



UNDERSTANDING RESEARCH:

Assessing Library Impact on Academic Performance
through an Online Courseware Pilot

Middle Tennessee State University

Walker Library

Karen Dearing and Ashley Shealy

Abstract:

This executive summary will discuss the results and findings of the Understanding Research online courseware pilot study, primarily focusing on courseware design, student academic performance data, survey data and feedback from pilot participants, library instruction assessment data, and the implications of the study, both at the library and university levels.

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Introduction

Academic Reference and Instruction Librarians possess a unique perspective on student research habits and their grasp (or lack thereof) of important information literacy skills. In the instruction role, librarians provide expert guidance and encourage hands-on, active learning so that students may learn and utilize these skills; in the reference role, librarians see first-hand at the Reference Desk and other service points which questions still linger and which issues still trouble students long after the one-shot instruction session has ended. In our experience, reference desk interactions often inform or supplement the content of our instruction sessions, which in turn enable us to better answer questions at the reference desk. It is often a cyclical process, one that allows us as information professionals to see a holistic picture of the student experience with information literacy concepts and approach to college-level research.

In many cases – both in one-shot sessions and through reference desk interactions – we have observed a particular problem that is certainly not unique to our institution: students demonstrate a significant gap when it comes to moving from understanding to applying these important information literacy skills. Students may understand that they need a certain number and/or type of sources for a research project based on their professor's requirements, and may or may not have a vague idea of how and where to find these sources. However, most students ultimately struggle with the more advanced concepts and issues that arise *after* they have located these sources; evaluating information, identifying and understanding bias, incorporating source material, and citing resources are only a few of the concepts with which students struggle as they work through the research process.

Instruction librarians have very little time to make a meaningful difference in this area through just a typical one-shot library instruction session. Faculty feedback we have received (both anecdotal and quantitative) supports these observations. Many professors lament to us that by the time the point of need arises, students have forgotten what they learned in library instruction or have gone back to relying on Google for source material, despite having learned the contrary.

Statement of Problem

For us, the problem and ultimate question is: how can we as librarians bridge this widely-seen gap between the timing of library instruction and the successful application of skills outside the library classroom? Short of embedding an individual librarian in every single freshman or sophomore-level course, how can we reach all of our first-year students in a reliable, standardized, interactive, sustainable way? If we could find a way to achieve this, what effect would the library's involvement have on course performance, retention, and/or graduation rates? These are just some of the questions we sought to explore, test, and answer over the course of this project.

This research study was created and revised using several pieces of assessment data from various MTSU academic departments (Library, English, and Communication Studies), MTSU's Quality Enhancement

Plan (QEP), survey data from the University of Washington's Project Information Literacy, and a 2015 SAGE white paper.

MTSU's English and Communication Studies Departments both identified a key information literacy problem potentially affecting student success over the long term. According to the regional accrediting Tennessee Board of Regents' (TBR) Assessment Reports on learning outcomes, students completing the ENGL 1020 (Research and Argumentative Writing) and COMM 2200 (Fundamentals of Communication) courses performed poorly relating to the specific outcome "students are able to manage and coordinate basic information gathered from multiple sources." 51.7% of ENGL 1020 students scored in the "unsatisfactory" category (Smith 2014, 2) while 43% of COMM 2200 students scored in the "inadequate" and "severely inadequate" categories (Department 2015, 5). Students appear to be comfortable with finding relevant secondary sources, yet struggle with how to actually evaluate source material and incorporate it into their writing.

This identified disconnect is also apparent in our own library instruction assessment data. According to Walker Library's Faculty Feedback Survey on Library Instruction conducted at the end of Fall 2014, while "100% of [faculty] respondents indicated that library instruction had a positive impact on their students' **selection** of quality information sources for their researched assignments," 69% of English and Public Speaking faculty noted that "**integrating** information sources into the body of their writing" was still a consistent problem for students, even after a library instruction session (Vance 2015, 1).

Clearly, there is room for major improvement in terms of helping students understand and apply methods for incorporating research into their writing; however, this is a concept that is typically only briefly mentioned in one-shot library instruction classes. Professors often bring classes to the library for instruction well before the students have a fully-formed research question, let alone a general topic in mind. As such, it can be difficult for Instruction Librarians to fully meet the research needs of students who are not yet involved or invested in the research process. The same holds doubly true for first-year students who may or may not have written a research paper in high school and might therefore have little to no experience with conducting college-level research. To achieve this level of impact, some sort of asynchronous technology would have to be employed.

Exploring Potential Solutions to the Problem

To this end, we identified significant potential for the use of online information literacy (IL) modules in this and other areas of need. IL courseware modules are entirely web-based, interactive, aligned to ACRL Information Literacy standards, designed to appeal to all learning styles, and completely ADA-compliant. They reveal great potential for flipped classroom instruction, both in and outside of the library, and in actuality, are exactly the type of teaching tools 21st Century students have come to expect. A 2015 SAGE White Paper found that in a survey of 1,673 students, " ... 79% of students voluntarily watch videos to enhance their understanding of a topic, to better understand material introduced in class, [and] to understand the practical application of a theoretical concept" (Leonard 2015, 1). Alison J. Head from Project Information Literacy also notes, "Embedding modules into the research process—better help systems, short Web-based tutorials, and explanatory YouTube videos—helps students, in general, learn about research in context as the process unfolds" (2015, 32).

