

eContent Executive Summary

Fall 2013 Pilot

The following executive summary details the findings of the eContent pilot conducted at the University of Arizona during the Fall 2013 semester on the Courseload software platform.

The eContent team has learned that the eContent industry is in the midst of rapid and continuous growth, and is not yet able to deliver a scalable product or adequate support of a significant rollout. As detailed in *The eContent Landscape*, which can be found on the “Resources” tab, the market is saturated with applications that offer various combinations of functionalities and cost models. Many publishing companies have also joined the competition by providing proprietary eContent applications.

These software choices, coupled with the UA’s culture of academic freedom, indicates that more than one eContent solution would be necessary to meet the current needs of campus.

UA faculty and students are already using multiple eContent platforms on their own. Students have discovered cost-savings by renting digital textbooks. Instructors are benefiting from teaching with eTexts provided on publisher-owned platforms that are often prepackaged with homework questions, quizzes, and tests.

The existing eContent use raises the very important issue of accessibility. Due to liability concerns, priority needs to be placed on the accessibility of any eContent application used on campus. The DRC agrees with the eContent team’s findings that Courseload is currently not usable by anyone with a print disability, including the visually impaired.

Background

The Office of the Chief Information Officer (CIO) is sponsoring a collaborative effort to assess eContent for its appeal and pedagogical benefit, scalability, and ease of integration with the UA campus learning environment. Campus partners include University Information Technology Services (UITs), the Office of Instruction and Assessment (OIA), UA BookStores, University Libraries, and Student Affairs.

The Office of the CIO provided funding for participation in the Fall 2013 pilot made available through the UA's relationship with Internet2 (I2) and EDUCAUSE. The CourseLoad software platform was chosen from three options, including CourseSmart and McGraw Hill Adaptive Learning, because it was the sole option that supported eContent from any publisher. The software also integrates with UA learning management systems (LMS), such as Desire2Learn and BlackBoard. Additionally, a small-scale pilot was successfully conducted with CourseLoad at the UA in Fall 2012 by the University Libraries in Dr. Leslie Eldenburg's ACCT 310 class.

Contracts

The pilot required a contract between the UA and Internet2 and another between the UA and CourseLoad. The I2 contract granted participation in the pilot and access to 5,000 pre-contracted eTextbook titles. I2 negotiated discounted rates on the pre-contracted content and therefore provided access to it for only one semester. The I2 contract expired after the Fall 2013 semester.

The second contract was entered into with CourseLoad to provide the option for instructors to teach with a textbook other than those offered through the Internet2 contract.

Course Mix

Recruitment began in early June 2013 for the August 26th semester launch. CourseLoad recommended allowing six weeks to obtain the eContent from publishers and an additional two weeks for instructors to markup the eContent prior to the start of the semester.

In addition to three Eller faculty participants who are members of the Oversight Committee, the working team recruited four additional faculty in accordance with the following course criteria which was decided upon by the Oversight Committee:

- Diversity of Class Size
- Diversity of Colleges
- Diversity of Departments
- Diversity of Materials
- Use of Library and other institutional materials
- Faculty willingness to participate

In addition to contacting faculty who were suggested by the Oversight Committee, the working team referenced the BookStores' Fall 2013 textbook adoption list to identify a diverse mix of potential courses and faculty who requested textbooks that were available through the I2 contract. Ultimately, the pilot courses spanned 3 colleges, 5 departments, 7 subjects, and 8 sections. Courses ranged from the 100 level through the 500 level with enrollment from 27 – 90 students. Total student enrollment, determined after the final course drop date of September 22nd, was 443.

Pilot Courses:

Instructor Name	Subject	Catalog	Section	Course Name	Final Enrollment
Mary Beth Haralovich	FTV	100-A	1	Film and Television	90
Bill Neumann	MIS	111	Honors	Computers and the Internetworked Society	74
Leslie Eldenburg	Acct	310	1	Intermediate Cost Accounting	35
Leslie Eldenburg	Acct	310	2	Intermediate Cost Accounting	30
Andrew Grall	CHEM	325	1	Analytical Chemistry	66
Rohit Thomas	Math	425-A	1	Real Analysis of One Variable	27
Joceline Lega	Math	425-A	2	Real Analysis of One Variable	31
Joe Valacich	MIS	541	1	Information Systems Analysis & Design	90
					443

eContent Ordering and Costs

Courseload advertises multiple publisher relationships and the ability to obtain and support any eContent. Two of the seven pilot eTextbooks were available immediately through the Internet2 contract. Additionally, Dr. Eldenburg's eText had already been obtained for the Fall 2012 pilot; Dr. Valacich authored his own textbook; and Dr. Neumann pre-negotiated the eText cost with the authors of his course book.

Despite these benefits, the process of obtaining the four remaining eTextbooks was arduous and time-consuming. Initial communications to learn if a text was available in digital format took 2-3 weeks. Depending upon the publisher, an additional 3-6 weeks was needed to negotiate how long users would have access to the eContent and the associated fee. It could then take up to 6 weeks to digitize the textbook if it was not already available in that format.

