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Ebook Showdown: Evaluating Academic Ebook Platforms from a User Perspective

Christina Mune
San Jose State University, christina.mune@sjsu.edu

Ann Agee
San Jose State University, ann.agee@sjsu.edu

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Introduction

Across all types of libraries in the United States, ebook usage and acquisition continues to rise. According to a 2012 *Library Journal* study, ebook holdings in academic libraries went up an average of 41% between 2011 and 2012. Of the 339 academic libraries surveyed, 95% reported offering ebooks as part of their regular collection.[1]

Libraries interested in increasing ebook offerings face an overwhelming variety of publisher and aggregator platform choices, package options, and cost models that must be considered in conjunction with discipline and user preferences. However, for many academic librarians questions of the usability and accessibility of digital formats for students are foremost, casting doubt on the viability of replacing print books with ebooks. Giving all students the independence to read and research on their own is vital to a quality education. "It is the right thing to do, the smart thing to do, and it is the law."[2] As library collections move online, it is essential that publishers offer the features necessary to make them as usable as print titles, as well as accessible to those students whose physical or cognitive disabilities make print books an unworkable option.

There are several reviews in the literature on the usability and accessibility of ebook readers—such as Kobo and Kindle—but few systematic analyses of the software platforms that support academic ebooks purchased by university and college libraries. The books on these platforms are accessed via the Internet using each publisher's proprietary interface and the user's experience can be different for each publisher.

As part of San Jose State University's (SJSU) Ebook Accessibility Project (EAP), 16 major academic ebook platforms were evaluated with the goal of allowing students and librarians to make more informed decisions about which platforms are most accessible and user friendly to students, particularly those with disabilities. This paper discusses our findings and offers a summary of our results. (Note: These platform evaluations were performed in June-August 2014. Newer versions of the platforms with additional features may have been implemented after this time.)

Overview

Previous research has revealed what features ebook readers find most useful or that influence their preference for ebooks over print versions of the same title. These features usually fall within two categories: modes of access and functionality. Around-the-clock availability, instant online access, and "no need to visit the library" persistently top the list of ebook features that are most appealing.[3] Virtually all academic ebook platforms, including those in this study, currently offer 24/7 online access. Functional features that reportedly improve ebook usability and influence users in their preference for ebooks over print are also consis-

Christina Mune is Academic Liaison Librarian at San Jose State University, e-mail: christina.mune@sjsu.edu; Ann Agee is Academic Liaison Librarian at San Jose State University, e-mail: ann.agee@sjsu.edu

tent across studies.[4] These include the ability to:

- Search by keyword within the ebook content
- Print chapters or sections
- Download entire books or chapters
- Save chapters or sections to a device (usually a personal computer)

Zhang and Beckman's study of ebook usage in the sciences asked users about format preference.[5] An overwhelming majority of users preferred to read ebooks in PDF format (92%) versus in HTML format (12%) or on an ebook reader (8%). Readers' desires to download, print, and save the materials may influence this preference, as these functions are most easily performed with ebooks in a PDF format.

While the ability to download and print combined with ease of access are the main appeals of ebooks to the majority of readers, ebooks also provide enormous advantages to a special segment of readers: those with print disabilities. Print disabilities are visual, learning, or physical disabilities that make it impossible or overwhelmingly difficult for an individual to read from a physical book.[6] Visually impaired students are one group included in this category, but it also encompasses students with dyslexia, spinal cord injuries, and attention deficit disorder.[7] Visual impairment, the physical incapacity to hold a book, or an inability to focus can make ebooks a better solution for these patrons; however, not all academic ebook platforms provide the correct format and features they require.

The most important features are those that allow ebooks to work seamlessly with assistive technologies.[8] Text-to-speech converts written words to spoken words. Screen readers using text-to-speech technology are available for most computers (JAWS and VoiceOver are popular examples) and some ebook platforms offer proprietary text-to-speech software. Screen magnifiers enlarge the screen to make it easier for students who are visually impaired to read text and navigate web sites. This ability to zoom in on text can often be important to users with cognitive disabilities as well. To offer these technologies, ebooks must have the right type of file format, software interface, and document style. This means that an ebook can become *in*accessible in many different ways.

SJSU's Ebook Accessibility Project (EAP) was designed to test which academic ebooks were most accessible to disabled students. EAP was funded by the California State University System's (CSU) Affordable Learning Solutions initiative. This initiative works to give faculty and students greater access to quality free and low-cost learning materials. Frequently, these lower cost materials are online. Because the CSU is also dedicated to providing equitable access to all of its students, the accessibility of library ebooks, a free-to-students resource often used by faculty as assigned reading, is very important. For these reasons, EAP focused on testing ebooks against those features most disabled students use and rely on.