In our view, a technology-based, library-centered IL module project of this type would also serve to fulfill key components of our institution's QEP goals, past and present. As of Spring 2015, these modules tied

perfectly to our then-QEP, “the Quest for Student Success,” specifically aspects of Goal II, which stated “[MTSU] will enhance the academic experience of students to better ensure their success” (*Quest* 2015, 7). These modules worked to achieve the Goal II objectives of “[examining] courses across the curriculum for the inclusion of pedagogies that will enhance learning...” and “[supporting] the appropriate use of technology in creating more effective learning experiences for students, including ... the use of flipped classrooms to leverage technologies and methodologies so that teachers can spend more class time interacting with students” (*Quest* 2015, 7).

In Fall 2015, our new QEP, “MT Engage,” was approved and began to take root across campus. This QEP takes more of a self-reflection, learning portfolio approach to student learning and emphasizes the importance of academic engagement and high-impact pedagogies. In our view, an online information literacy courseware pilot would correlate perfectly with these new learning outcomes, as the modules called for self-reflection of learning and self-assessment of understanding of concepts. Online IL modules would be a great step forward in achieving some of these goals campus-wide for a number of students.

Choosing a Proposed Solution

After determining that an asynchronous, online module-based information literacy courseware program would be a viable option for assessing our identified problem, we began searching for a courseware system that could be the perfect fit for our students. As of Spring 2015, a number of major library vendors had begun to offer pre-packaged information literacy modules of this type. To get a sense of the options available, and in order to locate the ideal platform for our needs, we evaluated products from three companies: EasyBib’s Research Ready (most recently known as Imagine Easy), ProQuest’s Research Companion, and Credo’s Information Literacy courseware. All three platforms had a number of positive characteristics: they were compatible with a variety of Learning Management systems, were all 100% electronic and online, were visually attractive and easy to use, and were all centered around underlying information literacy/library research concepts.

During the time of our initial evaluation in Spring 2015, all three products were in the beginning stages and undergoing continual improvements. Both the ProQuest and EasyBib products primarily contained animations with little audio support. The content seemed geared more towards high school students rather than college students. In addition, both products lacked comprehensive ADA compliance and both lacked the ability to collect detailed student assessment data based on the ACRL Information Literacy guidelines. Although visually attractive and easy to use, we felt that the animations used (cartoons and speech bubbles) could possibly be misconstrued as too juvenile by our intended audience of freshmen and sophomore students. Since ADA compliance and grabbing our students’ attention were both paramount to us, we decided against the ProQuest and EasyBib products. It should be noted that since Spring 2015, both products made impressive changes and significant improvements.

Credo’s Information Literacy product boasted detailed analytics that could help with assessment in addition to ADA-compliant modules tied specifically to the ACRL Information Literacy guidelines. Additionally, the modules could be edited and customized according to institution-specific resources or services, a feature we realized would go a long way toward holding our students’ attention and making the courseware look and feel more relevant to their instructor’s assignments and to our university.

Ultimately, we decided to enter into a year-long research pilot using Credo's Information Literacy modules as the basis for our observations. We were pleased with the promised analytic capabilities and saw great potential for the module-based information literacy concepts included in the platform. We were also pleased with the Credo representatives and technical support staff who were extremely accommodating and responsive to our questions and needs. Our next step would be to choose an instructor to work with us in incorporating the modules into their semester curriculum.

Recruiting a Faculty Collaborator

Recruiting a willing faculty collaborator proved to be a necessary yet somewhat daunting step in the early stages of the project. Before we even began seeking a faculty partner, we created a list of potential attributes and attitudes that the ideal faculty member would need to possess. First and foremost, we needed to partner with someone who was a flexible innovator in the classroom, someone who enjoyed trying new approaches to teaching, pedagogy, and student learning, preferably via new software or forms of technology. We hoped our faculty collaborator would be as intrigued by and as interested in the module-based software as we were and would recognize the potential value of such an endeavor. From our experience, too, we knew that students would probably not elect to complete the courseware if it was presented to them as an optional exercise: credit needed to be attached as an incentive for students to participate in the courseware pilot. Our ideal faculty collaborator would need to be open to this idea, willing to make the courseware a required part of their overall curriculum, and willing to let us grade certain parts of the courseware (notably the open-ended questions).

Therefore, we needed someone who could be flexible throughout the project, would be willing to allow us to interact with their students through the courseware, and who would be open to trying something new for an entire academic year (multiple sections over Fall and Spring semesters). We also needed a faculty member who would be amenable to working closely with us for the 2015-2016 school year, as we anticipated needing to touch base with the faculty member over the course of the pilot on any number of things related to the courseware, academic performance, and any feedback we received from students, both positive and negative. We also realized that, if at all possible, we would need to find a faculty collaborator who embraced technology and did not fear the potential repercussions from students (complaints, poor course evaluations, etc.) should the courseware technology fail completely.

