Why E-Textbooks Matter

Digital textbooks (or e-textbooks) are hot commodities in higher education, with numerous colleges, universities, and educational coalitions adopting various platforms, piloting options, or cautiously monitoring developments. The 2010 Horizon Report projected digital textbooks would be widely adopted by higher education within two to three years.¹ The 2011 Horizon Report advanced the timeline to one year or less.² This swelling tide of interest in e-textbooks arises from a number of motivators, principally to save students money, explore pedagogical potential, and keep pace with K–12 markets.

For instructors, there are additional benefits to considering e-textbooks. Instructors are looking for ways to keep materials current while responding to the price pressures their students face. Many teaching decisions center around reading materials as a basis for lectures and lecture notes, slides, quizzes, and assignments. Textbooks can supplement lectures and allow an instructor to provide more information on specific areas that a class is struggling with, rather than simply covering the breadth of the content equally. E-textbooks, which can offer lower rental rates and feature a more innovative format than hard-copy versions, can be an appealing option to meet these needs. Additionally, more students are being exposed to e-textbooks in K–12 courses. In her keynote address at the 2012 EDUCAUSE West/Southwest Regional Conference, Julie Evans presented research strongly indicating that, as “digital natives,” increasing numbers of students leave high school expecting to have access to e-textbooks at colleges and universities.³

Clearly, e-textbooks are an emerging technology that has the potential to change the landscape of higher education. Are current e-textbook platforms ready for widespread adoption? Do they meet instructor and student needs? Do they live up to the hype? The answer to all of these questions is the same: not yet. But with targeted effort, they can be there soon.

The University of Washington’s E-Textbook Pilot

The University of Washington (UW) is a world-renowned research university, with more than 50,000 students currently enrolled across three campuses in Seattle, Bothell, and Tacoma. More than 1,800 undergraduate courses are offered annually within 16 colleges and departments. UW Information Technology (UW-IT), the central technology unit, provides instructors and students with robust, innovative, and flexible technologies that meet their diverse teaching and learning needs.

About the UW Pilot

In 2009, the UW’s Department of Computer Science and Engineering and the Foster School of Business piloted the use of Kindle devices to deliver course readings but found significant impediments in the reading experience and note-taking options.⁴ A 2010 pilot at Indiana University focused on using a web-based e-textbook platform to aggregate content from a variety of major publishers,⁵ an approach that had the potential to address many of the shortcomings found in the UW’s initial pilot. Therefore, the UW decided to pilot the two leading web-based e-textbooks platforms, Courseload and CourseSmart, during 2012–13.

The pilot was led by UW-IT with assistance from the University Book Store, UW Libraries, and faculty and staff on the Teaching and Learning Technology Oversight Committee. The pilot assessed Courseload and CourseSmart to determine which platform participants preferred. Courseload emphasizes collaborative reading features (including note-sharing...
among students and between the instructor and students), based on a system in which all the students buy the e-textbook as part of the course. In contrast, CourseSmart does not require all students in a course to purchase the e-textbook and emphasizes student choice in the length of time they rent the e-textbook. Participating instructors taught with their choice of e-textbook and selected the platform they preferred; they were not required to use the e-textbook in a predetermined manner.

During the pilot, students received their e-textbooks free of charge; UW-IT covered the cost of e-textbooks. Access to the e-textbooks was provided through integration with the Canvas learning management system, which was also in a pilot phase at the UW at this time. As a result, some participating courses only used Canvas to access the e-textbook.

Pilot Evaluation
The UW pilot had substantial breadth, with participating courses representing a broad range of academic areas, levels, and sizes. The 20 participating courses, representing all three UW campuses (Seattle, Bothell, and Tacoma), were taught by 17 instructors and had a total enrollment of 1,859 students. UW-IT conducted structured interviews with participating instructors at the end of each quarter, focusing on their experience teaching with this new resource. Thirteen instructors participated in interviews, for a response rate of 76.5%. Students were surveyed during the final weeks of each course about their reading habits, experience with the e-textbook, and priorities for the future. A total of 728 students responded to the surveys, for a response rate of 39.2%. The pilot also included a comparison of the same course, with the same instructor, using different e-textbook platforms during subsequent quarters, as well as a comparison between courses with high instructor use of collaborative features and courses with little or no use of collaborative features. A full report of the pilot findings is available online.

