Internet2 eTextbook Spring 2012 Pilot

Final Project Report

August 1, 2012

Participating Institutions:

Cornell University

Indiana University

University of Minnesota

University of Virginia

University of Wisconsin

Executive Summary

Background: In October 2011, the Provosts at the Committee on Institutional Cooperation (CIC) institutions expressed interest in initiating a quick-turn-around multi-institutional eTextbook pilot. The next month, Indiana University approached the Internet2 organization to put together an eText pilot for the spring 2012 semester, based on IU's eTexts Initiative. In January 2012 IU, along with Internet2, McGraw-Hill, and Courseload launched the Spring 2012 eTexts Pilot. The University of Wisconsin, University of Minnesota, Cornell University, and the University of Virginia joined the pilot and evaluation. University of California, Berkeley had a limited implementation and elected not to participate in the evaluation study.

Project Organization: Each of the participating institutions generally followed a similar path in implementation and agreed to be part of a coordinated multi-institutional project evaluation. Institutions did vary in terms of how they constructed implementation teams, the role of the bookstore, faculty selection process, courses selected, communication strategy, and technology platform.

Why eTextbooks? The increasing cost of textbooks and the greater availability of laptop computers, eReaders and tablets created a unique opportunity through a coordinated pilot project to evaluate the costs and benefits of providing electronic textbooks to students.

How Did Students Access the eTexts? The project leveraged the "Courseload" eReader application which was integrated with course management systems at individual institutions. For the pilot project, one publisher (McGraw-Hill) provided the electronic texts. These materials could be used on a variety of computers or printed out at a nominal cost.

Selection of Faculty: At most institutions faculty were chosen based on interest, current use of McGraw-Hill texts, diversity of disciplines, types of courses, enrollment sizes, and willingness to participate in a pilot research study.

Research Study: As part of the project, the participating institutions agreed to collaborate on an evaluation of the eTextbook pilot. All institutions used a student survey and faculty interview protocol with a common set of questions (additional questions could be added by each institution) and usage data from Courseload. Some institutions also conducted student focus groups. As part of the overall evaluation effort, a separate accessibility study was carried out on the Courseload platform by the University of Minnesota Office of Disability Services.

Research Results: Major findings included:

- Only a minority of users elected to purchase a paper copy (12%).
- The lower cost of an eTextbook was considered the most important factor for students considering future purchase of an eText.
- The portability of eTexts also ranked very high as a factor leading to future purchase.
- Other important factors in future eText purchases included that it should be accessible without an internet connection and available throughout a student's academic career, not just for a semester.
- Difficult readability of the text (e.g., difficult zoom feature) was mentioned numerous times by students as well as lack of native functionality on tablets such as the iPad.
- Faculty, for the most part, did not report using the enhanced eText features (sharing notes, tracking students, question/answer, additional links, etc.) and indicated the need for additional training.
- Because faculty did not use the enhanced features students saw little benefit from the eText platform's capability of promoting collaboration with other students or with the professor.

Recommendations for Next Steps: Each institution in the pilot will likely follow a slightly different approach. Some will be participating in a follow-up, broader Internet2 implementation in fall 2012. There are some general considerations, however, that most of the participating institutions are likely to follow:

- Decide at each institution how to proceed in developing a plan for the optimal procurement, distribution, funding, and management of eTextbooks. Key issues include the role of open educational resources, volume pricing with commercial publishers, additional pilot projects, and whether to adopt a common eTextbook platform.
- Focus on the impact of eTextbooks on students as one of the most important considerations.
- Use the data from the eTextbook pilot to establish baseline criteria for metrics for decision making.
- Ensure that eTextbooks are available on a variety of platforms (i.e., tablets, laptops, mobile devices and not limited to sole source hardware, software, LMS or other proprietary components) to best meet the needs of students and faculty.
- Ensure that the eReader platforms used by higher education institutions provide full accessibility accommodations to students with disabilities (just getting a hard copy of a text is not a solution to accessibility issues).
- Engage faculty to take advantage fully of the capabilities of digital course materials.
- Solicit faculty and student opinions to determine critical features necessary for eText adoption.
- Use inter-institutional organizations (CIC, AAU) to advocate that publishers improve accessibility and usability and provide standard formats for electronic materials.
- Determine a method of evaluating eTextbooks independent of the eReader platform (e.g., evaluate multiple eText platforms).

Acknowledgements

We wish to acknowledge the exceptional inter-institutional collaborative approach of the evaluation team that produced this report. We believe this effort can serve as a model for future research in this area. Indiana University's Stacy Morrone convened the inter-institutional research group. The Cornell University team led by Clare van den Blink produced the data templates and aggregated data reports. University of Minnesota's team led by Sandra Ecklein, Sue Engelmann, and Bob Rubinyi compiled this report. Special thanks to James Pflasterer at Internet2, Brad Wheeler and Nik Osborne at Indiana University, Michael Burton and Alix Grimm at Courseload, and the McGraw-Hill Educational Publishing teams for making the project possible. The institutional research participants included:

Cornell University

- Barbara Friedman, Assistant Director, Academic Technologies
- Jill Henery, IT Project Manager
- Eric Howd, Instructional Technology Specialist
- Kim Nicholson, Instructional Technology Specialist
- Clare van den Blink, Director, Academic Technologies

Indiana University

- Alan Dennis, Professor and John T. Chambers Chair of Internet Systems, Kelley School of Business, Indiana University. Co-founder of Courseload, Inc.
- Anastasia (Stacy) Morrone, Associate Vice President, Learning Technologies and Dean, IT, IUPUI, Office of the Vice President for IT and CIO

University of Minnesota

- Brad Cohen, Associate CIO, Office of Information Technology
- Bob Crabb, Director, University Bookstores
- Sandra Ecklein, Director of Academic Systems Integration, Office of the Senior Vice President for Academic Affairs and Provost
- Susan Engelmann, Associate to the Vice Provost, Office of the Senior Vice President for Academic Affairs and Provost
- Ole Gram, Associate to the Vice Provost, Faculty and Academic Affairs
- Ron Huesman, Director, Institutional Assessment, Office of Institutional Research
- Peggy Mann Rinehart, Associate Director, Disability Services
- Bob Rubinyi, Director of Distributed Education, Office of the Senior Vice President for Academic Affairs and Provost
- Karen Williams, Associate University Librarian for Academic Programs, University of Minnesota Libraries

University of Wisconsin-Madison

- Les Howles, Senior Instructional Design Consultant
- Brian McNurlen, Assistant Director, Technology Solutions for Teaching and Research
- Joshua Morrill, Senior Information Processing Consultant

University of Virginia

- Michael McPherson, Associate Vice President and Deputy Chief Information Officer

Rationale/Purpose for eTextbook Pilot

In the last few years, several major trends have led to an increased interest among higher education institutions in the use of eTextbooks. First, higher costs for print textbooks have made eTextbooks an attractive alternative in helping to reduce the overall cost of college attendance. Second, the increasing prevalence of computers, broadband, and eLearning has made electronic textbooks a more practical tool for students. Finally, consumer acceptance of eBook platforms (Nooks, Kindles, and iPads) and accompanying content sales on Amazon and other outlets have prepared the ground for greater adoption of eTextbooks. Unlike the general book market, however, where Amazon now sells more eBooks than print books, building student acceptance of eTextbooks has faced major challenges.

Internet2 eTextbook Pilot – Invitation, Logistics and Processes

In October 2011, the Provosts of the Committee on Institutional Cooperation (CIC) expressed interest in initiating a quick-turn-around multi-institutional eTextbook pilot with the goal of evaluating faculty and student reaction to eTextbooks, identifying the benefits/challenges, and potentially encouraging adoption of eText models at these institutions. The next month, Indiana University approached the Internet2 organization to discuss carrying out an eText pilot for the spring 2012 semester. The focus was on creating a simple way for institutions to pilot eTexts on their own campuses without individually having to negotiate with publishers and platform providers.

The pilot was based on IU's eTexts initiative begun in 2009. Over the last three years, the IU eTexts Initiative has focused on changing the way students purchase and interact with textbooks and other learning materials by utilizing the strength, size, and leverage of the university on behalf of its students, The IU initiative is focused on implementing a model that delivers digital educational resources and supplements ("eTexts" - this includes textbooks, simulations, software, and other digital learning materials) to students at greatly reduced costs and in formats that enhance teaching and learning. The IU eTexts Initiative has been piloted at IU since 2009, and went live in September 2011 (see appendix for a complete description).

IU and Internet2 negotiated a contract with McGraw-Hill and Courseload to provide McGraw-Hill content and the Courseload platform to a number of institutions for a flat fee. Interested schools did not need to sign or negotiate a separate contract with McGraw or Courseload, instead they executed a lightweight Memorandum of Understanding with Internet2. Internet2's contract with McGraw and Courseload governed the pilot, use of content, etc.

In exchange for a flat fee ($20,000), institutions were able to use eTexts in up to 10 sections or with 1000 students (whichever maximum was met first). Institutions were also invited to engage in a research study that analyzed student and faculty use of the eTexts. Indiana University and Internet 2 then extended an open invitation to CIC member institutions and, more broadly, to other R1 institutions that had an interest in participation.

In January 2012 IU, along with Internet2, McGraw-Hill, and Courseload launched the Spring 2012 eTexts Pilot. The University of Wisconsin, University of Minnesota, Cornell University, and the University of Virginia joined the pilot. The University of California, Berkeley also participated in the pilot but, due to a limited number of students involved, opted not to engage in the joint evaluation. Indiana University elected to join the joint evaluation, although IU had a much broader implementation.

Internet2, a non-profit consortium consisting of higher education research institutions, government agencies, and corporations, played a critical role of fiscal agent, making the arrangements with the eReader provider, the publisher, and the participating institutions. Through the efforts of Internet2, the low-cost, multi-institutional pilot was initiated with simplified contracting. Indiana University, Courseload, and McGraw-Hill were also critical partners, mobilizing very quickly and providing extensive support to the pilot institutions.

Participating Pilot Institutions and Implementation Approaches

Each of the participating institutions generally followed a similar path in implementation and agreed to be part of a multi-institutional project evaluation. While similar in approach, they did vary somewhat in how they constructed their implementation team, the role of their bookstore, faculty selection process, courses selected, communication strategy, and technology platform. The approach followed by each of the pilot institutions is listed below.

Cornell University

Electronic textbooks have been available to Cornell instructors through The Cornell Store (campus bookstore) for approximately two years, using the CafeScribe system. In addition, various campus groups have been considering and reviewing eBooks on campus, such as the Cornell University Library and Academic Technologies.

