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Tough Love: Guiding Student Researchers Toward a Better Future for E-Books

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Abstract

EPUB has emerged as the standard format for e-books due to its numerous advantages over PDF, including superior accessibility, enhanced navigation, lighter file sizes, optimization for mobile devices, and support for non-English languages, to name a few. However, there is little understanding of EPUB's advantages among end users and little appreciation for EPUB's potential in academic libraries. This paper provides a literature review and perspectives from a publisher, an aggregator, and end users (higher education library) about solutions that drive increased knowledge and use of the EPUB format for e-books in the academic library. It will summarize the reasons for EPUB's ascendance among academic publishers, explain how PDF e-books present barriers to innovation and real problems for accessibility, and argue that the scarcity of EPUB in the academic library is mostly due to a lack of awareness of its benefits. It will give librarians some ideas on how to begin integrating EPUB into research instruction, and ultimately, it will suggest that both librarians and vendors take an active role in shaping the habits and thus demands of their users.

Introduction

EPUB has emerged as the standard format for e-books due to its numerous advantages over PDF, including superior accessibility, enhanced navigation, lighter file sizes, optimization for mobile devices, and support for non-English languages, to name a few. However, there is little understanding of EPUB's advantages among end users and little appreciation for EPUB's potential in academic libraries. Research has shown that most users don't recognize the EPUB format and prefer PDF due to its familiarity. This puts publishers and vendors in a difficult situation: continue to deliver PDF content at an increasing cost, both financial and in terms of usability, or risk turning users away by forcing them into an unfamiliar format?

Nomenclature and Background

While other e-book formats exist, this paper focuses on PDF and EPUB formats, because those two formats are most relevant to the academic research workflow involving e-books.

PDF

Portable Document Format, or *PDF*, was invented by Adobe Systems in 1992 and (as of 2008) is maintained as an open standard file format by the International Organization for Standardization (ISO) (Adobe Systems, 2015). PDF editing software is, however, proprietary and maintained by Adobe. Most PDF files are designed to be "flat documents," which means that you see the layout of the document exactly as its author intended, including print-corollary pagination. Variations of the flat PDF include options to make a document accessible, embed multimedia content, and create fillable forms (all options requiring the use of Adobe's proprietary software). PDF is a common file format due in some part to the ease of formatting from common document editing software, such as Microsoft Word, and the polished appearance of the final document.

EPUB

According to the International Digital Publishing Forum (IDPF), the organization responsible for standards related to electronic publishing and

content consumption, EPUB “is the distribution and interchange format standard for digital publications and documents based on Web Standards” (2015, par. 2). Initially released in 2007, the IDPF released EPUB version 3 (EPUB3) in 2011. EPUB provides a user with a number of features that are focused on the accessibility of a web-based electronic document through the integration of Web standards such as dynamic linking; adjustable font size, background color, and text; integration of accessibility standards; searchable images, formulas, and tables; support for non-Roman languages; and integration of audio, video, and quizzes (version 3). EPUB’s most visible (and differentiating) feature is its reflowable text, or optimized display, which resizes the document to fit screens for a variety of devices.

The Case for Accessibility

Accessibility is a key issue in the publishing world and, specifically, publishing in higher education. Section 104 of the *Code of Federal Regulations* (2000) stipulates that academic materials required for courses must be made accessible for all students. Accessibility is not limited to readers of Braille, but also readers with other visual impairments as well as motor impairment or cognitive challenges (Bide, 2014). Technological advances provide the means for publishers and aggregators to provide enhanced or alternate versions of materials more quickly and efficiently than print variations, in large part due to the advent and use of PDF and EPUB for material delivery to end users. However, while accessibility tools are available in the development of both PDF and EPUB files, the integration of accessibility features is not automatic; rather, the creator of a file must specifically leverage accessibility markup and specifications in a file. Only a PDF generated with accessibility checks through Adobe Acrobat Pro provides a user with options to include alternate text for figures, specified languages for text, character encodings, and a structure tree that references all document content (Adobe Systems, 2004). EPUB, on the other hand (specifically EPUB 3), provides the file creator with options to integrate enhanced navigation, add textual descriptions of illustrations, adopting

MathML for typesetting equations, global language support, and rich media and hyperactivity. EPUB 3 also integrates the accessible DAISY format—the audio format standard for “talking books.” As a result of these accessibility integrations in EPUB and the ability to implement integrations without the use of proprietary software, the Association of American Publishers (2013), the DAISY Consortium (2015), EDitEUR (2014) and others support the use of EPUB for e-book publication over PDF.