In the two-year pilot, the UW found that e-textbooks had limited impact on teaching and learning. A comparison of the platforms found that both performed below expectations in several key areas: price, innovation, mobility, access, and integration. These limitations hinder broad adoption and impede the potential of e-textbooks to transform education. The UW pilot findings are important for two reasons. First, they provide the higher education community with knowledge gained from a robust evaluation across an array of course levels, sizes, and disciplines. Second, instructor and student feedback reveal five areas where improvements are vital to future e-textbook adoption. Future e-textbook efforts will benefit greatly from:

- More competitive pricing compared to print textbooks
- Technology that moves beyond fidelity to the printed page
- Real anytime, anywhere access—for everyone
- Greater availability of books and other digital resources
- Integration into the larger digital learning ecosystem

Participants
As noted, the pilot covered a diverse group of students in various academic disciplines, in courses of varying sizes and levels.

Pilot Courses
The 20 pilot courses were distributed across campuses, disciplines, sizes, and levels (Figure 1).
Student Demographics

The 728 students who responded to the survey represented a range of class standings and came from courses both within and outside their majors. More women than men completed the survey. Respondents also tended to expect high grades in pilot courses (Figure 2).

Students’ Textbook Purchasing Habits in General

Students indicated how they would have acquired (or not acquired) the text for the course if an e-textbook had not been provided to them. Most would have bought a hard copy, but 17% reported they would not have used the book at all (see Figure 3). Some students did not feel that the textbook, regardless of print or digital format, was necessary for their success in the course perhaps due to other available resources such as detailed lecture slides or an extensive course reader.

Students’ Reading Style

We asked students to rate their reading from 1 to 5 as passive (1) to active (5) and individual (1) to social (5). Active reading habits were described as highlighting, note taking, and outlining; social reading habits include sharing passages with others and discussing ideas found in the text. Overall, students rated themselves as intermediate between active and passive (mean 3.09) and as intermediate to nonsocial (mean 2.38).

Findings: Five Things to Consider as E-Textbooks Evolve

Based on student surveys, faculty interviews, and our experience in UW-IT supporting and managing the pilot, we identified five key areas where e-textbooks need improvement to meet student and instructor needs. Each area is summarized below, along with corresponding data. As e-textbooks improve in these areas, they will become promising candidates for widespread adoption.

1. Price Matters

To satisfy the needs of instructors and students, e-textbooks need to offer a significant cost savings over hard-copy textbooks. Participants were interested in the pilot primarily because of the potential for cost savings, and they considered a low price to be their top priority in evaluating any platform. During the pilot, UW-IT found that the average discount available in an e-textbook rental was around 40% less than the price of a new hard copy, although this varied by platform and e-textbook. Other studies, such as those at Daytona State College, have found that publishers’ pricing decisions in...
several cases saved students at most a dollar compared to buying a new hard-copy textbook and reselling it at the end of the quarter.7

**Price Is the Top Priority**

Price was the most important e-textbook factor for instructors and students. On surveys, students were asked which factors are most important for the UW to consider when determining the future of e-textbooks. On the 8-point scale, 73% of participants ranked amount of discount as their first or second priority, while only 5.5% of participants ranked it as one of their lowest two priorities (Figure 4). These results were consistent with students’ write-in comments about what they liked best about the e-textbook, which overwhelmingly cited the fact it was provided for free. Faculty were also concerned with the rising costs of textbooks. For one professor, the price of a textbook was her “first consideration” when choosing a text. She also said the price of one of her favorite textbooks was so expensive that she was too “embarrassed” to require it for her students. Another professor said that the rising cost of textbooks was due to “pure greed,” and a major motivator for his participation in the pilot was the fact that his students would get a free e-textbook.

**Perception of Value**

Students were asked how much an e-textbook should be discounted compared with the hard copy version for them to perceive it as a “good value.” Their responses support the results reported above—price matters (Figure 5).8 Although these results may be indicative of students’ preferences for reading from a hard copy, they also show the importance that students place on value when choosing a textbook. Courseload’s model emphasizes collaborative features. In order to support this model, Courseload requires that all students in the class purchase the e-textbook. The survey asked students how they felt about being required to pay for the book, at a discounted cost, via a course fee. More than three-quarters of students (78%) reported being “very
unhappy” or “unhappy” with this arrangement, and only 22% were “happy” or “very happy” with this system.