Methodology

With the assistance of the University Library's Technical Services department, 16 ebook platforms with sizable holdings available to SJSU users were identified:

1. ABC-CLIO
2. ACLS Humanities
3. Cambridge Books
4. CRCnetBASE
5. EBL
6. ebrary
7. EBSCO
8. Emerald
9. Gale Virtual Reference
10. IGI-Global
11. Oxford Reference Online
12. Palgrave Connect
13. Safari Tech
14. Sage
15. Springer
16. Wiley Online

Next, an evaluation template was created in consultation with the Directors of the CSU's Accessible Technology Initiative and SJSU's Accessible Education Center, which works directly with disabled students. This template included basic usability features as well as important accessibility features (Table 1).

TABLE 1
Evaluation Template

Feature	Functions Tested
Layout	Exact View; Page Reflow (content changes to fit the device being used); Zoom (range, increment)
Text Adjustments	Font Size; Font Color; Background Color; Font Style; Letter/Line Spacing
Search/Navigation	Table of Contents; Navigation; Search (Text); Hyperlinks; Page forward and back; Specify page number; Chapter/section forward and back
Annotation	Highlighting; Bookmarks; Text Notes; Audio Notes
Text-to-Speech	eBook content is readable by JAWS/VoiceOver; Text-to-speech available; Adobe ReadAloud (Only for PDF documents) can read document; Speed Adjustment; Voice Adjustment; Synchronized Highlighting (text is highlighted as it is read aloud)
Language Support	Dictionary; Pronunciation; Thesaurus
Media Support	Images (Can read caption and alternative text correctly. No alternative text for decorative images); Tables (Can read caption; recognize and read column and row headings; navigate in natural reading order to read cell contents)
Printing/Exporting	Platform-specific account or Adobe Digital Editions account required in addition to University sign-in; Section/Chapter/Percent of book that can be printed/downloaded; Print notes

These aspects of the ebooks were tested using several different hardware/browser configurations:

- Windows 7 Professional Desktop computer via the Mozilla Firefox browser version 31.0.
- Windows 7 Professional Desktop computer via the Internet Explorer browser Version 11.0.9600.17207.
- MacBook Pro running on OS X 10.8.5 via the Safari Browser version 6.1.1

Finally, ebooks were checked for a mobile/tablet application and mobile website compatibility for the platforms using an iPad 2 (2011 version).

Before beginning the evaluations, an attempt was made to locate official information on each platform's accessibility as made available from the publisher or aggregator. First, all vendors were contacted by e-mail a minimum of two times with a request for their Voluntary Product Accessibility Template (VPAT). The VPAT is a statement created by the vendor that demonstrates how their product complies with Section 508, a federal standard requiring government agencies to provide equitable access to information technology for disabled persons. Because they are created by the vendor and are not independently verified, VPATs can be variable in their usefulness.[9] However, they do demonstrate a commitment by the vendor to accessibility. If a VPAT was not provided, the researcher attempted to discover a webpage detailing accessibility.

Following this search for accessibility information, the evaluations began. For each evaluation, titles were picked at random from each platform and tested for each of the features listed in the table above. One of the main features examined for accessibility was the text-to-speech capability provided by the platform. If a proprietary text-to-speech feature was not offered, the screen readers JAWS 14.0 (Windows) and VoiceOver (iOS) were used to see if the content was accessible. For those platforms that provided downloadable PDFs either by chapter or for an entire title, the researcher used Adobe Reader's free built-in ReadAloud feature to see if the PDF content was accessible.

Occasionally, compatibility with screen reader programs was inconsistent among titles within a single platform. This usually happened with aggregator platforms; that is, platforms that included titles from

a variety of different publishers. When this happened, titles from the top five publishers on each aggregator platform were selected and tested.

Results

As part our funding requirements from the CSU Chancellor's Office, the full results of this study are available online at libguides.sjsu.edu/eap. These results are meant to inform libraries making ebook acquisition decisions as well as to assist librarians working with disabled students in choosing the best materials to recommend. A brief overview of the basic features offered by each ebook platform is available here in Appendix A.