During the pilot, instructional staff and students at Cornell received their eTexts at no cost and could access materials on any HTML5-capable tablet, smartphone, or computer. The technology was piloted as part of a comprehensive approach to understanding and influencing the future of eTexts. The pilot also examined support, documentation and training practices for possible expanded use on and beyond the Cornell campus.

Staff from The Cornell Store provided baseline data on eBooks sold during the Fall and Spring of 2012. Prior to the start of the Spring semester, a web accessibility review was conducted with staff of the Office of Student Disabilities.

Team Structure

The Academic Technologies group in the Office of the Chief Information Officer initiated the eText pilot project at Cornell, provided the campus leadership for the effort, and support for participating faculty. The Director of Academic Technologies served as the project director for the pilot.

Cornell's project team consisted of representatives from:

- Cornell Store: Store project manager, faculty acquisitions and custom textbook staff.
- CU Library: ePubs task force co-chairs, and Associate University Librarian.
- Faculty: Participated in the pilot and provided data to the evaluation of the pilot.

Course Technologies staff within Academic Technologies implemented the Courseload building block with Blackboard 9.1.

Bookstore Role

The Cornell Store, which is an independent bookstore, was part of the eText committee. They assisted with faculty recruiting and pilot communications and provided eBooks usage data to the committee.

Faculty Selection Process

Faculty were recruited for the pilot through several communication and outreach channels. The participating publisher in the pilot (McGraw-Hill) provided a list of their books in use at Cornell. Individual faculty were then contacted based on this list. Associate academic deans also sent messages to department chairs in the eleven Cornell colleges.

Academic Technologies developed a short list of faculty known for teaching excellence, and/or interest in emerging technologies and/or electronic textbooks. Four faculty members agreed to participate in the pilot and selected McGraw-Hill electronic textbooks for use in their courses.

Once faculty were identified, the project team met with faculty and then determined if they were appropriate for the pilot, based on eligible books for courses.

Cornell University Spring 2012 Pilot Courses

PHYS 1102: General Physics II	Self-paced auto-tutorial course for non-majors.	1	Giambattista	383 undergraduates	Giambattista, A., Richardson, B., Richardson, R. *College Physics With an Integrated Approach to Forces and Kinematic, .3rd ed.* McGraw-Hill, New York, 2010. ISBN# 978-0077263225
ANTHR/ARKEO-1200 Ancient Peoples and Places	Large Introductory course for majors and non-majors	3	Henderson	247 undergraduates	Feder, K. *Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology,7th ed.,* McGraw-Hill, New York, 2012 ISBN# 978-0078116971
ILRHR 6590: Balancing Ethics, Economics and Social Responsibility	Small course for graduate students (Masters in ILR) and seniors by permission of instructor	4	Wright	16 graduate students/seniors with permission to enroll	Hartman, L. *Business Ethics: Decision-Making for Personal Integrity & Social Responsibility, 2nd ed.,* McGraw-Hill, New York, 2010. ISBN# 978-0078137136
HD 4980 Senior Honors Seminar	Small seminar for Senior Honors students	1+	Casassola	4 seniors in Honors program	Rosenthal, R. *Essentials of Behavioral Research: Methods and Data Analysis*, 3rd, ed., McGraw-Hill, New York, 2007 ISBN# 978-0073531960

Communication Strategy

Cornell used the following methods to communicate information on the project:

- A pilot web site was created.
- Information about the pilot was distributed in the Academic Technologies and IT newsletters.
- Presentations about the pilot (including an invitation for faculty to participate) were made at faculty meetings.
- At the end of the spring semester, an eText forum was held for the campus community. Several pilot project faculty members participated in a panel discussion about the findings. A video was recorded of this session.

Technology Platform Approach

Course Technologies staff within Academic Technologies implemented the Courseload building block with Blackboard 9.1.

Specific Evaluation Approach

Student Focus Group

In April, 2012, Academic Technologies staff conducted two 60 minute focus groups employing protocols developed by the pilot team. All participants (n=17) were Cornell undergraduates enrolled in pilot courses that utilized Courseload through the semester. Participation was voluntary and the group was audio recorded for note taking purposes. An incentive of $25 was offered to each student who participated. Respondents were informed that information from the focus group would be reported in aggregate with no identifying information used.

Faculty Interviews

In May, 2012, Academic Technologies staff gathered data from pilot faculty members (n=4) employing protocols developed by the project team. Participation was voluntary and faculty were provided the option of individual interviews or responding to questions via e-mail Those who were interviewed were audio recorded for note taking purposes.

Online Student Survey

In April, 2012, all pilot students were provided an opportunity to complete a 12-item online survey. The protocols for the survey, as well the first nine items, were developed in collaboration with consortium institutions during the winter of 2012. The remaining three items were local questions developed by the Cornell team. Respondents who provided their campus e-mail address were entered to win one of six $25 gift certificates. Students were informed that if they choose not to participate or should they withdraw from the survey at any time, there would be no penalty. Responses were anonymous and were not used in any way that could impact a student's status at the institution. Participants were also informed that the results of the evaluation study may be published, but names or other identifying information would not be published.

Teaching Assistant Survey

In April, 2012, all pilot TA's were provided an opportunity to complete a 6-item online survey. All items were local questions developed by the Cornell team. Responses were anonymous and were not used in any way that could impact a student's status at the institution. Participants were also informed that the results of the evaluation study may be published, but names or other identifying information would not be published.

Non-Pilot Faculty Online Survey

In April, 2012, a group of faculty who used eTextbooks at Cornell but were not participants of the pilot were provided an opportunity to participate in a 9-item online survey. Respondents were informed that participation was voluntary. They were also informed that the results of the evaluation study may be published, but names or other identifying information would not be published.

Interview with eTextbook Author

One of the pilot faculty members was the author of an eTextbook used during the study. The eTextbook, College Physics With an Integrated Approach to Forces and Kinematic, 3rd ed. had been published by McGraw-Hill and made available through Courseload. The project team developed a question set that would examine the faculty member's experience publishing and incorporating the resource.

Indiana University

Team Structure

The eText research project was conducted at Indiana University during the Spring 2012 semester and led by Anastasia Morrone, Associate Professor of Educational Psychology and Associate Vice President for Learning Technologies. The co-Principal Investigator on the research project is Alan Dennis, Professor and John T. Chambers Chair of Internet Systems, Kelley School of Business.

Bookstore Role

The bookstore at Indiana University had no involvement with the eText project or evaluation. Students in courses that are using an eText through IU's eText agreement with textbook publishers are charged an eText fee, which is billed directly through the Bursar's Office.

Faculty Selection Process

Selected faculty who were invited to participate in the eText research during the spring semester were first identified through the teaching centers on the Indianapolis and Bloomington campuses as faculty members who have consulted with the teaching center on their use of an eText. The faculty members were contacted via email by the Principal Investigator and invited to participate in the study. All but one of the faculty members contacted agreed to participate.

Communication Strategy

Ongoing communication about eTexts at IU is done through a variety of communication channels at IU.

Technology Platform Approach

As indicated above, students access their eTextbooks through a single sign on process that is integrated through Oncourse, IU's Learning Management System (Sakai software).

University Of Minnesota

Team Structure

At the University of Minnesota, Vice Provosts Robert McMaster and Billie Wahlstrom were the executive sponsors. A project management team was assembled to address timelines, deliverables, challenges, risks, and metrics. The project depended upon a highly collaborative model which included several Provost's Office units, Disability Services, Office of Information Technology, University of Minnesota Bookstores, University Libraries, Institutional Research, Office of General Counsel, a representative from the Senate Committee on Educational Policy (SCEP), a faculty member, and a student from one of the classes in the pilot.

The team had only about eight weeks before the start of the spring semester to finalize the legal and financial aspects, select faculty participants, integrate the technology, and prepare students. They continued to meet periodically throughout the semester for updates on the pilot and came together to prepare the final report.

The Provost's Office provided the $20,000 flat fee to participate, which allowed the University to select up to 10 sections and 1,000 students for the pilot. eTextbooks were provided at no charge to students, with the option to pay $28 if they want a printed copy in addition to the electronic version. Students with documented print disabilities who could not use the eTextbook received the print copy at no cost.

Goals

The following goals were identified for the pilot at the U of M:

- To pilot the use of eTextbooks for a limited number of classes during spring semester 2012 using a multi-unit project team approach. This gave the University an opportunity to explore eTexts from a campus-wide perspective and learn how units would work together to streamline the process.
- To collaborate with other Internet2 members to explore the impact of eTexts in different higher education settings. The University was able to take advantage of the framework Indiana had already set up and to learn from peer institutions who were also participating in the pilot.
- To explore and understand how students with disabilities—including those who use screen readers—can access and navigate material through an eTextbook application (in this case, Courseload).

Bookstore Role

The active cooperation of the University of Minnesota Bookstores was an important component in the success of the project. Bookstore director Bob Crabb played a key role in identifying faculty for the pilot, assisting with print-on-demand services, managing logistics with the publisher, and participating in the U of M and inter-institutional evaluation groups.

Faculty Selection Process

In late November, an email was sent from Vice Provost Wahlstrom to all faculty on the Twin Cities campus, inviting them to participate in the pilot. The project team identified multiple criteria for the selection of faculty: current use of a McGraw-Hill text in their course, ability of McGraw-Hill to convert the book to electronic format, willingness of faculty to meet rapid timelines, interest in use of eTextbooks, willingness to collaborate on the research study, and willingness to use enhanced features of the eTextbook. In addition, the project team sought an overall diversity of disciplines, types of courses and enrollment size. Faculty were evaluated on a first come, first served basis. Based on the criteria, nine faculty representing eight courses and 713 students were selected for the pilot. All of the McGraw-Hill texts were selected and confirmed by December 12, 2011.

Based on the criteria, nine faculty representing eight courses and 680 students were selected for the pilot.

Faculty	Department	Course	Enrollment
Sehoya Cotner	Biology	BIOL 2012	110
David Fan	Genetics, Cell Biology & Development	BIOL 1101	58
Rhonda Franklin	Electrical & Computer Engineering	EE 5613RF	14
Donald Liu	Applied Economics	APEC 1101	91
Helen Moser	Finance	FINA 4122	125
Nathan Springer/ Peter Tiffin	Plant Biology	PBIO1212	66
Teresa Swartz	Sociology	SOC 3251W	62
Henriette Warren	Child Development	CPSY 4303	154

Communication Strategy

A public website (http://www.elearning.umn.edu/etext) was created to share information with the public and U of M students, faculty, staff, and administrators. A Moodle site was created to post relevant information for the internal project team and faculty. Project leads worked with University Relations to develop news stories for local press. The pilot received statewide and nationwide publicity with local feature articles in the Minnesota Daily (student newspaper) and Minnesota Public Radio News. The eText pilot team also presented a poster, "eTextbooks: A Collaborative Approach to a Pilot," at the U of M Academic Technology Showcase and presented a brief session at the May 2012 meeting of the American Distance Education Consortium at the University of Maryland.