We learned that the BookStores staff are best positioned to procure the eTextbooks due to their expertise, knowledge of competitive pricing, and established publisher relationships.

eContent Costs:

Subject	Publisher	Length of Access	eContent Cost per Student	Total eContent Cost
FTV 100A-001	McGraw Hill Higher Education	1 Semester	\$0 (I2 Contract)	\$0.00
MIS 111 Honors	Contracted with authors	While enrolled at UA	\$17.50	\$1,295.00
Acct 310-001	John Wiley & Sons, Inc	While enrolled at UA	\$66.15	\$2,315.25
Acct 310-002	John Wiley & Sons, Inc	While enrolled at UA	\$66.15	\$1,984.50
CHEM 325-001	Macmillan Higher Education	1 Semester	\$0 (I2 Contract)	\$0.00
Math 425A-001	American Mathematical Society	While enrolled at UA	\$49.20	\$1,328.40
Math 425A-002	American Mathematical Society	While enrolled at UA	\$49.20	\$1,525.20
MIS 541-001	Pearson Higher Education	While enrolled at UA	\$55.00	\$4,950.00
				\$13,398.35

Training and Orientation

Courseload provided faculty training videos with interactive exercises. The average time to complete all five modules was one hour. During the faculty recruitment process, Cheryl Cuillier (Assistant Librarian, University Libraries-Instructional Services Team) and Garry Forger (OIA Officer, Development-Grants Management) provided software demonstrations to each faculty participant.

Dr. Leslie Eldenburg recorded a faculty webinar to share her previous Courseload experience and to provide best practice suggestions.

A kickoff meeting was held prior to the semester for participating instructors and teaching assistants to meet and ask questions of the working team and Ryan Hively of Courseload. Ryan also demonstrated the functionalities of the software.

Once the semester was underway, Cheryl and Garry attended the pilot classes to provide student orientation and conduct Q&As. Six of the seven faculty participants accepted this offer of student training.

IT Support / Functionality Issues

The working team coordinated with the 24/7 IT Support Center to provide pilot background and answers to tier 1 issues that they may encounter during the pilot. 24/7 reported that they did not receive any inquiries pertaining to Courseload.

Most support issues were reported to Jason Masciantoni (Principal Business Analyst, Enterprise Applications) who forwarded them to Courseload through their ZenDesk tracking system. Cheryl, Garry, and Mary Ellen Flynn (Project Manager) also received faculty and student reports of issues and questions throughout the semester. These issues were usually handled through phone calls and emails with Courseload, and sometimes forwarded to Jason to submit through the tracking system.

The most significant functionality issues reported include:

1. **Accessibility**: Courseload's website states that they meet all Section 508 guidelines and Web Content Accessibility Guidelines (WCAG) and that they undergo audits to maintain compliance. Our research shows that the software is not usable for anyone with a print disability, including visually impaired, as most of the documents appear as one image rather than as individual characters. We found that this approach eliminates the value of many Courseload functionalities. Dawn Hunziker of the Disability Resource Center (DRC) finds the software severely limiting in what users with print disabilities can access which is not always equitable to what their class peers can access. No pilot participants had a print disability.
2. **Analytics**: Courseload-provided analytics were not reliable or consistent. Reports of questionable or false data were usually explained by a non-intuitive definition of what the numbers actually represented. For example, when we questioned high page printing statistics in Dr. Eldenburg's course, we learned that Courseload's analytics are cumulative, and therefore included stats from the 2012 pilot. Data for students who dropped the course were also included in the final stats.
3. **Offline Access**: The offline functionality, which was intended to allow users to access and update content without internet access and then synch when back online, did not work throughout the pilot. This issue was not resolved and was also encountered during the previous Fall 2012 pilot.
4. **Mobile**: Courseload did not work well enough to be used on a mobile device.
5. **Internet Explorer**: Courseload did not work consistently or well on Internet Explorer.
6. **Search feature within notes**: Searching was only available for a student's own notes, not faculty's or other students' notes. This limitation was not previously specified and therefore resulted in issue reports.
7. **Highlighting**: Users could not control where a highlight began or ended.
8. **Uploading content**: Faculty had significant problems when attempting to upload eContent to Courseload. Any additional content had to be sent to Courseload in advance to be uploaded.
9. **Math and Chemistry Characters**: Courseload does not recognize and support all characters, including those used in some Math and Chemistry formulas. See detail below.