Finding such a faculty member initially proved to be a challenge. We brainstormed a list of potential faculty collaborators we knew through other library faculty members or through their frequent scheduling of library instruction, and then narrowed that list down to a names of faculty teaching core classes (introductory classes that would likely be made up of mostly freshmen and sophomore students). Luckily, our attention was drawn to a faculty member who was already well-known to us through his ardent use of the library and fervent support of our library instruction program. This particular faculty member, Professor Stephen Decker, fit one of our more important criteria: he exclusively taught COMM 2200: Fundamentals of Communication (students refer to this class as public speaking or speech class), one of the core classes we had already identified as a potential fit for our courseware pilot.

At the end of the Spring semester, we met with Professor Decker and gave him a full run-down of the courseware pilot study, including demonstrating both the student-facing side of the courseware modules and the backend analytics that we would utilize to assess and evaluate student work. We explained our timeframe for the study, what we planned to measure, and what we would need from

him in terms of participation. Over the course of the meeting, we learned that Professor Decker was a firm believer in the Flipped Classroom model and had actually been using that particular “flipped” method in his COMM 2200 courses for many semesters (Decker 2015, 245). We also learned that he frequently made use of online tutorials and videos in his courses, often assigning students to view a YouTube video or video supplement to the required textbook as “flipped” assignments. He embraced technology and was very open to trying new things in the classroom. As such, he enthusiastically and wholeheartedly said yes and committed to collaborating with us on the pilot project for an entire academic year. At the end of the meeting we determined how we would move forward, likely using his syllabus (which was already completed) as a guide for customizing the courseware. We also supplied Professor Decker with a unique login for the courseware modules so that he could view and evaluate the courseware content on his own time if he wished.

Designing the Courseware Pilot Project

Once we had selected a software platform and secured a willing and enthusiastic faculty collaborator, we began the phase of designing the courseware pilot project during Summer 2015. It was our goal to align the project as closely as possible with our faculty member’s course layout, syllabus, instructional content, and assignments. The first step was to dissect and evaluate Professor Decker’s syllabus, assigned textbook, and course timeline for relevant and important information literacy concepts that would match with the content of the modules we had previously evaluated. We compared the syllabus and course timeline to the textbook and other assignments to determine when in the semester the courseware modules should occur (and in what sequence) to best support student learning and point of need assistance.

After the initial syllabus mining and course evaluation, we pared down our list of Credo module offerings from 23 lessons to seven lessons, removing 16 modules that either did not relate to the course content or were deemed superfluous or simply redundant. The seven modules we selected for our pilot were:

- Academic Integrity
- Presentations
- Types of Sources
- Search Strategies
- Evaluating Information
- Extending Evaluation
- MLA Citations

We then carefully mapped the relevant courseware modules directly to the appropriate class discussions and assignments to provide point of need assistance and to provide reinforcement of the course content, noting instances where the generic content needed to be edited and tailored to fit our instructor’s specific course curriculum and our library’s specific resources. Much of our preparation and project design over the summer of 2015 focused on creating and editing this original content.

Another important step in the project design was evaluating and assessing the analytics available to us through each module and taking steps to plan how we would collect the analytics once students began the courseware. The module contents were intentionally populated with a variety of learning objects: videos, informative slides, multiple choice questions, interactive exercises that reinforced lesson material, and a few open-ended discussion questions to assess if students could apply the concepts

presented. Students would receive immediately returned scores for completed work, with the exception of the open-ended questions. We determined that we would grade those by hand using a rubric (Appendix 2). The other analytics would be collected within Credo's password-protected platform, and only we would have access to them.

At this point in the design, branding became important. After much discussion with the instructor, we determined that we should name the courseware something specific, rather than just adding the module names into the various points of the syllabus. We also did not want students to be confused and unable to differentiate our courseware from other out of class assignments that the instructor had required them to complete via the flipped classroom model. Several names were suggested, but ultimately, we bundled the seven modules together and renamed it "Understanding Research Courseware" (URC). The customized URC content was then added to the course syllabus by the instructor as required assignments, along with an explanation of the requirements, the due dates, and the grading system for the modules.