**Looking Forward**

Several instructors commented on the role of textbooks within a repository of materials for students, including video, lectures, assignments, and other resources. As such, a high effort was associated with changing a textbook because of the need to reevaluate the other materials in the collection and the resulting adjustment of lecture notes. However, the rising price of textbooks has led faculty to shoulder this burden to find less expensive options for their students. Faculty frequently respond to these pressures by turning to course packs that include articles and chapters instead of whole textbooks because adjusting any one piece of these materials has a smaller impact on the whole learning environment. Whatever e-textbook options institutions pursue, they should take into account both the time and effort of faculty and the price pressures felt by students. Options that charge traditional textbook prices, or even substantial fractions of standard prices, will need to add very significant value for faculty and students. E-reserve systems and open-source content may also address some of the price pressures instructors and students face.

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**2. Watch for a Move beyond the Printed Page**

The primary limitation of the e-textbook platforms the UW piloted is that they focus on fidelity to the printed page above other considerations, which keeps them from taking full advantage of an interconnected and responsive online world. This emphasis on page fidelity meant that in most pilot courses the e-textbook served as a direct substitute for the printed book, rather than as an enhancement or innovation. Largely due to the limited vision inherent in this approach, e-textbooks had minimal impact on students’ learning experience. Students placed the most value on a few key areas where the e-textbook offered features that improved upon printed books without replicating options found in other course technologies. To reach their potential, it is essential for e-textbooks to take better advantage of the affordances of the digital format and break the limitations imposed by the printed page.

**E-Textbook vs. Hard Copy**

On the survey, students indicated their preferences for completing various activities with an e-textbook or a hard copy (Figure 6). Students preferred e-textbooks for activities involving searching, sharing, and cross-referencing. These

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**Figure 6. Students’ Preferences for Completing Various Tasks with an E-Textbook or Hard Copy**
activities take advantage of the digital format and offer enhancements over the printed page. However, students preferred hard copies for reading and individual note-taking activities. These data suggest that e-textbooks have the most potential to enhance the learning experience when they offer new options beyond what is available with a hard-copy book. These patterns were similar with Courseload and CourseSmart, emphasizing the similarities of students’ experience with both platforms.

The majority of student participants only used the e-textbook that was provided to them, but—given concerns about price—a surprisingly large minority purchased a hard copy to use instead of or alongside the e-textbook (Figure 7). Students’ main reasons for purchasing the hard-copy textbook included disliking the reading experience with the e-textbook and wanting longer-term access to the book. The latter reason was particularly common for upper-level students taking courses in their majors.

**Looking Forward**

As increasing numbers of platforms begin to offer a flexible reading format—such as those employed by the Kindle, iBook, and other systems—the reliance on page fidelity (mainly to preserve page numbers) should ebb. Ideas of using content on massive open online courses (MOOCs) instead of textbooks, along with experiments in video, simulation, and quizzing integration, suggest further possibilities for enhanced individual reading. Once e-textbooks embrace the full capabilities of digital formats, the possibilities are extensive and may even be transformational. However, in moving to more interactive e-textbooks, it is important that the quality and substance of these resources be high: Content remains vital. One faculty member commented, “The substance of the books with all the interactive features has to be just as good. There are interactive feature[d] books available, but the substance isn’t as good. Material has to be solid first. But right now it is the opposite.”

**3. Focus on Anytime, Anywhere, Any Device, for Everyone**

The focus on page fidelity, along with tight digital rights management (DRM), greatly limits the use of e-textbooks on mobile devices and tablets. Both Courseload and CourseSmart can be accessed by any device with a modern web browser while students are online (CourseSmart also has a native iPad app). Even though Internet access is increasing, it is not yet ubiquitous, and students struggled with offline access options. During the pilot time period, neither platform offered a seamless experience when moving between devices, such as users typically experience when using a variety of digital reading apps (e.g., Kindle, iBooks, Google Play). These limitations hinder the usefulness of e-textbooks for most users beyond what is reasonable in a mobile and digital era. DRM control limits the ability of students with disabilities to have any meaningful access to the text or to be able to use it as smoothly as options already available through disability resource centers. Improvements in these areas are essential for e-textbooks to be viable educational options.

**Ease of Use**

For most activities—accessing the e-textbook, managing privacy, and sharing notes—students found both e-textbook platforms easy to use. However, the two areas where students encountered difficulties, mobile use and offline reading, greatly hindered the portability of reading materials (Figure 8). Courseload usage data indicate that of 76,752 pages viewed by participants during the pilot, only 107 were viewed offline. In write-in comments, students found offline access for both platforms “impossible,” “a nightmare,” and “very difficult to set up.” Reading offline with mobile devices, especially tablets, posed many challenges. One student told us, “I saw how useful the text was from the electronic version, so I purchased a [printed] copy to use when my iPad was offline.” In write-in comments,
students remarked on “screen fatigue” and “eye strain” from completing reading online. Another student observed that strict DRM in e-textbooks contributes to a reading experience that is “obnoxious, paternalistic, and unintuitive.”