Formula as shown in eText:

Solution First calculate \bar{x} ($=12.5_4$) and s ($=0.4_0$) for the five measurements. For the 50% confidence interval, look up t in Table 4-2 under 50 and across from *four* degrees of freedom (degrees of freedom $= n - 1$). The value of t is 0.741, so the 50% confidence interval is

Formula after being highlighted and saved as a note in Courseload:

First calculate \bar{x} ($=12.5_4$) and s ($=0.4_0$) for the five measurements. For the 50% confidence interval, look up t in Table 4-2 under 50 and across from four degrees of freedom (degrees of freedom $= n - 1$). The value of t is 0.741, so the 50% confidence interval is $\bar{x} \pm t s$ $= 12.5_4 \pm (0.741)(0.4_0)$ $= 12.5_4 \pm 0.3$ ≈ 12.2 to 12.8 . The 90% confidence interval is $\bar{x} \pm t s$ $= 12.5_4 \pm (1.753)(0.4_0)$ $= 12.5_4 \pm 0.7$ ≈ 11.8 to 13.2 .

Pilot Data

Pilot data was collected from the following sources:

1. Beginning of semester surveys – faculty and students
2. End of semester surveys – students
3. End of semester interviews – faculty
4. Courseload-provided analytics
5. Instructor-provided analytics generated through Courseload
6. Dr. Neumann’s eContent assessment assignment for participating students
7. Email feedback – faculty and students
8. Anecdotal – faculty and student

This report uses the following definitions:

- “Highlight Only” - a highlight with no text [most frequently used in pilot]
- “Annotation” - a highlight with associated text [frequently used in pilot]
- “Bookmark” - enables a user to return to a certain page [less frequently used in pilot]
- “Page Note” or “Note” - a note without an associated highlight or a particular position on the page [least frequently used in pilot]
- “Markups” - total numbers of bookmarks, annotations, page notes, and highlights

Faculty Behavior

Six of the seven pilot faculty members used Courseload to teach their courses. Therefore, this report refers to the feedback from those six instructors.

Each instructor created a unique approach to using Courseload to best suite their pedagogical style and course subject matter. Each communicated a color-coding system to their students to help identify information such as exam alerts, homework problems, group work, and key issues.

Below are examples of notes made by two different instructors. Both chose red to indicate exam alerts. The instructor in the first example began each annotation with the label “Exam Alert”, whereas the second example shows how another instructor utilized the tag function for the same purpose.

Instructor's note Close

Exam Alert: Very important in relational database modeling. Know both ways to draw these in an ERD

Associative entity
 An entity type that associates the instances of one or more entity types and contains attributes that are peculiar to the relationship between those entity instances.

relationship actually an entity and relationship is simply an entity type. Figure 7-7 shows the relationship as an associative entity. They are not two separate binary relationships. **EMPLOYEE and COURSE**

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Leslie Eldenburg 8/8/2013 8:09 AM

Learn the revenue-related variances but not the others.

Exam alert

The below screenshot demonstrates how Dr. Haralovich shared links to videos with her Film & Television class by inserting an annotation where the film is discussed in the eContent. Prior to the pilot, she shared these links in D2L.

The screenshot shows a web browser window displaying the Courseload interface. The main content area features a video player for "Film History: An Introduction, 3e" by Kristin Thompson and David Bordwell. The video player has a play button and a progress bar. To the right of the video player, there is a text area with the following content:

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ences. With a little imagination, though, we can see that people then were probably interested in films for much the same reasons that we are. Every type of early film has some equivalent in contemporary media. The glimpses of news events, for example, may seem crude, yet they are comparable to the short clips shown on television news programs. Early scenics gave viewers glimpses of faraway lands, just as today college and church lectures and televised documentaries utilize films to show sim-

Instructor's note Close

The Dog Factory (1904) - proscenium, single shot, continuous take. http://archive.org/details/00og_factory_1904

a position they have held ever since.

Most films in this early period consisted of a single shot. The camera was set up in one position, and the action unfolded during a continuous take. In some cases, filmmakers did make a series of shots of the same subject. The resulting shots were then treated as a series of separate films. Exhibitors had the option of buying the whole series of shots and running them together, thus approximating a multishot film, or they might choose to buy only a few of the shots, combining them with other films or lantern slides to create a unique program. During this early period, exhibitors had considerable control over the

Instructor's note Close

actualities: demolition of the Star Theater, New York street scene http://streaming.oia.arizona.edu/clientFlashABR/play.php?clipname=/perm/ftv100/paper_prints/protected/web_sml&align=left&help=on&autoplay=off

The new medium of film moved smoothly into this spectrum of popular entertainment. Like the early films that we have already mentioned, most subjects were nonfiction, or actualities. These included scenics, or short travelogues offering views of distant lands. News events might be depicted in brief topicalities.

Dr. Lega created a work-around, illustrated below, for Courseload's inability to recognize math formulas (mentioned previously in the IT Support section) to successfully teach her Math 425A course. She hand-wrote solutions to math exercises, converted them to PDFs, and had them uploaded into Courseload. She then created annotations within the eText at the corresponding math exercise and inserted the link to the solution.

You can also see that she labelled the note "Solution," and tagged the note with the identifier "HW, Week 9" to indicate that the exercise was homework for week 9 of class.