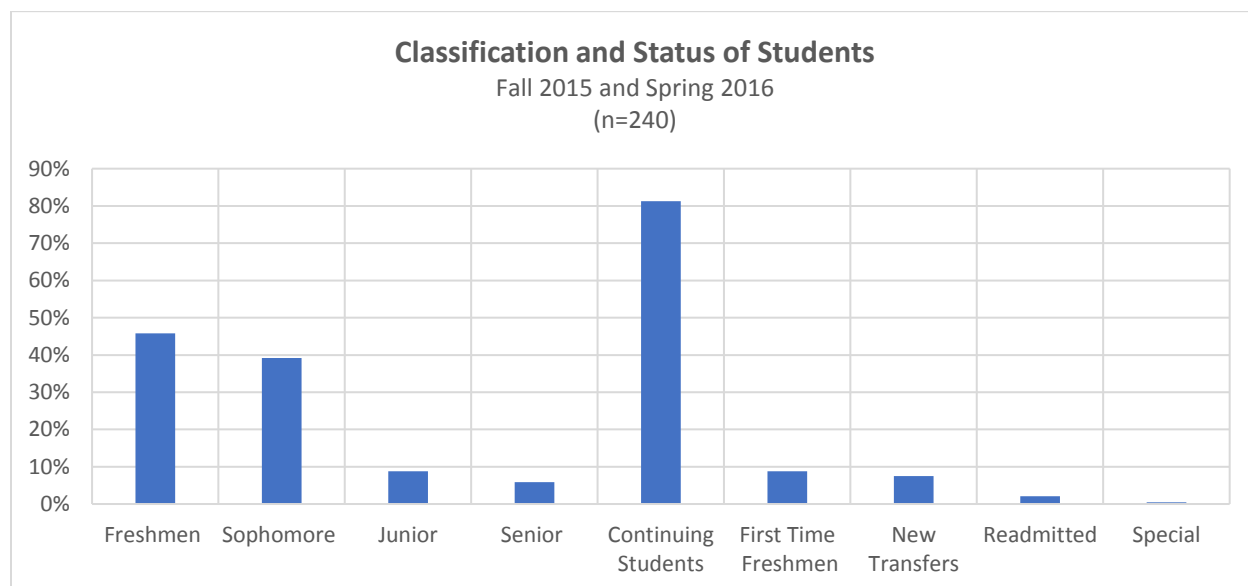
We also decided to add in a face-to-face library instruction session for all 10 classes to reinforce the online content and give students an opportunity to discuss and/or ask questions about anything related to their research needs. Fortunately our faculty collaborator was already a big proponent of library instruction and a fervent supporter of the library, so the addition of face-to-face instruction was appealing to him. In both semesters, the library session was strategically scheduled to occur before the first set of bibliographies were due for submission to the instructor. We wanted this face-to-face class to be an outgrowth and elaboration of the courseware content and not just a typical one-shot session.

As a final step in the project design process, both researchers completed the university's mandated Institutional Review Board (IRB) research training online and submitted the pilot project materials for IRB approval. This was a crucial step in the process as we would collect and have access to sensitive, identifying student information over the course of the year-long pilot study. We received IRB approval for our study in August 2015. We created an informed consent form for students to sign acknowledging their participation in the pilot study and made copies for the instructor to hand out to each student during the first week of class (well before the first module was due). The instructor also granted us access to his D2L (Desire2Learn: the Learning Management Software for MTSU) course pages so that we could input student grades for the module content, answer potential questions from students via D2L email, and post any updates and/or announcements about the courseware (due date changes, software issues, etc.).

Student Demographics

We were pleased that the students enrolled over the course of this study represented a variety of demographic categories. Our research study included 10 classes with a total of 240 students. Five classes were observed in both the Fall 2015 and Spring 2016 semesters. We were fortunate that the ten classes were taught during a wide range of times and days that allowed us to target a wider student demographic. Classes averaged 24 students and contained a variety of student classifications and status designations. Student ages ranged from 18 to 56 with an overall average of 20.64. All classes were an hour and 25 minutes in duration and were taught on either a Tuesday-Thursday or Monday-Wednesday schedule. The earliest class began at 8:00AM and the latest class ended at 7:25PM.

Classification breakdowns for all ten classes show 85% of students were freshmen and sophomores while 15% were juniors and seniors. 81% of students were classified as continuing students; the remaining 19% were a combination of new freshmen, new transfers, and newly readmitted students. Taking into consideration that the COMM 2200 public speaking course is a general education requirement for all students regardless of major, we feel our ten classes are a good representation of the overall MTSU student body.



Launching the Courseware Pilot

Location of Courseware and Method of Student Access

Participants in both Fall and Spring semesters accessed the courseware through a link posted inside their D2L course platform. D2L seemed to be the most logical jumping off point for the courseware, both for us in terms of launch and for the students in terms of access and use. The D2L access granted by our instructor enabled us to post announcements on each course section's homepage (the first page students would see upon logging into their D2L accounts). For ease of access, and so students would have a dedicated reference point for the courseware login, we posted a direct link to each section's unique courseware login page as announcement on the D2L homepage, along with some basic instructions about login, enrollment, and who to contact for help (see below).

My Home | Email | Middle Tennessee State University | Fundamentals of Communication - COMM-2200-037 | Calendar

Course Home | Content | Discussions | Classlist | Surveys | Edit Course | Log Out

News

Course and Contact Information

Comm-2200
Fundamentals of Communication
3 credits

sdecker@mtsu.edu
Stephen Decker
615-579-5653

Understanding Research Courseware
Posted Aug 24, 2015 4:41 PM

Understanding Research Courseware

Use this link to log-in and create your personal account. To make everything easier to remember, we strongly suggest that you make your username and password to match your D2L login.