### Accessibility

Neither Courseload nor CourseSmart performed well in accessibility tests prior to and during the pilot. Courseload initially offered an interface and content that was almost completely inaccessible to users with disabilities, whereas CourseSmart had an interface that required a student with a disability to request an “accessible version,” which was primarily geared toward users of screen readers (users with visual disabilities) with “invisible” or remediated text. Over the course of the pilot, both vendors offered minor, incremental improvements in accessibility; however, neither vendor’s offering could be considered to provide equal access to all students.

### Looking Forward

Other existing e-textbook systems with more robust mobile offerings, such as Inkling and iBooks, currently limit students to iPads for access to their textbooks, although they offer increased interaction with video and quizzing. These solutions move away from anytime, anywhere access to a hardware-dependent solution that does not resolve the issues of access being tied to a single technology. Universities and colleges should specifically watch for future solutions that allow multiple ways of accessing the e-textbook. In this regard, the open and Creative Commons textbook options are particularly attractive, as the lack of concern for textbook rights allow students to access their e-textbooks in whatever form, and on whatever device, they prefer.

### 4. Pay Attention to Market Saturation and Access Options

Usability and feature enhancements to e-textbook platforms and price reductions will not help students whose textbooks are unavailable in a digital format. We were surprised to find the high number of books not available as e-textbooks. Although some e-textbooks have been available from the University Book Store for a while, we found that students did not often choose to purchase e-textbooks.

### E-Textbook Availability for Pilot Courses

During the pilot, e-textbook availability was a considerable challenge. Even though both vendors had relationships with major publishers, many textbooks simply were not available as an e-textbook. Several interested instructors were not able to participate in the pilot because the textbook they wished to use was not available. This was particularly true of textbooks in humanities courses, where instructors were interested in collaborative reading and discussion around specific texts and eager to use more interactive e-textbook features.

Even when textbooks were available electronically, they required substantial time to procure. The pilot’s project managers, support personnel, and sponsors all were involved at various times in contacting and negotiating with publishers. Silos at publishing houses

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**Figure 8. Students’ Rankings of E-Textbook Features for Their Ease of Use**
made it particularly difficult to hold these negotiations because, at times, our contacts there were unable to direct us to the person or people who controlled electronic publishing rights. Textbook acquisition was the most significant support burden of the pilot and dramatically increased the total cost in terms of employee time, even for a pilot that only included 20 courses, most of which used just a single e-textbook.

In addition, the e-textbook platforms we piloted did not focus on access to articles and course packs, which the pilot study found to be used extensively in the UW context. While Courseload had an option to upload additional files, instructors who experimented with this option found it limited and cumbersome in its current implementation. However, this type of feature merits further development.

**E-Textbook Availability in General**

The University Book Store has a long-standing arrangement with CourseSmart to offer e-textbooks as an option for students outside the pilot. The bookstore has also found that market saturation is low, with a small percentage of titles available for each campus, and student selection of a digital option is even lower, accounting for less than 1% of total textbook sales.

**Looking Forward**

We found that relationships with publishers were not a reliable measure of e-textbook availability. Working closely with university bookstores and library systems to handle relationships with publishers to gauge textbook availability is essential. Until more textbooks are available in a digital format, e-textbook adoption will remain limited.

**5. Think of the E-Textbook as Part of a Larger Learning Ecosystem**

Finally, our pilot data suggest that it is important not to think of an e-textbook as a stand-alone option but to focus on the integrations and connections possible within the learning ecosystem. It is vital to consider a variety of content types: YouTube videos, PDFs, instructor/student written content, existing discussions within a learning management system, open-source content, aggregated segments of textbooks from a variety of publishers, PowerPoint slides, multimedia, and high-quality diagrams. The more all of these course components work together, the more comprehensive and cohesive the system becomes.

**The Role of Reading in Pilot Courses**

Across the courses in the UW pilot, the role of reading varied considerably. In some, the e-textbook was the central component of the course, with all lectures, exams, and activities centered on the assigned reading. In others, the e-textbook was primarily a reference resource. Instructors supplemented e-textbooks with slides, lecture notes, additional readings, and/or multimedia resources.

