Amazon.com. (n.d.). Retrieved March 16, 2011, from Amazon.com Web site: http://www.amazon.com/

Barnes and Noble. (n.d.). Retrieved March 19, 2011, from Barnes & Noble: http://www.barnesandnoble.com/

Carter, Denny. Feds: Make eReaders accessible to all students | Policy | eSchoolNews.com. (n.d.). . Retrieved March 31, 2011, from http://www.eschoolnews.com/2010/06/30/feds-make-ereaders-accessible-to-all-students/

Dunn, Sara. (n.d.). What is an E-Reader? Retrieved from: http://ezinearticles.com/?What-is-an-E-Reader?&id=1230198

Ebook Readers. (n.d.). Retrieved March 21, 2011, from Ebook Reader Matrix: http://ereaderbookmatrix.com/

Electronic Paper Displays. (n.d.). Retrieved March 23, 2011, from E-Ink Web site: http://www.eink.com/

Judge, Paul. (1998). E-Books: A Library on your Lap. Business Week. Retrieved from: http://www.businessweek.com/1998/46/b3604010.htm

Lai, Eric. (2009). DRM Holding Back EBook Growth. PC World. Retrieved from: http://www.pcworld.com/article/159821/drm_holding_back_ebook_growth.html

MobileRead Forums. (n.d.). Retrieved March 21, 2011, from MobileRead Forums Web site: http://www.mobileread.com/

Northwest Missouri State University. (n.d.). Retrieved March 28, 2011, from Northwest Missouri State University Web site: http://www.nwmissouri.edu/

Perez, Thomas, & Ali, Russlynn. Joint - Dear Colleague Letter: Electronic Book Readers. (n.d.). Retrieved March 31, 2011, from http://www2.ed.gov/about/offices/list/ocr/letters/colleague-20100629.html

Unknown. eReaders in schools and Universities – a good idea? | eBookanoid.com. (n.d.). Retrieved March 23, 2011, from http://www.ebookanoid.com/2010/03/01/ereaders-in-schools-and-universities-a-good-idea/

Unknown. Results. (n.d.). . Retrieved March 31, 2011, from http://www.nacs.org/AdvancedSearch/Results.aspx?xsq=2010+e+reader+study&bsc

Williamson, Jennifer. (2010, March 29). E-readers or Traditional Books: Which Is Better for Education? - Distance Education.org. *DistanceEducation.org*. Retrieved March 23, 2011, from http://www.distance-education.org/Articles/E-readers-or-Traditional-Books--Which-Is-Better-for-Education--232.html

- **Appendix**

1.0 - http://www2.ed.gov/about/offices/list/ocr/letters/colleague-20100629.pdf