<https://infolit.credoreference.com/register.html?key=eyJncm91cCI6NjQsImNvdXJzSI6Mjc2LCJ1c2VydHwZSI6MlviZXhwaXJlIjo1MjAxNS0xMjQzMSJ9#student>

After you receive your verification email use the link below to access the *Understanding Research Courseware* and complete the assignments listed on your syllabus. This link is specific to your section of COMM2200. Please do not share this link with students outside of this course or attempt to Google the courseware and log-in from the company website.

<https://infolit.credoreference.com/lms/courses/276-mtsu-comm2200,-sec-037.html>

If you encounter any problems using the Understanding Research Courseware, please contact one of your course librarians: Karen Dearing [karen.dearing@mtsu.edu] or Ashley Shealy [ashley.shealy@mtsu.edu]

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Important Resources

- ITD Help Desk: 615-898-5345
- MTSU's D2L Support: [Click here!](#)
- Distance Learning Student Services: [Click here!](#)
- James E. Walker Library: [Click here!](#)
- Disability and Access Center: 615-898-2783

Publisher Resources

At the request of faculty, Middle Tennessee State University is providing integrated access to:

McGraw-Hill Resources

Faculty - whether or not they use a McGraw-Hill title - can instantly browse, search and access the entire library of McGraw-Hill instructional resources and services including eBooks, test banks, PowerPoint slides, animations and learning objects.

Course Administration

Site Setup
Course Offering Information

Detailed instructions on how to access the courseware, including the same login information listed on the D2L announcement page, were also included on the course syllabus. A hard copy of the syllabus was handed out on the first day of class, and an electronic copy resided within D2L for the entirety of the semester. Additionally, we prepared some detailed talking points for the instructor to cover on the first day of class when explaining/introducing the courseware to students in case they had questions or concerns.

Fall 2015 Launch Experiences

Student Access & Enrollment: Overall during the Fall semester, students did not seem to have much trouble finding the courseware login link via D2L. We had few complaints or reports of trouble with access and the enrollment numbers within the courseware platform seemed to validate this. However, though our enrollment numbers were high, our initial participation rates were quite low compared to what they should have been, especially since the courseware was a required component of the class. A few weeks into the semester, we mentioned this to our instructor. He then firmly reiterated the importance of the courseware to students during the next class session, and participation skyrocketed.

Platform: The Fall 2015 courseware platform did not allow us the capability to make edits to the content ourselves. Prior to the official launch when the semester began, we created original customized content and edited some of Credo's existing content by submitting our changes and edits to Credo support via email request. Credo then made the changes for us, making editing a two-step process. We were dismayed by this rather cumbersome aspect of the courseware; however, we were very pleased that we did have full and complete control over the robust analytical features also included in the courseware.

Courseware Completion & Deadlines: Fall semester presented several problems with students not completing the courseware by the assigned deadlines, which we anticipated might occur. Unfortunately, try as we might to design and deliver the courseware in such a way as to apply to point of need for students, the platform design of the courseware itself could not prevent students from working ahead or behind the syllabus due dates. This design flaw interfered with our ability to provide online

instruction through the courseware modules at a specific point of need during the semester. Many students simply completed the courseware in one fell swoop rather than module-by-module as we planned. Other students skipped around within the modules, completing bits and pieces of sections both before and after they were due. We made a note of this and kept it in mind as something to address proactively in the Spring.

Grading the Modules: Grading the courseware modules throughout the Fall semester proved tricky and time-consuming for a myriad of reasons. For one, there were some problems with students not actually completing the modules in their entirety but still receiving “full credit” via the courseware gradebook. Examples of this include: students who skipped through the modules at a rapid pace, fast-forwarding through the materials and videos (recorded timestamps confirmed this); students who guessed at the multiple choice questions and/or attempted the multiple choice questions repeatedly (despite the courseware instructions explicitly warning against this); certain students realizing that they could “game” the system by entering nonsense into the open-ended question response fields; students who skipped the open-ended questions entirely, apparently believing them to be optional. Unfortunately, to our frustration, there was nothing in the software design that prevented this behavior or stopped any attempts by students to game the system. Students who attempted any parts of the modules, whether honestly or not, received “full credit” from the system and continued to progress through the modules. More detailed observations and experiences are addressed in subsequent sections of this report.

Spring 2016 Launch Experiences

Student Access & Enrollment/Login Issues: The instructions for login via the D2L announcement page (and via Professor Decker’s syllabus) were kept exactly the same for Spring 2016. However, due to a platform upgrade by Credo, the login screen for the courseware was redesigned, causing a variety of issues with enrollment and login. The most consistent problem we faced was students attempting to create multiple accounts within the courseware using the same email address: essentially, students would create an initial account using an email address and would receive a confirmation via email sent to that account. Perhaps due to not carefully reading the login instructions or simply forgetting their chosen passwords between login attempts, students would go back to the login screen the next time they wanted to access the courseware and instead of simply logging in again, would re-create their account using the very same email address, rendering both their old login and their “new” login useless. We estimate that this happened to over 20 students.