**Student Perception of Course Reading**

We found an association between the amount of reading students completed and the amount they believed was necessary to succeed in a course, but this amount varied considerably (see Figure 9). Students tended to review lecture notes (their own and/or those provided by the instructor), slides, and other materials in addition to or in place of reading the e-textbook.

This pattern held consistent even in courses where faculty placed a high emphasis on reading the textbook, drawing quiz and exam questions from the text.

**Comparison of E-Textbook Platforms**

While several instructors gravitated toward using Courseload over CourseSmart because of the collaboration features, pilot results show these features were seldom used. Even among instructors who taught more than one pilot course with these technologies, collaboration was not a priority. The main reason instructors gave for not using interactive features was the amount of time required to mark up a text and share notes with students. In the 11 courses that used Courseload, only one course had more than three notes shared by the instructor with students. While that one course had 150 shared notes, six courses had none. In interviews, instructors observed that they already have robust feedback and interaction mechanisms in place for their courses and that they did not need one more place to check for questions and comments. Rather, they would prefer that the e-textbook platform had close integration with the learning management system and other course tools.

Even in the one Courseload course where the instructor made 150 notes, a substantial majority of students reported “no change” to their level of interaction with the instructor. The same was true, although to a slightly lesser extent, in other Courseload courses where the instructor made little or no use of collaborative features and in CourseSmart
He indicated that e-textbooks should instead focus on providing rich “interactions between e-textbooks and other readings and online resources.”

Looking Forward

Extensive work has been done and is continuing to be done to create online discussion and course interaction options in most higher education courses. Several pilot instructors commented on the fact that their class already had online discussions around the reading, but those discussions were not

Courses where sharing features were not prominent (Figure 10).

Surveys also asked students to indicate the effect e-textbooks had on their interaction with their classmates. The responses for both platforms were very similar, with an overwhelming majority of students citing “no change to interaction,” regardless of the field or importance of the text in the course (Figure 11).

According to a science instructor who tried both platforms, students did not use the interactive features because the type of interaction that Courseload was attempting to promote was “the wrong kind of interaction.”
taking place within the e-textbook platform. Technologies are more attractive to instructors if they do not duplicate other systems but rather work with them. One faculty member expressed bewilderment that, although a normal web page can contain a YouTube video, a short survey, and a section of text and images, his students could not currently move seamlessly between learning experiences in the learning management system, lecture capture, and the e-textbook system. He envisioned a system where video, text, quizzes, and other resources could live alongside each other and share information. Innovations in integration would be desirable in an e-textbook platform, reflecting pressures toward interoperability in other forms of technology.

**Conclusion**

The e-textbook market is evolving as new players and new options enter this space and as current leaders continue to enhance their products. Educators, publishers, and students anticipate that the future of textbooks and course readings will be digital. *Campus Technology* recently reported that students are “increasingly comfortable with e-texts,” mainly due to students’ expanding use of mobile devices for education and stated interests in having more readings and course materials available online. As the issues articulated in this brief are addressed, including greater options for mobile use and integration with other online resources, e-textbooks will become a more desirable option for widespread adoption. In the meantime, it makes sense to focus on targeted adoption areas where availability and interest already exist.

Continued experiments are necessary as campuses work in targeted areas of adoption. The Washington State Board of Community and Technical Colleges is managing the creation of Creative Commons textbooks, which, born digital and loose on DRM, may help resolve page-fidelity limitations. Textbook start-ups such as Boundless are exploring supplementary and integrated videos, quizzes, and flashcards. With more advanced research projects, such as the Implementing New Knowledge Environments project and others, there is no shortage of new things to try. Though e-textbooks are not yet ready for prime time, their potential is extensive and the technologies necessary to recognize this potential are largely already in place.

In higher education, we have a unique opportunity to influence the direction of the e-textbook market. Results from the UW pilot reinforce and expand on other investigations in this area. A multi-institution study conducted by Internet2 found similar collaboration and accessibility challenges as those encountered at the UW. A recent report by Digital Book World, aimed at the publishing industry, concluded that students “just aren’t taking to e-textbooks” but are interested in “integrated learning systems” that bring together a variety of resources, another pattern that corresponds with UW data. The findings we have shared provide a roadmap for this evolving space, but advancing toward this future requires that others in higher education echo these and other needs and that industry leaders pioneer new ways to design and deliver the next e-textbook solution. Together, the higher education community can demand, create, and benefit from e-textbooks that exceed the potential and pleasure of the printed page.
Notes
8. Due to rounding, percentages in some of the figures do not add to 100.