EPUB Perspectives

Despite the many superior qualities of the EPUB format, and the fact that virtually all academic publishers are producing it, EPUB runs a distant second to PDF in terms of usage in academic libraries and delivery from academic e-book vendors. The authors provide perspectives on the challenges and opportunities for integrating EPUB in the academic research workflow from the publisher, aggregator, and end user (higher education library), and offer potential solutions from these three critical perspectives.

The Publisher

The publisher perspective outlined here is that of Elsevier’s Science and Technology Books portfolio, which publishes academic reference content in print and digital formats to support advancement of research science. Elsevier began creating EPUB files for books in 2010, mainly in an effort to meet the needs of several retail channel partners with proprietary e-readers. Elsevier saw an uptick in retail sales to consumers when content was made available, which gave evidence to a growing need for content optimized for mobile devices in the research community. Elsevier then began converting backlist titles to EPUB that were previously only available in PDF, so the available catalog could be as broad as possible and allow a consistent experience for users. The benefits to EPUB in the research community were clear—text that is reflowable and can be resized based on screen size allows a researcher to easily access the same book on their PC, tablet or mobile device through the reader of their choice, and offers a more streamlined workflow which no longer confines them to their desk when using book

content, or requires them to struggle with a PDF that is not easily viewed on a mobile device in the field.

In 2013 when EBSCO and other library aggregators began accepting EPUB as a supported file type, it further advanced the possibilities for the use of this content in research and helped drive the return on investment that Elsevier and other publishers have put into making this content available in the academic market.

In addition to the simple—but impactful—improvements that EPUB allows publishers to bring to the traditional reading experience, it is also important that publishers look into how best to support additional accessibility features. Some of the most forward-looking features of EPUB, and particularly the most recent EPUB3 standard, include things like adding textual descriptions to images and nontext elements. Similarly, adding interactive elements like charts and graphs that allow for data input, question-and-answer quizzes inline with text, and multimedia video are all part of the future landscape for scientific book content. One of the challenges however, is the limited rollout on the vendor side with regard to functionality with EPUB 3. Publishers would be in a better position to leverage these tools if all vendors, whether serving library or consumer markets, would rally behind support for EPUB3 functionality. There is the ability to gracefully downgrade an EPUB3 file so any reader only renders what it's capable of without creating a rift in the user experience. But in order for our industry to fully embrace the technologies available to us, more support is needed from the broader reseller marketplace that is hosting and delivering this content.

The Aggregator

The e-book aggregator perspective outlined here is that of EBSCO Information Services, which began integrating EPUB format e-books in the spring of 2013. At that time, EBSCO anticipated an inevitable transition away from the PDF format because of its many limitations. For trade content, the case for EPUB is simple, since the primary use case is offline, on a mobile device and the

reflowable content is a near necessity. But for e-books in the academic library, where the primary use case is the online research workflow, the benefits of the EPUB format are lesser known. Academic monographs in EPUB format are full of rich, intratextual linking between sections and to/from end-of-chapter references, and they contain hyperlinked indexes and links to the open Web. They operate like and integrate with Web content, which makes online research using e-books much more efficient. They are also, for the most part, made highly accessible. So in light of the benefits to end users and the near-universal adoption of EPUB by publishers, EBSCO released an online EPUB viewer within the EBSCOhost platform, which is comaintained with the existing PDF viewer. Thus, the EBSCO engineering team is maintaining two platforms for e-books, so every feature has to be built (defined, planned, coded, tested, and released) twice. Sometimes this means equal time and resources for each format, other times there is substantially more effort involved with the PDF feature because the technology is so outdated. Initially, EBSCO accepted the dual format/dual platform situation with the hope that the EPUB viewer would soon displace the PDF viewer as the premier research platform, while the PDF viewer could be maintained at a basic level for backlist e-books or anything for which an EPUB version was unavailable.