Faculty were asked to send an email to their students shortly before the semester began informing them of the pilot and letting them know that they would be receiving the eTextbook free of charge. Directions for accessing the eTextbook, including information about compatible browsers, were provided along with a link to a help page with detailed instructions for using the Courseload features

Technology Platform Approach

Ensuring that students and faculty had easy access to the electronic texts was critical for the pilot. By integrating the Courseload application with the Moodle course management system, the University of Minnesota enabled students to use their U of M login and password to access the texts. The U of M Information Technology group (OIT) completed testing of the Moodle/Courseload integration and moved it to production on January 8. Courseload offered a series of faculty training webinars during December 2011 and January 2012 for all nine participating U of M faculty. Access to the eText via the Moodle course site was available from the beginning of the semester through mid-August 2012.

Students in the pilot were instructed to contact the University's 1-HELP student support service if they had technical difficulties. Faculty were encouraged to contact selected members of the project team if they needed further help. In addition, members of the project team were available for in-class demos or for one-on-one consultation with students via phone or email. Most technical difficulties were related to pop-up issues with browsers; after the first couple of weeks calls for help dropped off dramatically.

Specific Evaluation Approach

Representatives from the U of M Libraries and the Office of Institutional Research completed the IRB process. An evaluation subcommittee was formed which identified seven key research questions:

1. What are key factors that influence institutional, faculty, and student adoption of eTextbooks?
2. How does the use of eTextbooks shape student interaction with content, classmates, instructors?
3. How does using eTextbooks impact the student learning experience?
4. How do students perceive eTextbooks?
5. How do faculty perceive eTextbooks?
6. Are there compelling correlations between student use of eTextbooks and student demographics, course outcomes?
7. What are students' perceptions of their reading, engagement, and learning from the eTextbook compared to a paper textbook?

The subcommittee decided to use the common set of student survey questions and faculty discussion questions without any additions. Paper surveys were distributed in participating classes toward the end of the semester and faculty were interviewed in informal discussions in groups of 2-3. Minnesota also elected to conduct two student focus groups facilitated by the Office of Measurement Services to further assess students' perceptions in the areas of: (1) student interaction with eTexts, course content, peers and faculty; (2) faculty interaction with eTexts and students; and (3) future purchase and use. The focus groups consisted of 13 students from six of the eight courses. Courseload usage data was also analyzed. Finally, a separate, in-depth accessibility study was conducted by the Office of Disability Services (see section below).

University of Virginia

Electronic textbooks have long been offered as an alternative to print textbooks (when available) by the University's Bookstore. The choice of electronic textbooks has been left up to individual students. The University Library also has a long history of making digital versions of teaching resources, including electronic textbooks, available to students and faculty.

For this Pilot, all core project costs were subsidized by the Office of the VP/CIO. There was no cost to either the students or the faculty of participating courses unless they chose to print or order a print-on-demand book.

Team Structure

The project team at Virginia included:

- Office of the VP/CIO: project sponsorship; coordination with Internet2, McGraw-Hill, and Courseload; and participation in the research team
- Information Technology Services: integration of Courseload into UVaCollab (Sakai instance); support for instructors; and technical liaison with McGraw-Hill and Courseload

Bookstore Role

The UVa Bookstore was not involved in the Spring 2012 Pilot.

Faculty Selection Process

Faculty were recruited through a presentation to the University Committee on Information Technology (UCIT), the presidentially-appointed primary advisory committee to the VP/CIO. Interested faculty were engaged in a conversation with the Office of the VP/CIO and self-selected into the Pilot.

Communication Strategy

- Presentations were made during the course of the semester to various faculty and IT advisory bodies, including UCIT, the Faculty Senate Executive Committee, and the Deans Technology Council
- Interviews were given to a number of local and national publications

Technology Platform Approach

ITS staff integrated the Courseload Sakai tool into UVaCollab.

Specific Evaluation Approach

Students and faculty were debriefed at the end of the semester. The Office of the VP/CIO administered the standardized student survey in person to those classes for which scheduling was possible, and offered a Web-based version of the student survey to all those participants who were not surveyed in person. Responses to both in person and Web-based surveys were anonymous. Individual interviews were conducted with participating faculty, with no identifying information associated with individual comments.

University of Wisconsin-Madison

Team Structure

The UW Madison eText pilot project consisted of a **Sponsor Team** which included five high-level university leaders and an **Implementation Team** consisting of approximately 14 individuals from various campus units. A project manager worked with the two teams and coordinated all pilot activities.

The project **Sponsor Team** met on a bi-monthly basis with the project manager to review project status and provide direction. The project sponsors included the five following campus leaders:

1. CIO and Vice Provost for Information Technology
2. Associate Vice Chancellor, Enrollment Management (Registrar)
3. Director of Libraries
4. Vice Provost for Teaching and Learning
5. Director of Academic Technology

Individuals comprising the **Implementation Team** met on a weekly basis throughout the semester. These individuals were from the following campus units:

- Enrollment Management (Registrar's Office)
- Campus Libraries
- Division of Information Technology (HelpDesk, LMS support, Infrastructure, Academic Technology)
- The McBurney Accessibility Center
- Student Governance

Members of the **Implementation Team** were grouped into nine sub-teams with a team leader who reported to the project manager and presented updates to the full team on a bi-weekly basis. These sub-teams included the following:

1. Faculty Selection team
2. LMS Faculty Support team
3. LMS Technical Support team
4. Infrastructure team
5. HelpDesk team
6. Accessibility team
7. Communications team
8. Evaluation team
9. Looking Forward team

Bookstore Role

The University of Wisconsin Bookstore is an independent business entity which is not affiliated with the University. Because the majority of faculty and students transact book orders and course material purchases through the Bookstore, it was essential that the eText pilot project involve the Bookstore, especially during the early phases of the pilot. The Bookstore management was extremely cooperative and supportive to project team members, faculty and students. The Bookstore manager was instrumental in accomplishing the following:

- Communicating regularly with the Registrar's Office and Faculty Selection Team on how to make the eText acquisition process easy for faculty and student participants.
- Working with faculty and assisting in making sure students were aware of the free eTexts.
- Working with the McGraw-Hill sales representatives to ensure reduced supplies of hardcover books for the pilot courses and also maintaining a back storeroom supply of hardcover texts for students who choose to opt out of the pilot.
- Placing signage on book shelves for participating pilot classes notifying students of the free eText.
- Honoring and reinforcing a refund policy for students who had already purchased a textbook.

Faculty Selection Process

The Faculty Selection sub-team was assembled to select candidate faculty/courses for the pilot within a two week time frame. Faculty/courses were selected based on the following criteria:

- Large classes over 75 students
- Course uses a McGraw-Hill textbook
- Faculty member is actively using the D2L CMS
- Course is either an online or hybrid course
- Course uses a relatively expensive textbook
- Course is mainly for undergrads (might include an upper level undergrad course with graduate students)
- Diversity of faculty and disciplines
- Not a cross listed course

The process of selecting faculty/courses for the pilot proceeded as follows:

1. Five consultants from the Department of Academic Technology formed the Selection Team.
2. A filtered list was generated of all courses that used both the D2L CMS and a McGraw-Hill textbook.
3. From the filtered list, 10-12 courses were identified using the selection criteria above.
4. The list of target courses/books was sent to McGraw-Hill to confirm eText availability. (Note: approximately 1/3 of books from initial list were not available in eText format.)
5. An email invitation was sent out to all candidate faculty from the Provost of Teaching and Learning explaining the pilot, inviting them to consider participating and to expect a follow-up telephone call from an eText consultant within a few days.
6. eText consultants contacted each candidate faculty member via phone to discuss the pilot and to determine interest and eligibility.
7. Six courses were selected as finalists and arrangements made for notifying faculty, students and the Bookstore as well as setting-up links to eTexts from within the CMS. (Note: One of the selected courses ended up being dropped because of a mistake with McGraw-Hill not being able to provide an eText version of the book.)

UW Madison Faculty and Pilot Courses

	Faculty	Course	Students
1	Felix Elwert	Sociology 120: Marriage and Family	293
2	Shawnika Hull	Journalism 565: Effects-Mass Communication	75
3	Suzannah Sandrik	Engineering, Mechanics & Astronautics 202: Dynamics	88
4	Michael Titelbaum	Philosophy 211: Elementary Logic	83
5	Kevin McSweeney	Environmental Science 101 (Soil Science)	183
6	Steve Ventura		

Estimated total students: 722

Communication Strategy

The following mechanisms were created and utilized throughout the pilot to facilitate communication and information sharing amongst team members, the university community and the general public.

1. **EText List Serv:** The entire pilot team joined a list serv which was used to communicate developments, issues, resources, news and meeting results and times.
2. **EText Project Wiki:** All project team members accessed and used a project wiki to store project documents and get in-depth updates and information on all aspects of the project. Each sub-team had their own section of the wiki.
3. **EText Pilot Email Account:** A separate email account was set-up for team members to communicate with faculty participants, university community members and the public. Project team members could use this email account, rather than their own personal accounts, for all external communications during the pilot.
4. **EText Project Web Site:** A project web site was used to keep the university community and the public informed about the pilot. This site was developed and maintained by the Communications unit within the Department of Information Technology CIO's office.
5. **Weekly Sponsor Updates:** At the end of every week the eText Sponsors received an email from the project manager updating them on project developments, problems and issues of interest.

Technology Platform Approach

A link to the Courseload eReader application was integrated into the homepage of each participating pilot course within the Desire2Learn Course Management System. Students and faculty from each pilot course would see a link at the top banner of their D2L user interface which would open the Courseload eText reader. Individual student authentication into Courseload was automatically achieved through D2L passing encrypted student data via B-LTI to Courseload through an HTTPS connection.