Proof
 We will express the function, $f: [0, \infty) \rightarrow \mathbb{R}$ as the composition of continuous functions, and hence, by Theorem 3.6, $f: [0, \infty) \rightarrow \mathbb{R}$ is continuous. Indeed, define

$$g(x) = x^{1/n} \quad \text{and} \quad h(x) = x^n \quad \text{for } x \geq 0.$$

By definition,

$$f(x) = g(h(x)) = (g \circ h)(x) \quad \text{for } x \geq 0.$$

The function $h: [0, \infty) \rightarrow \mathbb{R}$ is continuous since it is a polynomial and, by Theorem 3.29, the function $g: [0, \infty) \rightarrow \mathbb{R}$ is continuous since it is the inverse of a strictly increasing function defined on an interval. ■

EXERCISES FOR SECTION 3.6

1. For each of the following statements, determine whether it is true or false and justify your answer.

Instructor's note Close

Solution: <https://arizona.courseload.com/#material/214>

TAGS: HW, Week 9

b. $h: (0, 1) \rightarrow \mathbb{R}$ defined by $h(x) = 1/(x^2 + \mathbb{R}x)$ for $0 < x < 1$.

4. Define

$$f(x) = \begin{cases} x - 1 & \text{if } x < 0 \\ x + 1 & \text{if } x \geq 0. \end{cases}$$

Show that $f: \mathbb{R} \rightarrow \mathbb{R}$ is strictly increasing and that $f^{-1}: f(\mathbb{R}) \rightarrow \mathbb{R}$ is continuous at 1.

5. Let $D = [0, 1] \cup (2, 3]$ and define $f: D \rightarrow \mathbb{R}$ by

$$f(x) = \begin{cases} x & \text{if } 0 \leq x \leq 1 \\ x - 2 & \text{if } 2 < x \leq 3 \end{cases}$$

Prove that $f: D \rightarrow \mathbb{R}$ is continuous. Determine $f^{-1}: f(D) \rightarrow \mathbb{R}$ and prove that $f^{-1}: f(D) \rightarrow \mathbb{R}$ is not continuous. Does this contradict Theorem 3.29?

6. A function $f: \mathbb{R} \rightarrow \mathbb{R}$ is said to be odd provided that

$$f(-x) = -f(x) \quad \text{for all } x.$$

Show that if $f: \mathbb{R} \rightarrow \mathbb{R}$ is odd and the restriction of this function to the interval $[0, \infty)$ is strictly increasing, then $f: \mathbb{R} \rightarrow \mathbb{R}$ itself is strictly increasing.

Faculty Feedback

Five of the seven faculty participants completed a pre-semester survey and six gave an end-of-semester interview. Faculty also contacted the working team throughout the semester when they needed information or to report an issue.

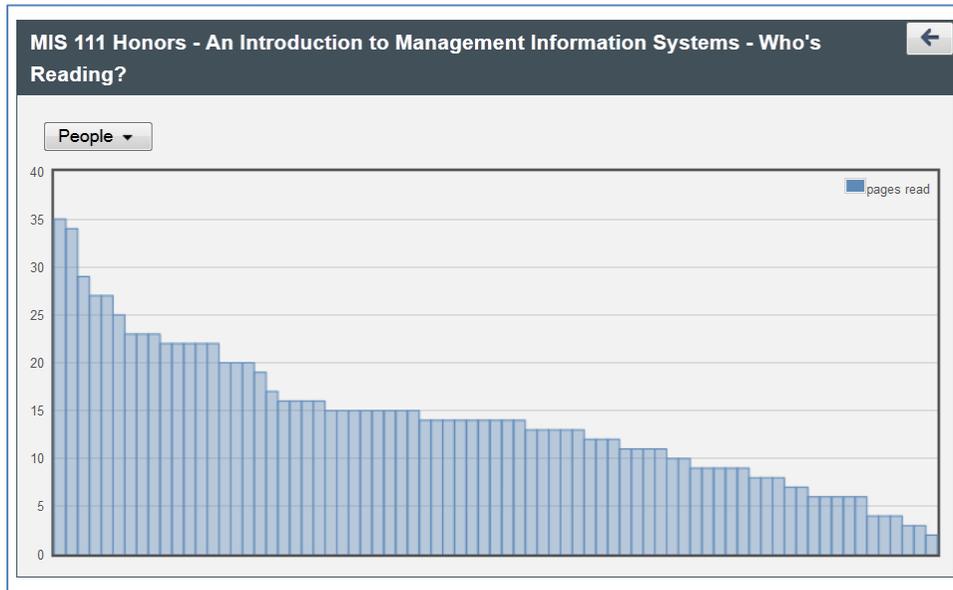
Of those who responded, all saw positive gains to using eContent and expressed interest in using it again for future classes. Even with the work they already invested into Courseload, all are willing to consider using other eContent platforms. All also characterized the overall student feedback they received as positive.