Additionally, further technical issues related to courseware access arose within the first week of classes. Despite being instructed to enter the courseware through the course section-specific, direct link in D2L, a number of students did not follow these directions and attempted to take a shortcut by simply Googling the courseware entrance page. Unfortunately, and perhaps due to the platform changes, a Google search *did* provide a link for the old MTSU/Credo URC software, linking back to the old courseware contents from Fall 2015. Students who stumbled upon the old link used it to enter the Fall 2015 courseware platform and became lost when the contents and due dates did not match the current syllabus. We estimate this happened with over 50 students. We reported this issue to Credo support, who immediately found and hid the old link, thus revoking student access to the old courseware. However, hiding the link and revoking access caused the students who had not followed our directions to complain that they could no longer access the courseware material. This technical glitch and inability

to follow directions created a web of access, enrollment, and other technical problems that we spent days untangling.

Platform: As mentioned, Credo completely redesigned the courseware platform between Fall 2015 and Spring 2016, with updates made to the software and to the course content itself. We learned of these changes in January 2016, only a few weeks prior to the start of Spring semester. On one hand, the redesign was beneficial as it allowed us to make our own edits to the courseware content and to insert our own materials. On the other, however, the previous robust analytical functions were significantly reduced, and therefore the platform now lacked much of the intuitive design that had previously allowed us to retrieve the meaningful data that we wanted. The platform redesign made it impossible to replicate the content presented in Fall 2015 and also made it impossible to administer the IRB-approved survey that was previously used to collect student feedback. In place of the survey, we collected a random sample of 46 persuasive speeches from students (complete with supporting bibliographies), and evaluated the quality of the bibliographic content in order to assess if students actually used and/or applied the concepts presented in the courseware modules. Results from that evaluation are reported in a later section.

Course Completion & Deadlines: Based on our experience from the previous semester, we knew that there would likely be problems with students not completing their work during the assigned times. To combat the problem of students working ahead or becoming too overwhelmed by the possibility of having to complete multiple modules at once, we enabled a new, optional Adaptive Release feature of the courseware, which would effectively “hide” each successive module until we opened it up to the students for completion. Our thinking was that this Adaptive Release would prevent students from working ahead and would allow the flipped classroom model to be implemented with greater effect. Unfortunately, the Adaptive Release only caused more problems with access and enabled students to claim that they had attempted to complete the courseware in time, but could not access it. Timestamps and other analytic data showed some of these claims to be truthful; others could not be substantiated or verified. After fielding multiple complaints and issues regarding the Adaptive Release feature, we finally relented and opened up all the modules, even extending some of the deadlines.

Observations of Student Behaviors and Results within the Courseware

Assessing and analyzing student work within the courseware over Fall and Spring semesters allowed us to gather a plethora of interesting, eye-opening data about students’ academic behavior.

For instance, despite the courseware being assigned as a required component of the course and as a part of the overall course grade (10 homework points awarded for each module successfully completed), many students across sections in both semesters chose either not to complete the courseware or not to participate at all. Some students determined that they could still pass the class without receiving all of the points allocated for the courseware, and as such, decided to complete only a few modules. Many students did not even bother to create an account or log into the courseware at all, while others decided that the courseware was busywork or was perhaps too repetitive of concepts they had “already learned.” Examples of these varying attitudes were reflected in the student survey responses (Appendix 2):

- “I learned all of this in high school.”
- “[The courseware] was more of a task than helpful.”

- “It was redundant.”
- “Make it voluntary, instead of making it an assignment for students.”
- “I was too eacy [sic] to just blow through it without comprehension.”
- “The information was stuff I previously knew [sic] and did not need the review.”
- “I found it as a waste of time.”

Unfortunately, the grade data we collected did not necessarily support or reflect the assertion that all of the information presented in the modules had been learned or absorbed previously.