Specific Evaluation Approach

The University of Wisconsin-Madison conducted in-person paper surveys for each of the classes involved in the pilot. The pilot faculty favored this approach which seemed to solicit greater participation from students. In addition to the common questions, the University of Wisconsin-Madison added questions at the end of the survey to better assess the perception of price and to more directly solicit comparisons of eTextbooks from students to their paper textbook counterpart. Individual interviews with each faculty participant were also conducted using the "Faculty Discussion Questions" provided by the multi-institutional evaluation team.

Environmental Scan

eTextbook Market Landscape

On the basis of discussions with eTextbook publishers, the University of Minnesota Bookstore Director, and a review of recent articles in educational publications, the following points emerged:

- *eTextbook sales lag significantly behind general eBook sales*. Amazon.com, for example, sells over 50% of their books as eBooks (New York Times, May 19, 2011). Conversely, the University of Minnesota Twin Cities bookstore, one of the national leaders in eTextbook sales, sees only 1% of their texts sold in eText format.
- *Prices for eTextbooks from most publishers are still relatively high through the standard business-to-consumer sales model* compared to the cost of used print textbooks or rentals, leading to a disincentive for students to purchase eTextbooks. See appendix for further developments by IU in this area.
- *eTextbook business models, software readers, and licensing models are fairly immature*. It is likely that publishers will significantly alter their methods of offering eTextbooks in the next few years.
- *Availability of eTextbooks is typically on a 180 day "rental" basis*. This short period may work for some books in some classes but for classes in a student's major, the eTextbooks need to be available for the student's entire academic career.
- *Accessibility of eTextbooks for users with disabilities is lacking*. Most eTextbook reading platforms appear to have significant challenges in terms of accessibility.

eTextbook Projects at Participating Institutions

<u>Indiana University</u>

The IU eTexts Initiative has been piloted at IU since 2009, and went live in September 2011. IU entered into agreements with publishers and an eReader software provider on behalf of the students. This allowed IU to provide eTexts to their students at a much lower cost (approximately 50% of the cost of an eText offered in the marketplace) and without the restrictions that are common in the marketplace (limited ability to print, limited access to the text, limited number of devices on which to view the text). In exchange, IU developed the IU eText Fee Model that guarantees publishers 100% sell through by charging a fee for the content to every student in an eText section. A full description of the Indiana University initiative can be found in the appendix.

University of Minnesota

In addition to the Spring 2012 Courseload/McGraw-Hill Pilot, several additional eTextbook efforts are currently underway at the University of Minnesota:

1. *Open Source Initiative* - In an effort to reduce costs for students, the College of Education and Human Development, under the leadership of Dean Jean Quam and David Ernst, director of academic technology services, has created a catalog of open textbooks to be reviewed by faculty members. Open textbooks are complete textbooks released under a Creative Commons, or similar, license. Instructors can customize open textbooks to fit their course needs by remixing, editing, and adding their own content. Students can access free digital versions or purchase low-cost print copies of open textbooks.
2. *University of Minnesota Crookston eTextbook/Tablet Initiative* - Bruce Brorson, Associate Professor, University of Minnesota Crookston, is leading a tablet assessment project examining the Apple iPad and Android platforms. A key element of the project involves acquiring a greater understanding of the use of eBooks in support of instruction, including the use of eBooks as textbooks and the checkout and use of eBooks from Library services.
3. *University of Minnesota Twin Cities Bookstore* - The University of Minnesota Bookstore leads the country in sales of eTextbooks. In May 2012, University Bookstore Director Bob Crabb was cited in national media with the announcement of a groundbreaking agreement with McGraw-Hill aimed at accelerating the adoption of eBooks on campus.
4. *University Libraries* - The University Libraries provides access to more than 415,000 books in electronic format, including some eTextbooks, which are available for use by current students, faculty, and staff. They vary in features (downloading, linking) and are sometimes grouped together by subject or publisher. Library eBooks can be read on iPads, other mobile devices, and laptop/desktop computers. Many library eBooks are one reader at a time.

Articles and Research - Literature Review

Written by Kim Nicholson, Academic Technologies, Cornell University

Use of electronic textbooks in higher education is expanding in scope and sophistication. Recent studies suggest changes in student and faculty experience with the technology. Woody et al. (2010) studied preference for electronic versus conventional books with students at a medium-sized regional university. While participants were reported to be the most technologically sophisticated cohort to enter the university, no preference for electronic textbooks could be indicated. Students did not prefer eTexts regardless of gender and/or reported comfort level with computers. No significant correlation could be found between number of eTexts previously used and overall preference for eTexts.

Participants who had previously used an eText reported preferring print texts for learning. Despite the availability of supplemental content via hyperlinks and other features, students were still more likely to use features in conventional texts than in electronic ones.

Less than a year later, Dennis (2011) published a summary of two years research on electronic textbook use at Indiana University. Instructors and students accessed eTexts through the institution's Learning Management System. The study focused on student behavior, factors influencing preferences and impact on learning. Among the findings, were that students were more likely to prefer eTexts when instructors *actively made use of the technology.* Learners using eTexts for a second time preferred eTexts more than those using them for the first time.

While reduction in cost was expected to be the most significant reason for preference, cost was no more important than instructor's annotations and sustainability. Learning, as measured by course grade, was not affected by number of pages read, but rather by number of annotations. Students who annotated more reported learning more. At the same time however, annotations made available by students *for* students were not identified as "useful to learning". Sun et al (2012) examined student perceptions about eText "helpfulness" as well as student involvement and learning outcome.

Results from studies suggest that electronic textbooks are perceived by students as enhancers of learning in two complementing routes: (1) eText helpfulness enhances student learning outcomes and (2) Student involvement plays a mediating role between eText helpfulness and learning outcome *if students use e-textbooks in class.* The findings suggest that along with the need for instructors to actively use the technology, successful adoption requires universities to provide necessary resources such as computer labs.

References

Dennis, A., (2011). *e-Textbooks at Indiana University: A Summary of Two Years of Research.* Kelley School of Business, Indiana University, Bloomington, Indiana.

Dennis, A, Duffy T., Morrone, A., (2010). *Indiana University e-Textbook Project: Spring, 2010 Findings.* Indiana University, Bloomington, Indiana.

Morrone, A., Dennis, A., (2010). *e-Textbook Use and Relationships with Course Performance, Motivation and Attitudes.* Center for Urban and Multicultural Education, Indiana University, Bloomington, Indiana.

Sun, J, Flores, J. and Tanguma, J. (2012). "e-Textbooks and Students' Learning Experiences". *Decision Sciences Journal of Innovative Education.* Vol. 10, (1), 63-77.

Woody, W., Daniel, D. and Baker, C. (2010) "Ebooks or Textbooks". *Computers & Education.* Vol 55, (3), 945-948.

Accessibility Findings

As part of the overall evaluation effort, a separate accessibility study was carried out on the Courseload platform by the University of Minnesota Office of Disability Services. The complete study is provided in the appendix.

Accessibility Study Methodology

During spring 2012, University of Minnesota Disability Services conducted a series of explorations and focus groups to determine how the eTextbook and supplemental course materials delivered through the Courseload platform were accessed and used by students with disabilities, what barriers are inherent in the Courseload applications, what accommodations are necessitated by the use of Courseload, and what issues and risks might result from Courseload implementation. This was not intended as an extensive review of the Courseload application but rather, a preliminary look at some of the issues students with print disabilities or vision impairment may encounter when attempting to access course materials delivered through the application.

Seven participants (four students and three staff) were recruited to evaluate the Courseload application. Only one of the students was enrolled in one of the spring semester pilot courses. Participants were asked to use their own computers and adaptive technologies in order to preserve customized configurations and settings. All were given access to the Moodle site and eTextbook for APEC 1101 Principles of Microeconomics, one of the pilot courses.

Key Findings

Both the skilled professionals and the students encountered similar accessibility issues in their attempts to access the eTextbook and other course materials as delivered through Courseload. Although the types and severity of disabilities vary greatly, even a user with a single mild impairment that requires a technology accommodation would find it difficult, if not impossible, to make use of the current Courseload application.

The Disability Services evaluators were unable to evaluate a native copy of the textbook as provided by the publisher. However, they were able to make some assumptions regarding access to the textbook when delivered using Courseload. Given that uploading an accessible (tagged) PDF document resulted in a graphically rendered document that was inaccessible, they inferred that all eText publications will be displayed in the same inaccessible manner in the Courseload application.

Students with print disabilities who are enrolled in eText courses using Courseload register with Disability Services. They receive a print copy of the book, which is then converted using optical character recognition and imported into an accessible scan and read program, like Kurzweil, or rich text or other formats.

The Disability Services evaluators understand that Courseload has a desire to make their product and delivery of eTexts accessible. Courseload should certainly be applauded and encouraged for their efforts. However, the Disability Services team cannot support the adoption of any application or system that does not provide an equivalent learning environment for students with disabilities.

Ongoing efforts are needed on three fronts. First, faculty and course developers must be made aware of accessibility and learning style considerations. They must also be given the resources and encouragement for understanding and implementing a universal design for learning approach. Second, universities, colleges, government entities, and other organizations need to collaborate in putting pressure on publishers to produce accessible eTexts. Thirdly, the tools used to deliver eText content must be accessible and not interfere with natively accessible materials.

Evaluation/Research Key Findings

Inter-Institutional Evaluation Methods

The evaluation effort was a critical part of the of the spring 2012 eText pilot project. Representatives from each school had regular phone conversations, facilitated by Indiana University, to plan the evaluation process. To enable consistent reporting, the four pilot institutions and Indiana University developed a common set of evaluation questions for both students and faculty to be used by all institutions in the pilot. Each institution was free to add questions and utilize additional research methods (e.g., student focus groups). Cornell University took the lead in compiling and analyzing results for the group, and the University of Minnesota agreed to prepare the first draft of a joint report aggregating the experiences of the participating institutions.