Browser Compatibility: A general consistency existed among all three web browsers (not publisher platforms) used for the evaluations: Mozilla Firefox 31.0, Internet Explorer 11.0.9 and Safari 6.1.1. Minor differences in font styles and other minimal appearance aspects were identified as largely customizable through browser and device settings. Similarly, device security settings can affect the amount of user clicks needed to display content. Notably, viewing embedded PDF formats in Safari on a MacBook required constant additional clicking to bypass security warnings. Again, a change in browser setting would likely eliminate this problem.

Ebook Format: PDF (11) and HTML (9) represent the most popular formats available on the ebook platforms evaluated and some platforms offered both. Platforms also use EPUB (4), Flash (3), TXT (1), Kindle (1), and XML (1). PDFs, in conjunction with Adobe Digital Editions, provided the most flexibility to users in a number of areas. Adobe's Read Aloud feature can be used for almost any PDF with an Optical Character Recognition (OCR) format, regardless of a platform's text-to-speech capacity or the user's access to screen readers. (An "OCR'd" document is one that has been scanned so that the computer recognizes letters and words in order to form speech, rather than seeing the document as a single image.) Many downloading and printing options rely on protected PDF versions of the title to function. However, PDF restrictions may also be responsible for the limited note taking and bookmarking functions available, as none of the platforms reliant on PDF formats allowed these.

Text-to-Speech: In text-to-speech capabilities, a major benchmark in accessibility, a few platforms did very well. EBL and Gale make significant nods to inclusivity by offering an in-platform text-to-speech feature, making every title available to those with visual disabilities. Gale's TXT format is compatible with both JAWS and VoiceOver, the most common screen readers, and can be downloaded as an MP3 file.

Ebrary, one of the most prevalent ebook platforms in academic libraries, performed the poorest in this area. Ebrary does not provide a platform-based text-to-speech function, nor is its Flash format compatible with JAWS or VoiceOver. This oversight could potentially force some disabled users to rely on downloaded PDFs (not available for all titles) and Adobe ReadAloud to access the materials.

In some cases, we found inconsistencies within publisher platforms, particularly with ebook aggregators. A PDF must be OCR'd for any text-to-speech feature to work, be it platform-specific, a screen reader, or ReadAloud. Results testing PDFs from ebook aggregating platforms for OCR showed varied levels of compliance with this simple step toward accessibility. Some publishers added copyright watermarks to their PDFs for further security—a practice that interferes with screen readers' abilities to identify and read the text of a PDF.

Usability Features: Certain features reportedly desired by users are virtually universal among ebook platforms. Every platform evaluated offered a Table of Contents for each title; 15 of the 16 platforms made full text searching available for individual titles, ACLS Humanities being the exception. All platforms but Cambridge Books Online offered either font resizing or zoom capabilities for readers needing large text.

However, other useful features are not as ubiquitous as we would have liked. Only 56% (9 out of 16) allowed users to move to a specific page within the ebook. For users, especially those relying on screen readers, having to click or scroll forward or back-

ward for hundreds of pages can be frustrating. Five platforms allowed text note taking, with two (EBL and EBSCO) offering users the ability to take notes without logging into additional platform-based user accounts to do so—a requirement again particularly onerous for those relying on screen readers to navigate the myriad clicks and questions necessary to set up such individual accounts. ABC-CLIO and Gale Virtual Library both have bookmarking capabilities. Only Gale does not require an individual login.

Printing/Downloading: Readers may be surprised that all platforms allowed users to print at least the page currently on view once inside the ebook. A majority, 10 out of 16, provided users the option of printing specific chapters or sections, although some page limits or checkout requirements may apply. Only Springer allowed unrestricted printing of downloaded titles.

Downloading titles for offline use continues to be problematic. ABC-CLIO, Oxford Reference Online, and Safari Tech provide users no way to download even chapter- or entry-length sections of ebooks for use when no Internet connection is available. Ebrary, EBL, Emerald, and Palgrave offer entire book downloads in PDF or EPUB formats if the user goes through Adobe Digital Editions. Palgrave also offers users a Kindle edition. Springer again tops the usability charts in this area by allowing full ebook download without extraneous accounts (after the user has passed the normal library proxy servers, of course).