Faculty conveyed strong interest in having reliable analytics to tie student performance to engagement in the eContent. Some students used only a traditional text, but faculty stated that analytics would be a valuable tool and could be referenced when assisting students during office hours. However, Dr. Neumann stated that the analytics are not a good measure of engagement. In addition to having various learning styles, he pointed out that students could ultimately skew the data by clicking through the content without being engaged with it.

The examples below show how each of the 69 students (93% of class enrollment) in Dr. Neumann's MIS Honors course used the software. Faculty can identify individual student behavior by hovering the cursor above each bar in the graph to display the student's name.

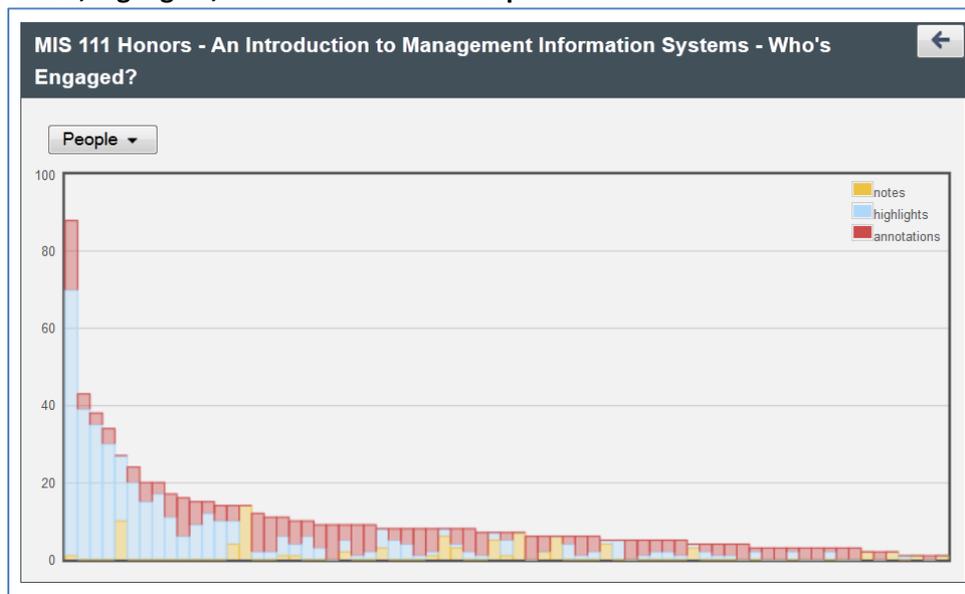
The following image displays the number of *unique* page views per student (versus *total* page views which would reflect multiple visits to the same page).

Unique pages read per student:



The following image shows per student creation of notes, highlights, and annotations. According to Courseload's end-of-semester student analytics, students made a total of 381 highlights, 72 notes, 12 bookmarks, and 229 annotations.

Notes, highlights, and annotations made per student:



There is faculty consensus on the need to limit student content costs. The lower cost of eContent versus traditional textbooks was a factor in each faculty member's interest in the pilot. They disliked the Courseload model of 100% sell-thru, which requires payment of content and seat fees for every student in a course, regardless of whether or not the student chooses to use the software.

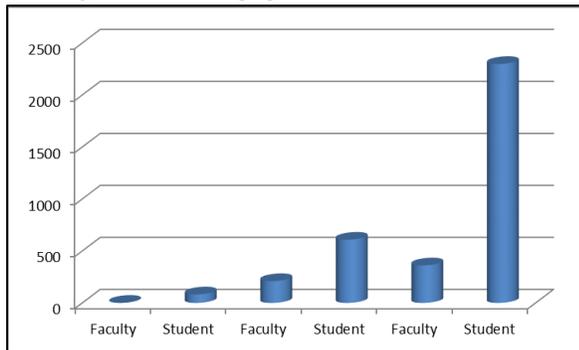
Dr. Neumann noted that over two-hundred of his MIS 111 students are Chinese and he fielded requests for a translated version of the eContent. He noted that international students generally bought a traditional text.

In terms of accessibility, none of the faculty were notified of any complications caused by the use of eContent. Two instructors stated that their only accommodation, which was not directly related to eContent, was to allow additional time to students for tests and quizzes.

Student Behavior

Student engagement in the eContent correlated directly with instructor engagement, as shown in the following two graphics.

Faculty/Student Engagement:



	Role	# Markups
Math 425 - 001	Faculty	1
	Student	82
Acct 310 - 001	Faculty	210
	Student	608
FTV - 001	Faculty	361
	Student	2,298

Two faculty reported that students would request that they markup upcoming course content if they had not yet done so. Faculty shared that students particularly appreciated having possible exam concepts and homework identified within the text.

Instructors also noted that students liked not having to carry a traditional textbook, but preferred them for some tasks, such as easily finding a specific graph or image on a page of text.

12% of the 177 students who responded to the end-of-semester survey purchased a traditional textbook in addition to the eText. 74% used only the eText and 7% said they used only a traditional textbook. Five students purchased the print-on-demand (POD) option of the eText through Courseload. The POD is a black and white, three-hole punched, loose-leaf version of the textbook.