Key Findings

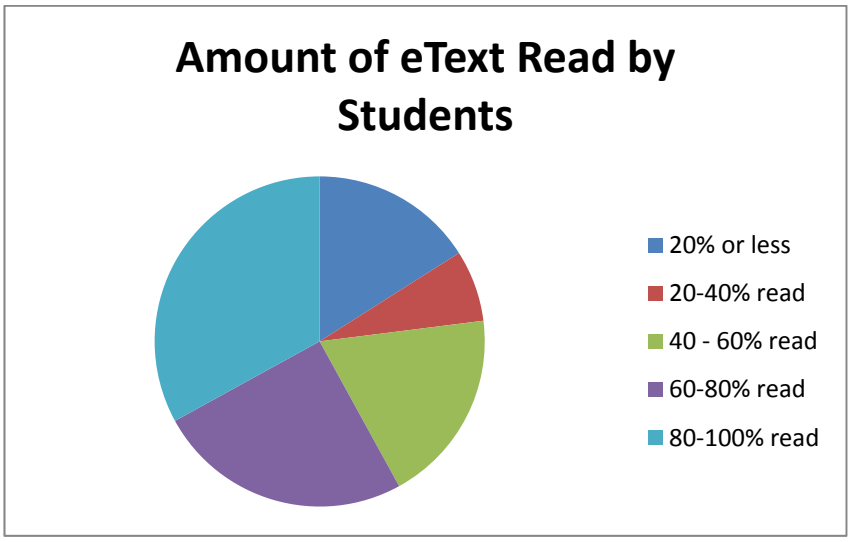
<u>How eTextbook Met Student Learning Needs</u>

The first series of survey questions asked students how well the eTextbooks met their learning needs compared to paper textbooks (rated on a 1-5 scale from “not at all” to “a great deal”). The highest rated items in this area were that eTexts offered students “greater flexibility to learn the way I want” (3.22 mean) and “using eTexts has

become part of my learning routine" (3.10 mean). Both means were in the "somewhat" meeting your needs category. In terms of the lowest rated items, students clearly did not believe the eTexts "helped me interact and collaborate more with classmates" (1.90) or "allowed me to interact more with my professor" (1.73). This could have been influenced by relatively low faculty use and modeling of collaboration features.

Amount of eTextbook Read by Students

Students reported reading about half of the assigned eTextbook readings. The overall average was 47.6%. What is not immediately apparent from the results is how this would compare with a conventional print reading assignment. Some participating faculty at the University of Minnesota did report lower student rates of reading than when they offered a print textbook in previous terms.



20% or less	16%
20-40%	7%
40-60%	19%
60-80%	25%
80-100%	33%

The use of the eTextbook did not lead to an increase in reading. "I read more of the assigned material than I would have if it were a paper textbook" had a relatively low mean of 2.33. eTextbooks portability appeared to provide more opportunities for students to "study just a little bit" as students used eTexts more frequently, in more places, or immediately before an exam.

User Experience

The findings suggest that the navigation and features of Courseload were somewhat easy to use (mean of 3.53), even though there was also agreement that using the eText the first few times was difficult (3.09). These finding could be reflective of a typical adoption curve for a new technology. One lesson is that when introducing a new technology, such as eTexts, it is important for faculty to receive support on how to use fully the software features.

eText & Software Features (Annotations & Interactions)

There was considerably less interaction reported in the survey, both among students and between students and their instructor. Students did not agree that "The instructor encouraged the use of the annotation, highlighting, and note sharing features of the eText throughout the course" (2.51 mean on 1-5 scale). One explanation for this is that faculty did not model the use of annotating, highlighting, and notes as a way to promote discourse about the text content.

In general, students did not find the annotations/highlights of other students to be helpful. A possible explanation is that students tend to value the instructor's comments to a much greater extent than other students' comments given that the instructor will be grading students on their performance in the course.

For students that rated the instructor's encouragement higher, they were also more likely to agree about the value of the annotation features. This group of students also found the annotations less distracting.

- "I highlighted and/or annotated more than I normally do with paper textbooks" (2.60 mean for those who had an instructor that was more highly engaged vs. 2.41 for the entire group)
- "I learned more from using the eText with highlighting and/or annotations (mine and others)" (2.62 for students with highly engaged faculty vs. 2.34 for the entire group)
- "The annotation/collaborative features in the eText were distracting" (2.57 for students with highly engaged faculty vs. 2.84 for the entire groups)

This differential based on faculty use was supported also by a number of the open ended comments: "If we are to use eTexts, our instructors need to make them a central focus of the course…"

Usability & Accessibility

Barriers to use that were reported through open ended student comments included readability, eyestrain, zooming difficulties, lack of readability on some mobile devices, and a dislike of reading on a computer or other device. Very few students reported web accessibility problems (8%). Student comments also indicated that they received insufficient instructions and orientation in how to use the technology.

Future Student Purchasing Decisions

The vast majority of students did not purchase a paper copy of the text (88%). Cost, portability, and having the eText accessible offline were rated as the most important variables when considering the purchase of a course eText. The highest ranked factors students reported in making a future purchasing decision in favor of an eTextbook were:

- *Costs less* than a used or rented traditional textbook (4.10)
- Is more *portable* than traditional textbooks (3.82)
- Is accessible without an Internet connection (3.47)
- Is available for my entire academic career, not only for one semester (3.39)
- Is more environmentally friendly than traditional textbooks (3.13)

These findings were supported in student open ended responses. In terms of cost, one student indicated, "*I would use eTextbooks more if they were much less expensive than paper textbooks. For now, I would choose paper textbooks because I can sell them back when I am finished with them. Textbooks are very expensive, which plays a big role in my thought processes when purchasing classroom materials."*

Portability was also an important factor: *"Most important factor for me was that I did not have to carry the textbook around. I am a student athlete and carrying textbooks on trips is very difficult."* From another student, *"I really love the ebook because instead of carrying around heavy textbooks all I need is my laptop, also it allows me to highlight and make notes without ruining the book like it would be for a textbook."*

The difficulty reading online, especially the zoom feature, was mentioned by a number of students: "*I do not like reading textbooks online. I found it frustrating trying to read off my computer, difficult to zoom and navigate easily. I prefer text that I can hold and highlight."*

Several students mentioned instructor (but not student) highlighting as an important factor: "*I did however benefit from my professor highlights in the etext."* From another student: *"The best part about the eTexts was the highlighting that we could see from the instructor."*

Findings from Student Open Ended Questions

Cornell

1. This was the first experience with an eText for 63% of student participants. Feedback reflected the novelty of using an eTextbook as a new technology.
2. Students were more likely to prefer eTexts when instructors actively made use of the technology.
3. Most students reported an overall preference for conventional textbooks. However, if given an opportunity to use an eText simultaneously with a conventional book, many would choose that option provided the eText was affordable.
4. Barriers included readability, eyestrain, insufficient resolution, zooming and scrolling difficulties, not readable on some mobile devices, and a dislike of reading on a computer or other device.
5. Very few students reported web accessibility problems (8%).

Indiana

1. A majority of the comments spoke to the students' preferences for a paper text vs. eText with several students citing that reading on a computer screen was difficult and resulted in eye strain.
2. The students were very critical of the Zoom feature in Courseload, especially on mobile devices.
3. There were some negative comments about the need to be connected to use the eText and also some comments about usability in general. It appears that students were unaware that they are able to use the eText offline which speaks to the need to educate students about this option.
4. The students appreciated the Search capability in Courseload.
5. There were virtually no comments about the features of Courseload enhancing their learning. This could simply be that the eText features were not extensively used by the faculty member teaching the course.

Minnesota

1. Most unhappy with the platform and/or eText features
2. Most unhappy the eText was not downloadable for off-line access
3. Features clumsy, difficult to use (e.g., highlighting)
4. Difficult reading on screen, zoom features worked very poorly
5. Most prefer paper textbooks
6. Like portability and that eTexts were "free" in the pilot

Virginia

1. A number of students reported challenges at first in learning to use the eReader
2. A number of students complained about the resolution of the eTexts, especially of images and figures
3. There was a significant amount of discontent about the zoom feature
4. Improvements to navigation functionality were requested
5. Students really liked the convenience of not carrying a stack of books

Wisconsin

1. Consistent with other institutions students frequently cited “text quality issues” including criticism of the zoom feature, fuzziness, and general eye strain.
2. Connection/ usability issues were also common comments.
3. Price concerns were also common, but that is likely because of a set of close-ended questions on price considerations that preceded this open question.
4. When presented with a choice between the two formats, the majority of students overall preferred paper textbooks.
5. Interestingly, there was a group of students that even though their ratings exemplified a less than positive eText experience, they were happy that the university was exploring this option.
6. When students were asked to compare paper textbooks and e-textbooks head to head in terms of what provided a better learning experience, 54% gave a significant or slight advantage to paper, 25% cited no difference.
7. About 20% of students thought eText was wonderful, and the “wave of the future.”

Findings from Student Focus Groups

Minnesota

1. Instructor engagement with the eText, for the most part, was minimal, had major impact on student experience
2. Student experience much better when instructor used features
3. Students would only purchase eText in the future if it were the cheapest option, some would not buy regardless of cost
4. Many students were not aware of features (e.g. sharing or linking to external content)
5. Many experienced technical issues (e.g., zooming, sharing, highlighting, printing and searching)
6. Some students thought that they read more because they could access the content online and did not have to carry their book with them

Wisconsin

No student focus groups were conducted at Wisconsin

Faculty Perspective

For many faculty, transitioning to a new way of teaching with an eText will very likely take time, and the pilot’s student survey findings also indicate a need to orient both faculty and students in using the new eTextbook technologies. One Indiana University faculty member said, “As exciting as it was, I still think I was barely using the eText to its potential.” Another IU faculty member indicated, “I didn’t use the Courseload features at all.” Minnesota faculty also reported that they did not make much effort to use the enhanced eText platform features.

The faculty that were interviewed at Indiana University said that having more assistance from the teaching center on campus would have been helpful, even though they did not seek out any assistance. Having the teaching center take a more proactive stance with faculty who are using an eText early in the semester may help in encouraging the use of features and functionality in Courseload that promote learning.

Minnesota faculty agreed with students that the opportunity to help students cut their textbook costs was the major reason that they wanted to participate. Some faculty indicated that they had an interest in the new technology, felt that the transition to digital was inevitable, and wanted to get some first-hand experience with it.

Cornell reported that all pilot instructors found the basics of eText easy to learn, but none explored features in depth. All pilot faculty at Cornell, however, plan to use eTexts for courses in the future. They cited: convenience, flexibility and the technology's potential. *"I didn't tap the system's potential but it seems to me that eTexts definitely [support learning]."*

Minnesota faculty were more pessimistic about the platform citing issues with usability and legibility of text (especially diagrams and images). They did not believe that the eText enhanced student outcomes with some indicating that students read less. Most preferred printed texts.

Indiana

1. Faculty found the Courseload functionality to be very easy to use and appreciated that it was accessible directly through the learning management system.
2. Faculty were unaware of the Statistics feature in Courseload but felt that if they had known about it, they may have used the statistics to inform their teaching practices.
3. Lowering costs for students was a clear motivation in choosing an eText.
4. Faculty used very few of the features and functionality that are available through Courseload, but expressed the desire to do more in future semesters. They also said that having support from the teaching center on their campus would have been helpful even though they did not specifically seek out that type of assistance.