Conclusion

Frequent interface updates to online platforms make it difficult to provide accurate comparisons that remain relevant long-term. This study is a snapshot of platforms at a certain moment in time, and as such should be verified before acquisitions decisions are made. These results do reveal certain generalities in ebook platforms that can inform libraries and users:

- Single publisher platforms (such as Gale, Palgrave, and Springer) appear to offer more features and have more flexibility overall compared to aggregators (such as ProQuest and ACLS Humanities) that include books from a variety of publishers in their collections. Some single publishers, however, can be inconsistent (for example, IGI-Global).
- All the platforms tested allow at least limited printing of ebook content
- Few platforms allow for a complete download of the title, and the majority of platforms display titles by chapter or section rather than as a whole.
- Publishers provide extra features, especially printing and download functionality, for users willing to create personal accounts.
- Content is most commonly displayed in a PDF format. EPUB is sparingly used.
- Very few platforms actually offer a proprietary text-to-speech service.
- PDFs are sometimes readable, sometimes not, when accessed by the screen readers JAWS or Adobe ReadAloud. Even within a single platform, different publishers or titles may have less-accessible formats than others.
- Screen reader performance varies considerably as it may be affected by PDF formatting as well as the user's operating system, browser type, and browser version.

While the information presented here is as accurate as possible, additional challenges may exist for disabled students that we have not reported. The evaluation was performed by a graduate student from SJSU's School of Information with two years of experience working with patrons at the library's reference desk. This student has no known disabilities or specific accessibility needs. Further testing with students with variable needs will be conducted. Librarians responsible for the project have been in continued contact with SJSU's Accessible Education Center to find available students for such testing.

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Appendix A. Platform Evaluation Summary

	Content formats	Text Adjustments	Search/ Navigation	Annotation (Notes)	In-Platform Text-to-Speech Feature	JAWS & Voiceover Compatible	Language Support (Dictionary, Thesaurus)	Printing	Downloading
ABC-Clio	Embedded HTML	Font Size	ToC, Text Search	Bookmarks, Text Notes (individual login req'd)	N	Y	Dictionary	By Chapter/ Section	None
ACLS Humanities	IMAGE, PDF, TXT, XML	Zoom (IMAGE format only)	ToC, Page Forward/Back, Specify Page #	None	N	TXT, XML only	N	Per Page, Limit Unknown	10 Pages (PDF format)
Cambridge Books Online	HTML (specific titles), PDF	None	ToC, Text Search	None	N	Voiceover Only	N	By Chapter/ Section	By Chapter/ Section
CRCnet Base	PDF	Zoom	ToC, Text Search, Page Forward/Back, Specify Page #	None	N	Y	N	By Chapter/ Section	By Chapter/ Section
EBL	EPUB, PDF	Font Size	ToC, Text Search, Page Forward/Back, Specify Page #	Text Notes	Y	N	Dictionary	By # of Pages (checkout req'd)	Entire Book (checkout and download to Adobe Digital Editions req'd; not all titles available for checkout)
ebrary	FLASH	Zoom, Font Size	ToC, Text Search, Page Forward/Back, Specify Page #	Text Notes (individual login req'd)	N	N	Y	By # of Pages, Limit 60	60 Pages (PDF format); Entire Book (checkout and download to Adobe Digital Editions req'd; not all titles available for checkout)
EBSCO	PDF	Zoom (PDF)	ToC, Text Search, Page Forward/Back, Specify Page #	Text Notes	N	JAWS only	Dictionary	Varies By Title	Varies By Title
Emerald eBook Series	EPUB, HMTL, PDF	Zoom (PDF)	ToC, Text Search	None	N	HTML	N	By Chapter/ Section	By Chapter/ Section (PDF format); Entire Book (EPUB format - checkout and download to Adobe Digital Editions req'd)
Gale VRL	FLASH, HTML	Zoom	ToC, Text Search, Page Forward/Back, Specify Page #	Bookmarks	Y	TXT	Dictionary	Current Page	By Current Entry; MP3 Download Available
IGI-Global	HTML, PDF	Zoom (PDF)	ToC, Text Search, Page Forward/Back, Specify Page #	None (individual login req'd)	N	JAWS only	N	By Chapter/ Section	By Chapter/ Section
Oxford Reference Online	HTML	Font Size	ToC, Text Search		N	Y	N	Current Page	None
Palgrave Connect	EPUB ("Mobile Download"), Kindle ("Send to Kindle" feature), PDF	Zoom	ToC, Text Search, Page Forward/Back, Specify Page #	None	N	Y	N	Current Page or Section (PDF download req'd)	By Chapter/ Section or Entire Books (EPUB format); "Send to Kindle" Feature
Safari Tech	Embedded EPUB, FLASH, HTML	Zoom	ToC, Text Search, Page Frorward/Back	None	N	EPUB, HTML	N	Per Page, Limit Unknown	None
Sage Knowledge	HTML, PDF	Zoom, Font Size	ToC, Text Search	None	N	JAWS only	N	By Chapter/ Section	By Chapter/ Section
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Notes

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