But despite the initial optimism, EBSCO has been unable to retire support for the PDF viewer, and due to typical resource constraints within a software platform, it has been unable to fully develop the potential available for EPUB content. With each software release, EBSCO must allocate available resources across two platforms, which necessarily limits the rate at which it can develop for EPUB features. (Additionally, which such heavy use of the PDF content, EBSCO is unwilling to let the user experiences diverge beyond a reasonable amount). Other academic vendors have chosen to forgo an online EPUB experience all together. In short, because of the academic community's attachment to PDF e-books, EBSCO and others have been limited in the number of advanced EPUB features it has been able to introduce.

Why has EBSCO not forced the choice on its users, as consumer sites have done? First, as an aggregator, EBSCO has to support a range of market segments and user populations: technology-savvy users on one end of the spectrum and on the other, users still adjusting to e-books in general. Second, aggregators generally follow trends in scholarly research and introduce features based on demand—if enough researchers require integration with a certain citation management tool, aggregators will comply. But rare is the case where the aggregator is dictating the research trend—e-book aggregators generally don't have enough prominence in the scholarly research universe. And most importantly, EBSCO's users haven't yet gravitated towards EPUB in any statistically significant numbers. As recently as October 2015, EPUB use among EBSCO's academic customers accounted for just 6.28% of overall EBSCO e-book usage, and just 7.42% of total downloads.

To understand the reasons for the low usage of the EPUB versions, the researchers looked to data gathered by EBSCO's user research team on full-text linking and student research habits. In a study called "Library-ese," a survey of 208 US undergraduates designed by EBSCO's user research group to probe what library and research terminology students do and don't understand, the researchers found a remarkably high level of recognition with the PDF icon and acronym. This survey, along with several usability tests, have shown that students are not always sure which links take them directly to the full text in their information products, but that PDF represents a reliable and familiar choice. Seventy-two percent of students surveyed believed that clicking "PDF" provides them immediate access to full text, while HTML, e-book, and EPUB were selected at a much lower rate for providing immediate access to a full-text e-book (Lawrence 2015). In a related usability study, only 13% of students correctly guessed what EPUB is in a multiple choice question (Gambrell 2015). What Khalilah Gambrell, EBSCO Technical Product Manager for e-books, found anecdotally is that students think of "e-book" as the format and do not necessarily know or care about the difference between types

of e-book formats. This presents a challenge for EBSCO as an aggregator. It would be easy to consolidate the e-book link to the EPUB version, where available, but until librarians understand and support that decision, EBSCO is hesitant to force that transition on them.

Another challenge for EBSCO as an aggregator is that publishers support different versions of EPUB (2.0 and 3.0), and those that produce EPUB leverage the navigation with varying degrees of elegance. Most publishers anchor links to chapters, so that if there is a reference to, say, "Chapter 9," the user can select that reference and be taken to that chapter. Many publishers also support links to end of chapter references, but comparatively few publishers link back from the end of chapter reference to the point in the book where the user left off. This two-way linking is where the biggest research efficiency is gained—so that users can check a reference and then "flip" back to their place in the book and not lose the integrity—or the flow—of what they were reading. EBSCO is undertaking efforts with publishers to encourage them to fully exploit EPUB advantages and partner to deliver best-in-class research experience.

Soon, aggregators must decide when and whether to establish the EPUB version as the primary e-book and begin to deprecate PDF support in favor of robust EPUB support. Continued research with end users and the promotional activities outlined in this paper should help make that decision more clear in the coming months.