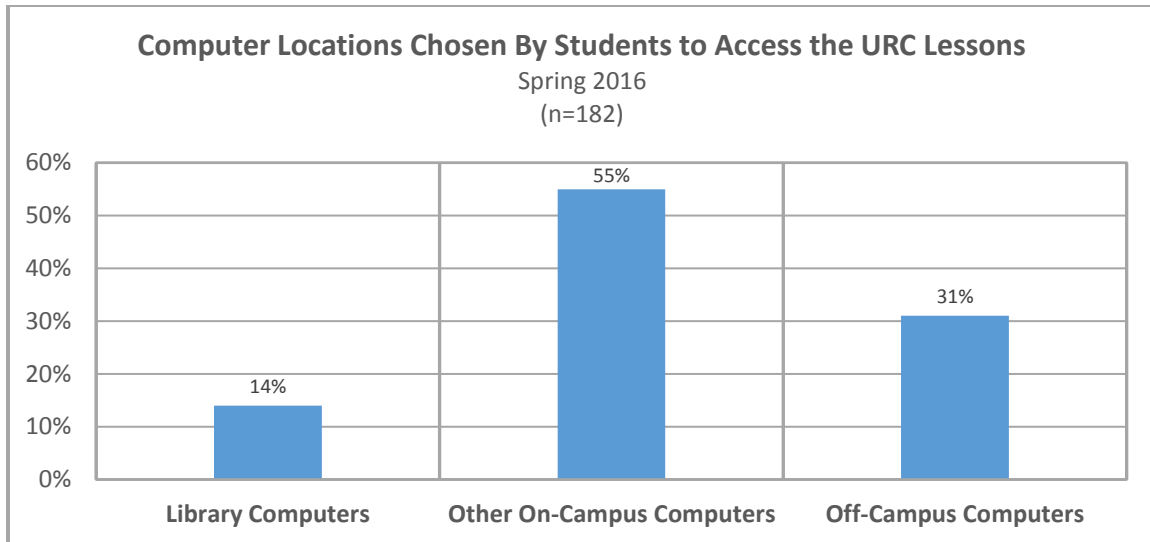
Many students were also unable and/or perhaps unwilling to follow directions when it came to logging in, creating accounts, and completing the URC. Students in both semesters struggled greatly with hitting the deadlines for completing the courseware modules, which were listed in their syllabus and within the courseware itself. Some students also appeared to struggle with simply navigating the courseware modules, almost not seeing or paying attention to the directions on the screen directly in front of them. The instructor and the librarians received multiple emails decrying the courseware as “unfair” and/or complaints of issues that had been previously resolved or addressed early on in the semester by proactive communication from either the instructor or the librarians.

Interestingly, we also observed that students seemed to be generally unaware of (or perhaps were ambivalent about) the fact that their work could be seen by both the instructor and the librarians. We are not really sure what caused this phenomenon, but it was something we both observed across sections in both semesters. Perhaps the students assumed that there would be little to no communication between the librarians and their instructor, or that their instructor would not care how they behaved or performed within the courseware. Examples of this include students either cheating on or skipping the academic integrity module, students entering nonsense or incomplete answers into the open-ended question responses while still expecting full credit, and a handful of students trying to claim that they had done their work, but it hadn’t been saved, even though the courseware timestamps and recorded logins proved otherwise. Bear in mind that the students performed this way knowing full well that their work (or lack thereof) was directly associated with an identifiable account they had created.

The improved Spring 2016 analytics also gave us the advanced capability to collect data about other student behaviors pertaining to the courseware. Each of the following observations presented a few surprises.

Locations of Computers Chosen for Accessing URC

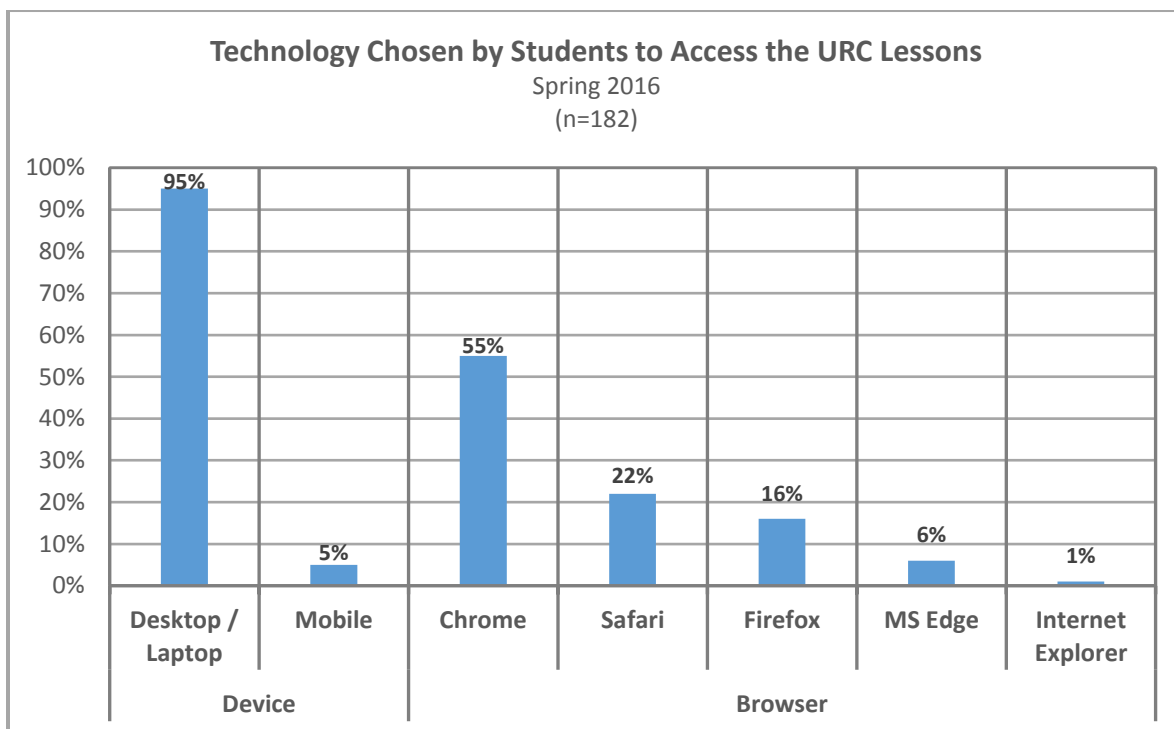
In learning about our students’ online behaviors and technology preferences, we were curious to know where (on or off campus) students opted to complete the URC. The graph below shows where the courseware was accessed and illustrates student preferences in terms of computer locations. 55% of students overwhelmingly used on-campus computers to complete the URC assignments. Off-campus access accounted for 31% of the logins and library computers ranked third place with 15% of the total logins.