Minnesota

1. Major reason faculty interested in pilot was because eTextbooks would be free to students
2. Some faculty were interested in new technology; felt transition to digital was inevitable and wanted to get experience with it
3. Most made little or no effort to use the enhanced eText platform features (sharing notes/annotations, questions for instructor, reporting, etc.)
4. Most felt the quality of the platform (especially navigating) and eBook text quality was poor - hard to read (especially diagrams and images)
5. Most were frustrated and preferred print book
6. Most felt it did not enhance student outcomes, and some felt it resulted in poorer outcomes (e.g., students were reading less because of perceived greater difficulty of reading off of screen with internet connection)

Virginia

1. Faculty universally reported their happiness at being able to save their students money on books
2. They reported that they found the eReader functional and fairly easy to learn
3. They liked the ability to annotate the eText

Wisconsin

1. All faculty were grateful for having had the opportunity to participate in pilot.
2. Although few faculty expressed having difficulty with Courseload usability, none of them used the features to any significant extent. However, during closing interviews several faculty expressed regret in not having explored these features more fully and if given another opportunity would likely do so.
3. Many faculty expressed interest in better understanding how eTexts impact student learning and would like more data in this area.

Lessons Learned

Some of the key lessons learned from the multi- institutional pilot included:

- Cost was a major driver for both faculty and students interested in eTextbooks
- An eReader platform must be fully accessible to students who need visual accommodation
- A core feature set (highlighting, zooming, pagination) with high usability is critical to adoption
- An engaged faculty is critical to a successful student experience with digital course materials
- Students have high expectations for the quality of eTexts
- What's important is not just how to use the eText but also how to learn and how to teach with an eText.

Recommendations for Moving Forward with eText

Each institution in the pilot will likely follow a slightly different approach. Some will be participating in a follow-up, broader Internet2 implementation in fall 2012. There are some general considerations, however, that most of the participating institutions are likely to follow:

- Decide at each institution how to proceed in developing a plan for the optimal procurement, distribution, funding, and management of eTextbooks. Key issues include the role of open educational resources, volume pricing with commercial publishers, additional pilot projects, and whether to adopt a common eTextbook platform.
- Focus on the impact of eTextbooks on students as one of the most important considerations.
- Use the data from the eTextbook pilot to establish baseline criteria for metrics for decision making.
- Ensure that eTextbooks are available on a variety of platforms (i.e., tablets, laptops, mobile devices and not limited to sole source hardware, software, LMS or other proprietary components) to best meet the needs of students and faculty.
- Ensure that the eReader platforms used by higher education institutions provide full accessibility accommodations to students with disabilities (just getting a hard copy of a text is not a solution to accessibility issues).
- Engage faculty to take advantage fully of the capabilities of digital course materials to help faculty to teach better and students to learn better.
- Solicit faculty and student opinions to determine critical features necessary for eText adoption.
- Use inter-institutional organizations (CIC, AAU) to advocate that publishers improve accessibility and usability, and provide standard formats for electronic materials.
- Determine a method of evaluating eTextbooks independent of the eReader platform (e.g., evaluate multiple eText platforms).
- Work with content creators and publishers to fully take advantage of the new capabilities of technology platforms to improve student learning.
- Leverage what we learned in the pilot to make decisions about the implementation of eTextbooks and related academic technology.

Appendix A: Courseload Data

Courseload Data for U of MN, Cornell, U of WI, and IU - Spring 2012 Pilot Evaluation

Class and instructor names have been suppressed to provide for anonymity. Data is not provided for U of Virginia.

Minnesota

Section	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	**Total**
Instructor Name	-----	-----	-----	-----	-----	-----	-----	-----	
Number of sections	1	1	1	1	1	1	1	1	**8**
Number of faculty members	1	1	1	1	2	1	1	1	**9**
Total pages viewed	352	306	39	15	7	97	22	137	**975**
Number of markups	724	9	10	3	1	7	0	40	**794**
Number of bookmarks	2	5	3	0	0	3	0	2	**15**
Number of annotations	39	3	7	0	0	1	0	0	**50**
Number of sticky notes	37	1	0	3	0	1	0	4	**46**
Number of highlights only	646	0	0	0	1	2	0	34	**683**
Number pages read offline	0	0	0	0	0	0	0	0	**0**

Cornell

Section	Class #1	Class #2	Class #3	Class #4	**Total**
Instructor Name	-----	-----	-----	-----	
Number of sections	1	1	1	1	**4**
Number of faculty members	1	1	1	1	**4**
Total pages viewed	14	117	91	19	**241**
Number of markups	0	35	3	0	**38**
Number of bookmarks	0	0	1	0	**1**
Number of annotations	0	18	0	0	**18**
Number of sticky notes	0	1	2	0	**3**
Number of highlights only	0	16	0	0	**16**
Number pages read offline	0	0	0	0	**0**

Wisconsin

Section	Class #1	Class #2	Class #3	Class #4	Class #5	**Total**
Instructor Name	-----	-----	-----	-----	-----	
Number of sections	1	1	1	1	1	**5**
Number of students	0	0	0	0	0	**0**
Number of faculty members	1	1	1	1	1	**5**
Total pages viewed	11	26	283	7	112	**439**
Number of markups	4	10	93	0	78	**185**
Number of bookmarks	2	9	3	0	0	**14**
Number of annotations	0	0	6	0	1	**7**
Number of sticky notes	0	1	6	0	0	**7**
Number of highlights only	2	0	78	0	77	**157**
Number pages read offline	0	0	0	0	0	**0**

Indiana

Section	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	**Total**
Instructor Name	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
Number of sections	1	1	1	1	1	1	1	1	1	1	1	**11**
Number of students	0	0	0	0	0	0	0	0	0	0	0	**0**
Number of faculty members	1	1	1	1	1	1	1	1	1	1	1	**11**
Total pages viewed	161	37	580	4	5	303	84	224	203	62	237	**1900**
Number of markups	84	56	3	0	0	95	2	7	65	11	21	**344**
Number of bookmarks	0	1	3	0	0	0	0	7	2	1	2	**16**
Number of annotations	0	52	0	0	0	19	0	0	9	9	8	**97**
Number of sticky notes	32	1	0	0	0	3	2	0	7	0	0	**45**
Number of highlights only	52	2	0	0	0	73	0	0	47	1	11	**186**
Number pages read offline	0	0	0	0	0	0	0	0	0	0	0	**0**

Appendix B: Student Survey Responses

[Aggregated data from Cornell, Indiana, Minnesota, Virginia and Wisconsin. Items in yellow highlighted in findings section.]

1) Compared to paper textbooks, to what extent were your learning needs met by using an eTextbook:

Question	Not at all (1)	A little (2)	Somewhat (3)	Quite a bit (4)	A great deal (5)	Mean
Offered greater flexibility to learn the way I want.	17.02%	13.83%	23.40%	21.28%	24.47%	3.22
Made my study time more efficient.	32.26%	15.05%	22.58%	18.28%	11.83%	2.62
Increased engagement with course content.	31.52%	13.04%	34.78%	15.22%	5.43%	2.50
Helped me to better understand the ideas and concepts taught in this course.	26.60%	14.89%	32.98%	19.15%	6.38%	2.64
Helped me interact and collaborate more with classmates.	52.13%	19.15%	15.96%	11.70%	1.06%	1.90
Allowed me to interact more with my professor.	59.57%	17.02%	14.89%	7.45%	1.06%	1.73
Allowed me to better organize and structure my learning.	26.60%	15.96%	31.91%	17.02%	8.51%	2.65

2) Please select the choice that best matches your experience with eTextbooks:

Question	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
Using the eText the first few times was difficult for me.	8.89%	25.56%	22.22%	34.44%	8.89%	3.09
Using eTexts has become part of my learning routine.	11.36%	18.18%	34.09%	21.59%	14.77%	3.10
The instructor encouraged the use of the annotation, highlighting, and note sharing features of the eText throughout the course.	21.84%	25.29%	36.78%	12.64%	3.45%	2.51
The features and navigation with the Courseload application were easy to use.	2.25%	11.24%	32.58%	39.33%	14.61%	3.53
The annotation/collaborative features in the eText were distracting.	14.94%	18.39%	41.38%	18.39%	6.90%	2.84
I read more of the assigned material than I would have if it were a paper textbook.	27.47%	30.77%	25.27%	14.29%	2.20%	2.33
I plan to purchase eTextbooks over traditional textbooks in the future.	25.00%	15.91%	34.09%	20.45%	4.55%	2.64
I learned more from using the eText with highlighting and/or annotations (mine and others) compared to what I normally learn from paper textbooks.	28.74%	22.99%	35.63%	10.34%	2.30%	2.34
I highlighted and/or annotated more than I normally do with paper textbooks.	30.23%	23.26%	26.74%	15.12%	4.65%	2.41

3) How useful were the following eText tools and features when studying?

Question	Not at all (1)	A little (2)	Somewhat (3)	Quite a bit (4)	Extremely (5)	Mean
My own highlights and/or annotations.	33.70%	20.65%	28.26%	11.96%	5.43%	2.35
The instructors highlights and/or annotations.	44.57%	15.22%	29.35%	9.78%	1.09%	2.08
The material the instructor added to the eText.	45.05%	18.68%	23.08%	13.19%	0.00%	2.04
Other students; highlights and/or annotations in the eText.	60.44%	17.58%	20.88%	1.10%	0.00%	1.63

4) For each method below, write the percent of time you used to read the eText.

___% Paper Version of the eText

___% Tablet (e.g., iPad, GalaxyTab, Xoom)

___% Desktop Computer

___% Mobile Device (e.g., iPhone, Android/DROID, Windows Mobile)

___% Laptop Computer

	Paper version	Tablet	Desktop Computer	Mobile device	Laptop computer
20% or less	35%	38%	39%	84%	9%
20-40%	19%	22%	17%	10%	6%
40-60%	18%	21%	19%	3%	10%
60-80%	11%	4%	6%	0%	9%
80-100%	16%	14%	18%	3%	67%

5) What percent of the assigned readings in the eTextbook did you actually read?

20% or less	16%
20-40%	7%
40-60%	19%
60-80%	25%
80-100%	33%

The overall average percent read was 47.63 %.

6) Did you purchase a paper copy of the eTextbook?

#	Answer		Response	%
1	Yes		163	12%
2	No		1,186	88%
	Total		1,349	100%

7) When considering the purchase of a course eTextbook, rate the importance of each factor or feature below in making a purchase decision. The eTextbook....