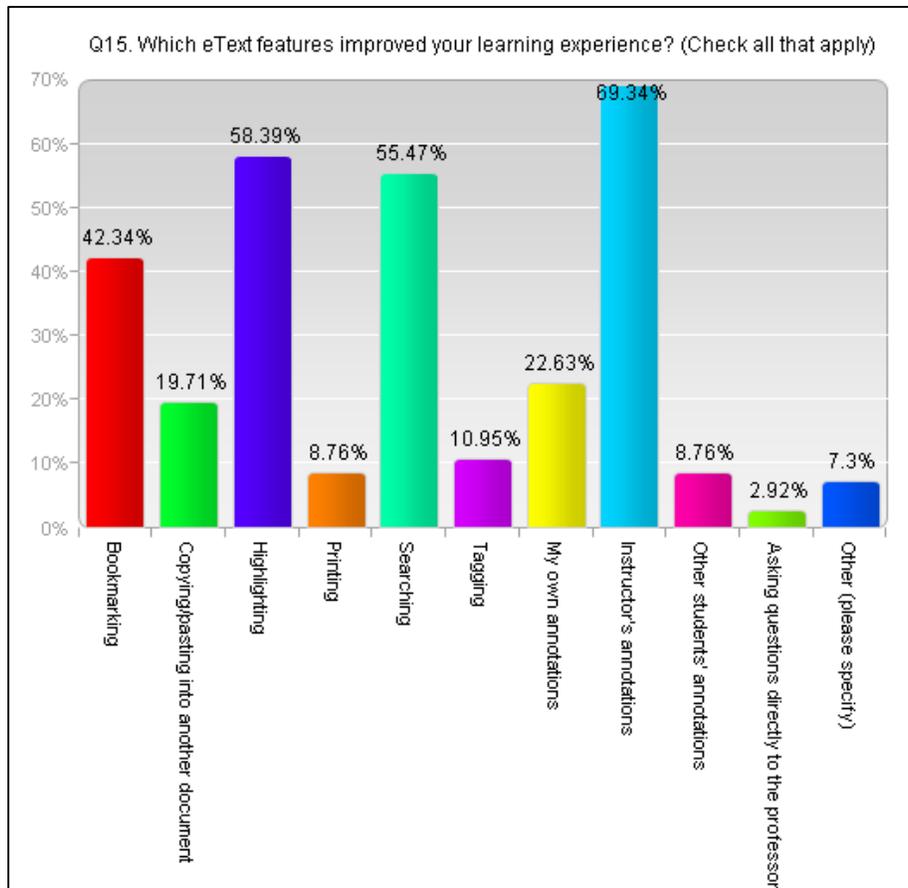
Students reported that they liked to use the search feature in Courseload to identify key concepts, and then access the corresponding section in the print book for reading. This approach correlates with a similar pattern mentioned by instructors where students would not read all assigned text, but instead just search for answers and key ideas.

Student Feedback

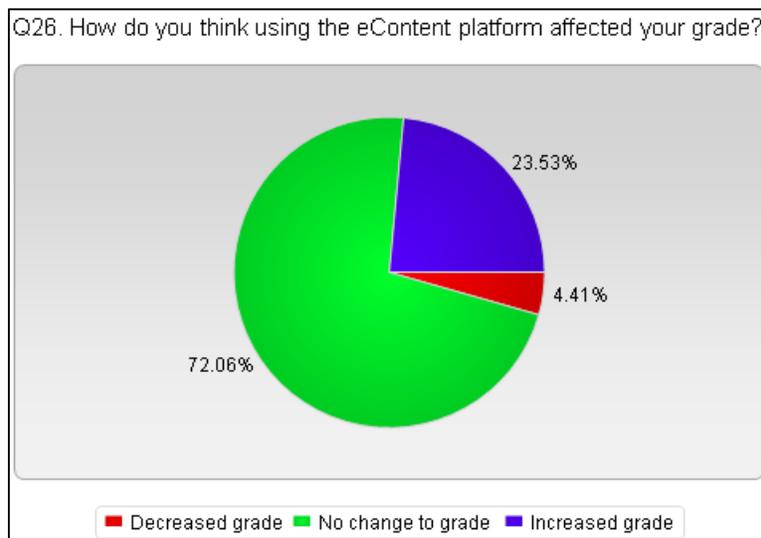
Survey responses are provided on the “Fall 2013 Pilot” webpage. The below highlights are primarily from the end-of-semester survey. 177 of the 443 student participants (40%) responded to the final survey. The questions with the lowest response rate were answered by 138 students (31%). The average response rate across all questions was 34%.

As shown below, students reported the eContent features that most improved their learning experience were instructor annotations (69%), highlighting (58%), and searching (55%). Least beneficial to their

learning experience was asking questions to the instructor through the software (3%). That sentiment was reiterated by instructors who shared that students preferred office hour visits over communicating through the eContent. Dr. Lega specifically suggested this functionality to her students and still did not receive any messages through the software.