The End User

The end user studied in this publication is a private college with program offerings in six schools (business, design, early childhood education, health sciences, nursing, and technology), operating residentially in five states and online. The three-part study focused on EPUB perceptions of college students as well as the faculty and staff who support college students through either curriculum and design or direct instruction. The study administrator (assistant vice president of academic support at the college)

poses that in a higher education setting, many of the benefits of EPUB outweigh its PDF counterpart, including:

- Students and faculty more frequently connect to library resources on mobile devices; optimized display makes it easier for students to move from tablet to phone to desktop without compromising readability
- EPUB's features support accessibility needs in higher education classroom settings, especially virtual classrooms or courses in which electronic materials are required
- Dynamic text and multimedia integration make a once-static text interactive and engaging, providing the reader (student) intrinsic incentive to complete the material

Despite this improved functionality, users are reticent to select an EPUB file over a PDF file when provided with the option, because PDF is more recognizable. In partnership with EBSCO (its primary e-book provider), the college measured its e-book use by format selection and discovered that in peak usage periods, PDF full-text views numbered nearly 8,000 while EPUB views in the same period numbered less than 1,000. Through its library administration, the college sought to change EPUB perception through three channels: curriculum integration, faculty development, and student marketing and training.

Curriculum Integration

The college curriculum is supported by curriculum and instruction (C&I) team and course design teams that are tasked with partnering with school and programmatic leadership as well as subject matter experts and academic support personnel (including librarians) to develop outcomes and curricula for courses and programs. At the course level, librarians are tasked with liaising with the C&I team to integrate library resources in courses as required or supplemental reading material, and then working with the course design team to ensure that library resources are appropriately linked within courses. Prior to this study, librarians

as well as the C&I and course design teams placed no prioritization on EPUB resources: since as much as 75% of e-book usage at the college stems from course integration, the potential to improve EPUB usage as a result of changes in prioritization is significant. The library administrator provided training to both the C&I and course design teams on the value of EPUB (usability, accessibility) and instructions on identifying resources within the college's databases that are available in EPUB format. Beginning with new and revised course designs in fall semester 2015, the teams will prioritize resources with EPUB format if they fit other criteria for materials selection, and the library administrator will remeasure format selection to identify shifts in use.

Faculty Development

Resource selection for college courses is typically directed or at least guided by the faculty teaching those courses. As such, faculty play a critical role in the integration of library resources in course curriculum as well as the use of resources by students for assignments. In September, 2015, the study administrator hosted a faculty development session presented by EBSCO, its primary e-book aggregator. The session focused on the differences between EPUB and PDF, the value of EPUB, and opportunities for faculty to connect students to resources in EPUB format using the searching and linking tools in the college's library databases. A few weeks after the presentation, faculty ($n = 58$) were asked to complete a survey about EPUB; 7 faculty responded. The faculty who had an opportunity to try EPUB prior to or after the survey were positive about EPUB features but also identified a need to receive additional training on the availability and features of EPUB. The number of faculty who participated in the session and subsequently completed the survey is a small sample; the author plans to repeat the session during future faculty development and offer focus sessions to gather additional data.

Student Training and Marketing

Students are the primary users of library resources and typically require significant exposure to and training on library resources to become adept at use for research. The study

administrators provided a free webinar on EPUB format to student tutors at the college. The tutors were not required to complete the training but were offered compensation (tutors at the college are paid for completion of any duties-related training). Following the training, participating tutors were asked to complete a survey about EPUB features. Of the 10 students who completed the training and the survey, 6 tried EPUB resources after the training was complete, which suggests that the mere exposure to format training increases the likelihood of use of EPUB use. Additionally, 80% of students surveyed somewhat agreed or strongly agreed that they are “more likely to select EPUB as my first choice of format for future online research” and that “EPUB makes my online research more efficient.” Ninety percent of students who completed the survey either somewhat agreed or strongly agreed that they would “definitely select EPUB books” for pleasure reading and for research. While the sample is small, results correlate to a positive impact on training to improve EPUB use by students.

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Conclusions

The e-book publishing and aggregation market continues to change as use cases in public and academic markets change. In some instances, even the concept of a “book” is changing: where a course may have once required readers to purchase and read an entire text, students are now provided with or required to purchase a bundle that includes pages and chapters of a variety of articles and books as well as videos and other multimedia content. This evolving landscape, combined with the introduction of and improvements to increasingly inexpensive mobile devices, makes the EPUB format a particularly attractive resource. The literature and our studies suggest that while some use-case scenarios may require PDF availability, a more proactive approach to format selection includes extensive training on the features of EPUB for end users and extensive integration in courses where e-books are utilized as required or supplemental materials. The researchers hope that with the increase in demand, better availability and support across academic platforms will follow.

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