Question	Not at all (1)	A little (2)	Somewhat (3)	Quite a bit (4)	Extremely (5)	Mean
is more environmentally friendly than traditional textbooks.	13.98%	18.28%	25.81%	24.73%	17.20%	3.13
has the capability to permit me to share notes or questions with the professor and other students.	22.83%	30.43%	26.09%	13.04%	7.61%	2.52
is more portable than traditional textbooks.	8.79%	6.59%	16.48%	29.67%	38.46%	3.82
includes bonus material (e.g. links to videos, self-assessments).	19.57%	18.48%	31.52%	18.48%	11.96%	2.85
is available for my entire academic career, not only for one semester.	12.90%	8.60%	29.03%	25.81%	23.66%	3.39
is accessible without an Internet connection.	13.98%	9.68%	22.58%	22.58%	31.18%	3.47
is readable on tablets (e.g. iPad, Galaxy).	29.03%	13.98%	24.73%	12.90%	19.35%	2.80
is readable on a handheld mobile devices (e.g. iPhone, Android phone).	23.66%	15.05%	25.81%	19.35%	16.13%	2.89
costs less than a used or rented traditional textbook.	5.38%	3.23%	19.35%	20.43%	51.61%	4.10

8) Did you have any web accessibility problems with the eText and associated materials? (i.e., difficulty accessing web content due to disabilities including visual, auditory, cognitive, speech, etc.)

#	Answer		Response	%
1	Yes		107	8%
2	No		572	43%
3	I don't have a disability that affects access		665	49%

Appendix C: Indiana University eTextbook Project

Information provided by Indiana University

Indiana University (IU) played an important role in making possible the spring 2012 multi-institutional pilot building on their own experience in the area. Over the last three years, the IU eTexts Initiative has focused on changing the way students purchase and interact with textbooks and other learning materials by utilizing the strength, size, and leverage of the university on behalf of its students, The Initiative is focused on implementing a model that delivers digital educational resources and supplements ("eTexts" - this includes textbooks, simulations, software, and other digital learning materials) to students at greatly reduced costs and in formats that enhance teaching and learning.

The IU eTexts Initiative has been piloted at IU since 2009, and went live in September 2011. The objectives of the IU eTexts Initiative are to:

- Substantially drive down the cost of eTexts for students
- Provide access to high quality educational resources -- in both digital and hardcopy formats -- that are valued by faculty and students
- Enable new tools for teaching and learning (e.g., social annotation, collaboration, ease of access); and
- Shape the terms of eTexts models to favor the interests of IU students and authors

The Initiative has developed a business model that allows authors, publishers and students to benefit from the ongoing shift of textbooks and supplements from print to digital. This model, dubbed the IU eText Fee Model, moves publishers and students away from the current textbook sales model that requires publishers to sell their materials at unreasonable prices, and students to search for ways (buying and then selling their textbooks, purchasing older editions of the textbook, not purchasing a textbook at all, seeking pirated textbooks) to lower the cost of their course materials.

IU entered into agreements with publishers and an eReader software provider on behalf of the students. This allowed IU to provide eTexts to their students at a much lower cost (approximately 50% of the cost of an eText offered in the marketplace) and without the restrictions that are common in the marketplace (limited ability to print, limited access to the text, limited number of devices on which to view the text). In exchange, IU developed the IU eText Fee Model that guarantees publishers 100% sell through by charging a fee for the content to every student in an eText section.

Here is how it works: A faculty member may choose to teach with an eText from one of the publishers that have contracted with IU. After the eText selection is made, each student is informed before registering that they will be charged an eText fee in lieu of a purchasing a textbook. After a student registers they pay a one-time reduced fee for access to the eText.

Students access their eText through a single sign on process that is integrated through Oncourse, IU's Learning Management System (Sakai software). The eTexts may be viewed on multiple devices through eReader software (HTML5 based) provided by Courseload, Inc. This software allows students to highlight and annotate their text, as well as collaborate and share notes with fellow students and the professor. Students are also able to print their eTexts at no additional cost, or purchase a print-on-demand version of the eText for an additional fee. Once the one-time-fee is paid for that eText, the student will have continued access to the eText while they are enrolled at IU.

Appendix D: University of Minnesota Accessibility Study – Full Report

Courseload eText Accessibility Review

Peggy Mann Rinehart, Associate Director, Disability Services
Phil Kragnes, Manager, Computer Accommodations Program
Tonu Mikk, Info Tech Professional, Disability Services
Davin Martinson, Access Programs Coordinator, Disability Services

As technology and digital materials become an ever larger component of teaching and learning, how they are used and their impact on diverse learning styles must be considered. This issue is compounded by technologies that are not accessible to students with disabilities using adaptive technology or are implemented in a way as to not be inclusive. As one student put it, "Why can't we just get books in formats we can easily manage: on tablets and smart phones?"

We had the opportunity to explore this intersection of learning styles and accessibility during the piloting and subsequent accessibility review of an E-textbook delivery application.

During Fall 2011, a number of universities participated in a pilot of the Courseload E-text platform. The Courseload application was used to deliver the course textbook, professors' notes and comments, supplemental and other course-related materials. Disability Services at the University of Minnesota conducted a series of explorations and focus groups to determine how the E-text and supplemental course materials delivered through Courseload are accessed and used by students with disabilities, what barriers are inherent in the Courseload applications, what accommodations are necessitated by the use of Courseload and what issues and risks might result from Courseload implementation. This is not intended as an extensive review of the Courseload application but rather, a preliminary look at some of the issues students with print disabilities or hearing impairment may encounter when attempting to access course materials delivered through the application.

We were also interested in exploring how students with print disabilities engage in learning: what strategies work, what don't. What materials are useful, what are not. After all, a destination is only the end of a journey. It is the journey, with all its trials and tribulations that gives us a more complete picture. So, let us tell you about the accessibility of the Courseload E-textbook application and the path to reach it, while glimpsing the experiences, thoughts, and emotions of those with whom we traveled.

Participants

A total of seven participants were recruited to evaluate the Courseload application: four students and three employees. Only one of the students (HM) was enrolled in a course in which Courseload was used to deliver the E-textbook and supplemental materials. Participants were asked to use their own computers and adaptive technologies in order to preserve customized configurations and settings. Only one participant (LM) did not complete the evaluation as a result of work-related responsibilities.

Participant	Disability	Adaptive Technology
LM	Blind	JAWS
MM	Blind	JAWS
PK	Blind	JAWS
TM	Deaf	Captioning
MH	Learning Disability	Kurzweil 3000
JB	Learning disability, Hearing Impairment	Kurzweil 3000
NP	Low vision	ZoomText

Method

Professional Assessment

Phil Kragnes, Manager, Computer Accommodations Program, and Tonu Mikk, Information Technology Professional, Disability services, conducted an accessibility review of the Courseload application and course materials for APEC 1101 Principles of Microeconomics (section 001) — one of the courses in the University of Minnesota Spring 2012 Courseload E-text pilot. The focus of this evaluation was on screen reader access and was conducted using JAWS 12. The following questions guided the review:

- Can the contents of the E-textbook be located and identified?
- Can the content be navigated?
    - Turn pages
    - Jump to a specific page
- Can the instructor's notes and digital materials be accessed?
- Can highlighting, annotations and other additions be made to the E-textbook?
- Can a document be uploaded?
- Is the uploaded document accessible?

Focus Group

A total of four individuals participated in a focus group accessibility assessment of the Courseload application interface, the E-text and supplemental materials delivered through Courseload. All focus group participants were provided with lunch (see Appendix C) and student participants received a $25.00 gift certificate for the University of Minnesota bookstore.

Student evaluators were experienced users of their adaptive technology, which included the following applications:

- JAWS For Windows — a Windows screen reader primarily used by individuals with little or no usable vision.
- Kurzweil 3000 — a text-to-speech literacy system primarily used by individuals with learning disabilities.
- ZoomText — a screen magnification and contrast adjustment application primarily used by individuals with low vision.

Students used their personal laptop computers in order to preserve any custom settings. All student participants use Microsoft Internet Explorer as their preferred browser.

Although the focus group participants were not given initial instructions as to which browser to use, they quickly discovered that task completion was not possible with Internet Explorer and were subsequently informed that Mozilla Firefox or another ARIA compliant browser would be required.

Participants were instructed in accessing the Courseload application through the University of Minnesota "my" portal and the APEC 1101 Principles of Microeconomics (section 001) Moodle course site (see Appendix A). Upon launching the Courseload application, the students were directed in a series of tasks that mirrored those used in the professional assessment.

Student Debriefing

HM, a student with a print disability who was enrolled in APEC 1101 Principles of Microeconomics (section 001) for the Spring 2012 semester was interviewed regarding his experience with the course, instructor, Courseload/E-text and other course materials (see Appendix D). He received a $25.00 University of Minnesota bookstore gift certificate for participating.

Methods and Procedures

The professional assessment was conducted in two phases. Phil Kragnes and Tonu Mikk began with an unguided exploration of the Courseload E-textbook application. Mr. Kragnes focused on screen reader and speech recognition accessibility, while Mr. Mikk focused on low vision and deaf/hard-of-hearing access. The experience and findings provided the basis for the protocol used in this study.
Student focus group participants were gathered in a single location and received identical instructions. Four staff members were present to observe and provide assistance when a task could not be completed using a specific adaptive technology. A collaborative atmosphere quickly developed with students encouraging and assisting each other.

Results

The initial professional assessment revealed that much of the Courseload application interface is accessible to users of adaptive technologies such as JAWS, ZoomText, and NaturallySpeaking. However, there are some controls that do not appear in the tab order or do not provide text labels. Without text labels, these controls are not identified and cannot be targeted by applications such as JAWS and NaturallySpeaking.

The contents of the textbook are presented as an image, presenting a barrier to most of the adaptive technologies represented in this evaluation. The only textual information available to the JAWS screen reader in the general location of the textbook content was the current page number. This inability to access the text precludes any attempts to add notes or other text-location specific information. Similarly, users of speech recognition applications, such as NaturallySpeaking, will not be able to target locations within the text.

Although it is possible to move forward and backward by page, there is no keyboard-operable means of jumping to a specific page. When on a page that contains notes or adjunct material provided by the professor, screen reader and screen magnification users may not be aware of its existence. This may hold true for some individuals with learning disabilities.

The rendering of the textbook content as an image raises the question as to how accessible local materials are rendered when uploaded to Courseload. An accessible PDF was uploaded. Although an accessible Table of Contents was generated, the formerly accessible PDF was displayed as an inaccessible image.