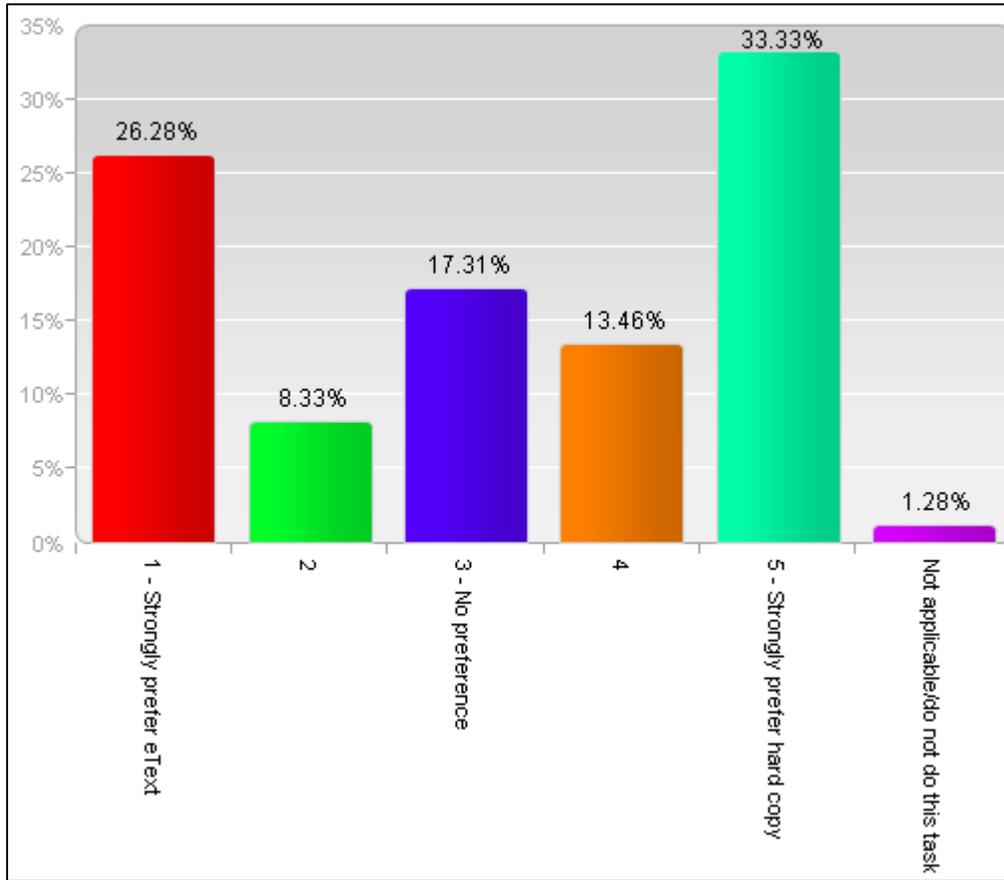


72% of students believe that using eContent did not change their grade in the pilot course and 24% think it increased their grade.

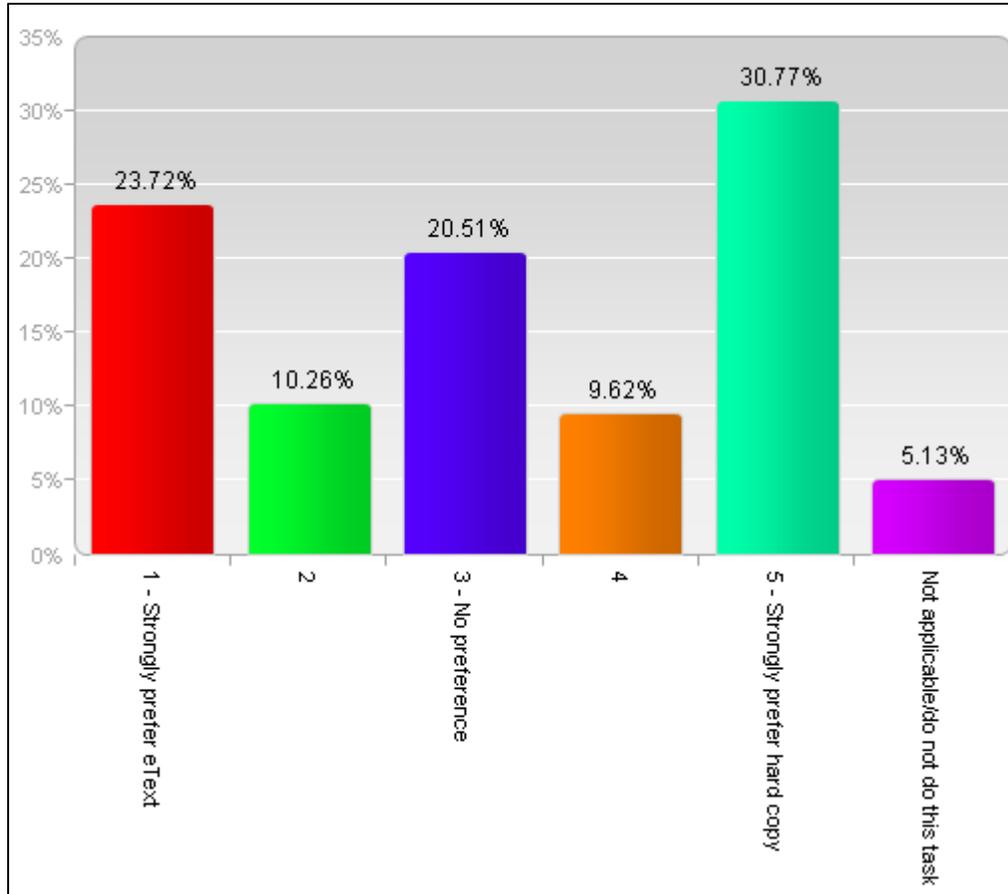


Student preference of using an eText versus a traditional textbooks for specific learning tasks was often divided. For example, 35% of respondents preferred or strongly preferred the eText for reading, while 47% had the same response in favor of a traditional textbook. 34% preferred or strongly preferred the eText for taking notes, and 41% reported the same preference for taking notes from a traditional textbook.

Do you ideally prefer to use an eText or a hard copy? – Reading:



Do you ideally prefer to use an eText or a hard copy? – Taking Notes:



Students did however report a clear preference for eText for a few tasks, such as searching for specific content (76% eText vs. 15% hard copy) and sharing notes with others (56% eText vs. 12% hard copy).

Similar to the faculty feedback, 60% of students oppose the 100% sell-thru model that requires payment for the eContent software and content whether or not a student chooses to use it.

Recommendations

Based on our research thus far, the working team makes the following recommendations:

1. Monitor the quickly evolving industry, but do not roll out on a large scale at this time.
2. Gather more information prior to running another pilot.
 - A. Learn minimum accessibility requirements for campus use
 - B. Conduct campus-wide faculty survey, including:
 - Which eContent platforms are already in use on campus?
 - Why/how were current platforms chosen?
 - How do students obtain the eContent for these courses?
 - Are faculty interested in incorporating eContent into classrooms? Why or why not?
 - Are faculty aware of existing eContent platform options?
 - Are faculty aware of available eContent functionalities?
 - Which eContent functionalities are most valuable to teaching and learning?

- C. Conduct targeted student surveys/focus groups
 - IT Student Advisory Board (ITSAB)
 - Associated Students of The University of Arizona (ASUA)
 - Graduate and Professional Student Council (GPSC)
 - College of Education students
 - D. Conduct an environmental scan of existing campus eContent tools and usage, including:
 - D2L and Blackboard data
 - Library resources
 - BookStores' current eContent offerings and sales
 - E. Establish minimum eContent platform requirements, including:
 - Meets UA Accessibility requirements
 - Provides and delivers functionalities that include:
 - Annotation, searching, highlighting, sharing
 - Works on mobile devices
 - Functionalities work offline
 - Supports open educational resources and library licensed materials
 - Supports front-end faculty upload of eContent
 - Provides accurate analytics
 - Company agrees not to contact faculty and students directly
 - F. Research feasibility and value of charging pilot students a full or partial content fee
 - Establishes precedent of paying for eContent
 - Provides opportunity to test cost model
 - G. Research existing eContent cost structures
 - Compare peer institution cost models
 - Consider purchasing lowest priced/shortest access content
 - H. Establish and communicate "fair use" guidelines to instructors for uploading eContent
 - I. Better define what "eContent" encompasses
3. Prepare for future large-scale use.
- A. Establish cost model
 - Consider faculty and student opposition to 100% sell-through model
 - Route eContent purchases through University BookStores
 - Retain ability for students to pay for materials through bursars and other special accounts for financial aid and scholarship purposes
 - Retain revenue for campus
 - Notify students of course materials before registration per Higher Education Opportunities Act (HEOA)
 - B. Software support
 - Evaluate existing staffing levels and skill sets
4. Establish guidelines for pilot faculty who continue using Courseload after pilots
- A. Content acquisition process
 - B. Payment model
 - C. IT support
5. Distribute eContent RFI
- A. Based on minimum application requirements, as described above in Section II, #5.
 - B. Identify RFI/RFP team members

Next Steps

The CIO provided additional funding to support a final recommendation on the viability of expanding the use of eContent at the UA in the near future.

We are currently running a revised Spring 2014 pilot on Courseload with 5 instructors. The eContent is strictly free-of-charge open educational resources (OER) and content provided by the University Libraries (journal articles and book chapters).

Until feedback on the above recommendations is received, the working team will continue to formulate conclusive survey and interview questions, survey and support the Spring pilot participants, update the eContent website (<http://econtent.arizona.edu>), remain informed of the econtent landscape, and talk with peer-universities to learn of their eContent models and experiences.