Focus group participants, with assistance from staff, spent approximately one hour traversing the Moodle course site (see Appendix A) to arrive at the and APEC 1101 Principles of Microeconomics (sec 001) Spring 2012 textbook being delivered by Courseload. The students, particularly those with visual impairments, reported they generally avoid the use of Moodle, as they find it confusing, frustrating, and fatiguing. The Courseload task completion results were very similar to those discovered in the professional assessment.

Task	JAWS	Kurzweil	ZoomText
Can the contents of the E-textbook be located and identified?	The textbook content is displayed as a graphic and cannot be accessed by JAWS.	The image representing the textbook content cannot be directly accessed by Kurzweil 3000 or imported for Optical Character Recognition (OCR).	The textbook content can be viewed with ZoomText. However, increasing magnification in ZoomText results in highly pixilated text and images. There is a native magnification feature in Courseload but it only offers three discreet magnification settings.
Can the content be navigated?	Although many of the controls can be identified and activated, there is a lack of headings to aid navigation. Some widgets are not directly exposed and the triggers are often not identifiable or keyboard operable.	N/A	A lack of headings and the modular layout of the interface made navigation confusing when using low to moderate magnification.
Turn pages	"Next" and "Previous" controls were identifiable and keyboard operable.	N/A	"Next" and "Previous" were not adjacent controls and required a brief search.
Jump to a specific page	The control was embedded as an AJAX widget and was neither identifiable nor keyboard operable. NOTE: once the "jump to page" feature was exposed with a mouse-click by a staff assistant, the control was still not exposed to the screen reader.	N/A	The feature could be identified and activated, but only with a mouse.

Can the instructor's notes and digital materials be accessed?	Neither instructor notes, student notes, nor other adjunct materials were accessible. NOTE: once exposed with a mouse-click by a staff assistant, note contents and embedded links could be read by JAWS and activated using the keyboard.	Notes were not clearly labeled and required the clicking of a yellow button to display the feature.	The unlabeled yellow control was difficult to locate and may result in additional barriers if alternative color schemes are employed.
Can highlighting, annotations and other additions be made to the E-textbook?	Given that the textbook content is rendered as an image, it is impossible to add notes or annotations to the document. NOTE: the inability to target a location in the text prevented an evaluation of study skill features.	Given that Kurzweil offers its own set of study skills tools, it was not clear as to how to add highlighting, notes, and annotations to the document.	The delineation between textbook content and note content was not clear.
Can a document be uploaded?	Uploading a document was straight forward.	Uploading a document was straight forward.	Uploading a document was straight forward.
Is the uploaded document accessible?	The uploading of an accessible (tagged) PDF resulted in an accessible Table of Contents but the document was rendered as an inaccessible image.	Once in Courseload, the document could not be imported into Kurzweil.	The uploaded document presents the same issues as described with the textbook.

Although NaturallySpeaking was not used in this evaluation, many of the issues encountered by screen reader users apply. Speech recognition systems require textual elements for targeting. Therefore, targeting and activation of the unlabeled yellow notes control would not be possible without using NaturallySpeaking's built-in "mouse grid" function. Targeting a location within graphically represented text would likewise be impossible.

Summary and Conclusions

Both the skilled professionals and the students encountered similar accessibility issues in their attempts to access the APEC 1101 Principles of Microeconomics (section 001) textbook and other course materials as delivered through the Courseload application. Although the types and severity of disabilities vary greatly, even a user with a single mild impairment that requires a technology accommodation would find it difficult, if not impossible, to make use of the current Courseload application.

We were unable to evaluate a native copy of the textbook as provided by the publisher. However, we can make some assumptions regarding access to the textbook when delivered using Courseload. Given that the uploading of an accessible (tagged) PDF document resulted in a graphically rendered inaccessible document, we infer that all E-text publications will be displayed in the same inaccessible manner.

Students enrolled in E-text courses using Courseload have a print copy of the textbook converted using Optical character recognition and imported to accessible scan and read, rtf for other formats.

There appears to be a need for efforts on three fronts. First, faculty and course developers must be made aware of accessibility and learning style considerations. They must also be given the resources and encouragement for understanding and implementing a universal design for learning approach. Second, universities, colleges, government entities, and other organizations need to collaborate in putting pressure on publishers to produce accessible E-texts. Thirdly, the tools used to deliver E-text content must be accessible and not interfere with natively accessible materials.

We understand that Courseload has a desire to make their product and delivery of E-texts accessible. They should certainly be applauded and encouraged. However, we cannot recommend the use of the Courseload application at this time. As a University of Minnesota compliance partner, the accessibility issues outlined in this document would put the University of Minnesota at risk for litigation. We cannot support the adoption of an application or system that allows instant access to course materials for all but those with disabilities.

Appendices

Appendix A

Accessing course content and materials in Moodle 2.0

All courses involved in the Courseload E-textbook pilot at the University of Minnesota are hybrid courses, incorporating both online and in-class instruction. Each participant was asked to complete specific tasks within the Moodle LMS course environment, report his/her success or failure, and provide feedback.

Summary of participant experience in the Moodle 2.0 course environment

Moodle utilizes AJAX widgets, requiring the use of an ARIA (Accessible Rich Internet Application) compliant browser. Microsoft Internet Explorer 8 and earlier — the most commonly used browsers by users of adaptive technology — are not ARIA compliant and will not render some content. All of the Focus Group participants began with Microsoft Internet Explorer and quickly discovered numerous issues, including missing content and inoperable controls.

Participants were asked to locate, identify, and interact with various areas of the Moodle course interface. Users who are able to use a standard pointing device (mouse or trackball) had little difficulty in navigating the Moodle course site. However, screen reader users had a difficult time understanding, navigating, and interacting with elements on the site. The following table illustrates some of the issues encountered by screen reader users.

Section	Ind.	Comments
Settings	Y	Identified as a level 2 heading.
Calendar	Y	Identified as a level 2 heading.
Events	Y	Identified as a level 3 heading.
Syllabus/Mock Trial Info/CPS Clicker Registration	Y	Located using the screen reader "find" feature.
Homework Assignments	N	Label not identified as a "clickable" element and it does not appear in the tab order. Assistance was required to expose the homework assignments, which could then be acted upon independently.
Navigation	Y	Identified as a level 2 heading.
Navigation/Lecture Notes	?	The "Lecture Notes" heading and the individual notes are identifiable and operable. However, the notes are PowerPoint slides presented as PDF documents (24 items). By default, most browsers are configured to open PDF documents in the browser, making the contents and related controls inaccessible to screen readers. The Mozilla Firefox browser should be configure to open PDF documents in the external Adobe Acrobat Reader application (See Appendix B)

It took student participants an average of one hour and frequent assistance from staff to complete the following tasks:

1. Access and navigate the Moodle course site
2. Locate and launch the Courseload E-textbook application for **APEC 1101 Principles of Microeconomics (sec 001) Spring 2012.**

Appendix B

Configuring Firefox to open PDF documents in the Adobe Reader application

By default, most browsers are configured to open PDF documents in the browser window. This prevents screen readers from accessing the PDF content and document controls, as there is no trigger to cause the screen reader to switch from browser to Adobe Reader/PDF interaction mode. The solution is to configure the browser to open PDF documents in the external Adobe Reader application.

Steps for configuring Firefox to open PDF documents in the external Adobe Reader application

1. Launch Mozilla Firefox®.
2. Open the "Tools" menu.
3. Select "Options".
4. Select "Applications".
5. Select "Adobe Acrobat Document" as the Content Type.
6. Select "Use Adobe Reader" as the Action.
7. Click the "OK" button.

Appendix C

Informal Discussion with Students Regarding Course Materials and Accessibility

As part of an informal lunchtime discussion, student participants were asked the following questions regarding their experiences with access to course materials and online learning:

1. What was your best learning experience?
2. Do you like to read?
3. What is your most enjoyable reading experience?

It is no surprise that these students, despite maintaining a B average or better, report that they struggle with reading. The notion of reading for pleasure is alien.

- With so few words on the screen at any given time, screen magnification users struggle with context, clarity and identification of enlarged text and images, and continuity from screen-to-screen.
- Screen reader users face myriad challenges including difficulty determining the structure and layout of Web content because heading tags are often used incorrectly or not at all, images lack alternative text or the alternative text is inappropriate, textual information is presented as an image, and many other design, layout, and technology related issues.
- Users of scan-and-read systems generally do not have difficulties with application and document navigation, but the document content is unavailable to the adaptive technology; thus, eliminating text highlighting, dictionary and thesaurus features, read aloud capabilities and other helpful or necessary utilities.
- Students express the need to "self-select" out of courses needed to pursue a preferred major. One student expressed a deep desire to become a genetic counselor. As a high achieving student living with genetically inherited vision loss, she could clearly be an asset to the field. But, she assumed that mastering organic chemistry, given her visual impairment, would exceed her abilities.
- Students complained that they, unlike their peers, are tethered to laptop and desktop computers.
- Many use Apple's built-in VoiceOver screen reader on their iDevices to access the Web and their email.
- When reading for pleasure, some use iDevices, others use a Victor Reader Stream or other digital talking book player, and some use Braille.

Like their peers, these students are eager to access learning materials simply, conveniently through technology that is intuitive and streamlined — "Why can't we just get books in formats we can easily manage: on tablets and smart phones?"

Appendix D

Student Debriefing

This student is a seasoned learner who maintains a B+ average. He chooses his classes carefully, weighing the classroom environment, course content and delivery, and how students are evaluated. And of course, how it fits into his course of study and major. The following are his thoughts on **APEC 1101 Principles of Microeconomics.**

"I don't need the textbook to succeed in the course. I didn't do the required readings." Dr. Lu makes it easy:

- His lesson plans are clear
- The power point presentations are on line in an accessible format
- His notes are on-line."

The student focuses on listening in class and is able to take his own notes. "Dr. Lu's presentations made listening easy."

> Most of the comments and videos Dr. Lu embedded in Courseload, he showed during class as well. Dr. Lu presented most of the material in several different ways; he didn't rely on the textbook alone.

Because the student had agreed to meet with the accessibility team, he did try to access the version of the textbook provided by Document Conversion in the Kurzweil format. The student has been developing his own workarounds for many semesters, and thinks Kurzweil might be helpful but really hasn't used it much. He uses everything he can, visual, auditory, overall impressions, reading glasses, zoom text, anything he can to master the material.

For this student and others with print disabilities, "learning is a roller coaster ride."