Technology Chosen to Access URC

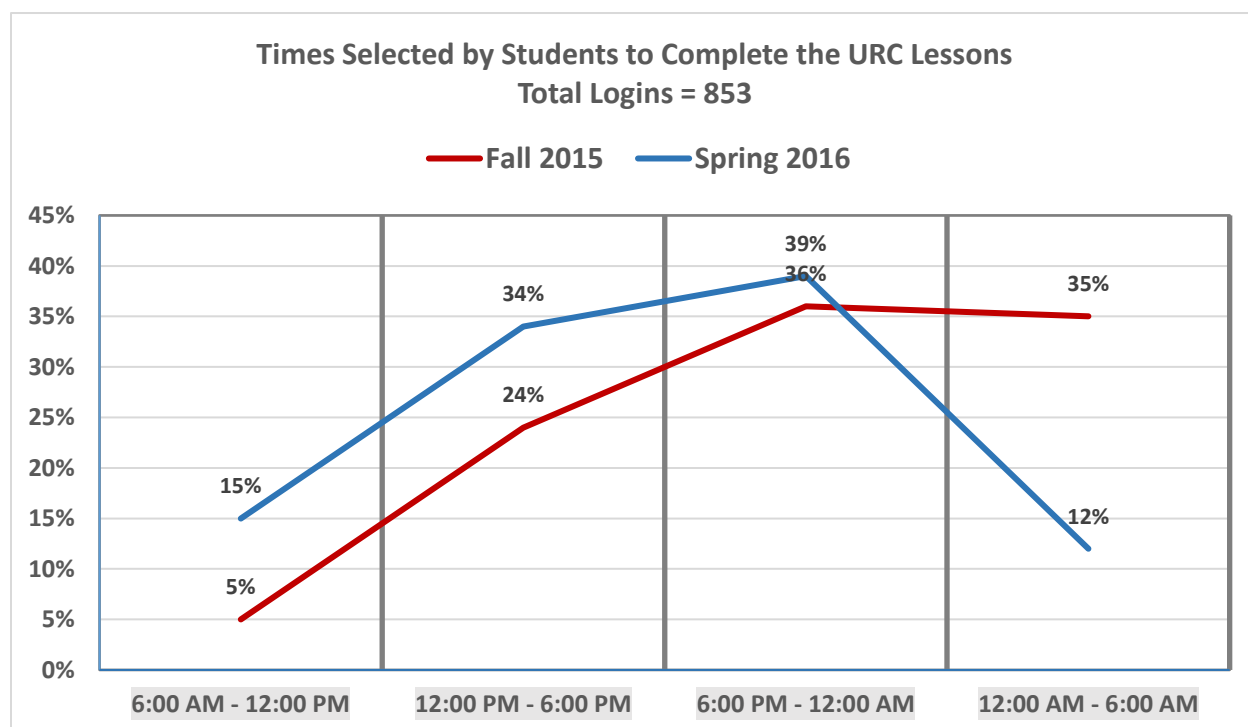
We were surprised to see 95% of students selected either a desktop or laptop to access the courseware. We had assumed there would be a strong showing for mobile device usage but only 5% of the logins came from tablets or smartphones.

Chrome, with a 55% usage rate, was overwhelmingly the number one preferred browser. Safari, with a 22% usage rate, was the surprisingly strong second place preference.



Times Chosen to Access URC

This particular observation was the most surprising to us. Perhaps predictably, most students during in Fall and Spring semesters preferred to complete the courseware between 6PM and midnight. The second-most utilized time range for completion during the Fall 2015 semester occurred between midnight and 6AM, with 35% of student logins falling during these times. That figure was just one percentage short of tying the 36% majority for the 6PM to midnight category. During the Spring semester, the midnight to 6AM time frame dropped to dead last in terms of time ranges chosen for access. Instead, the noon to 6PM range interestingly became the second-most utilized time category. We have several theories about this change in study habits: perhaps lower grades in the Fall semester motivated students to stop completing homework after midnight and to instead rest or sleep? Or maybe the Spring semester allowed for less time spent on activities, meetings, and/or social events, and instead freed up more time for completing homework assignments? Though we were curious as to the causes, we were unable to accurately measure these variables.

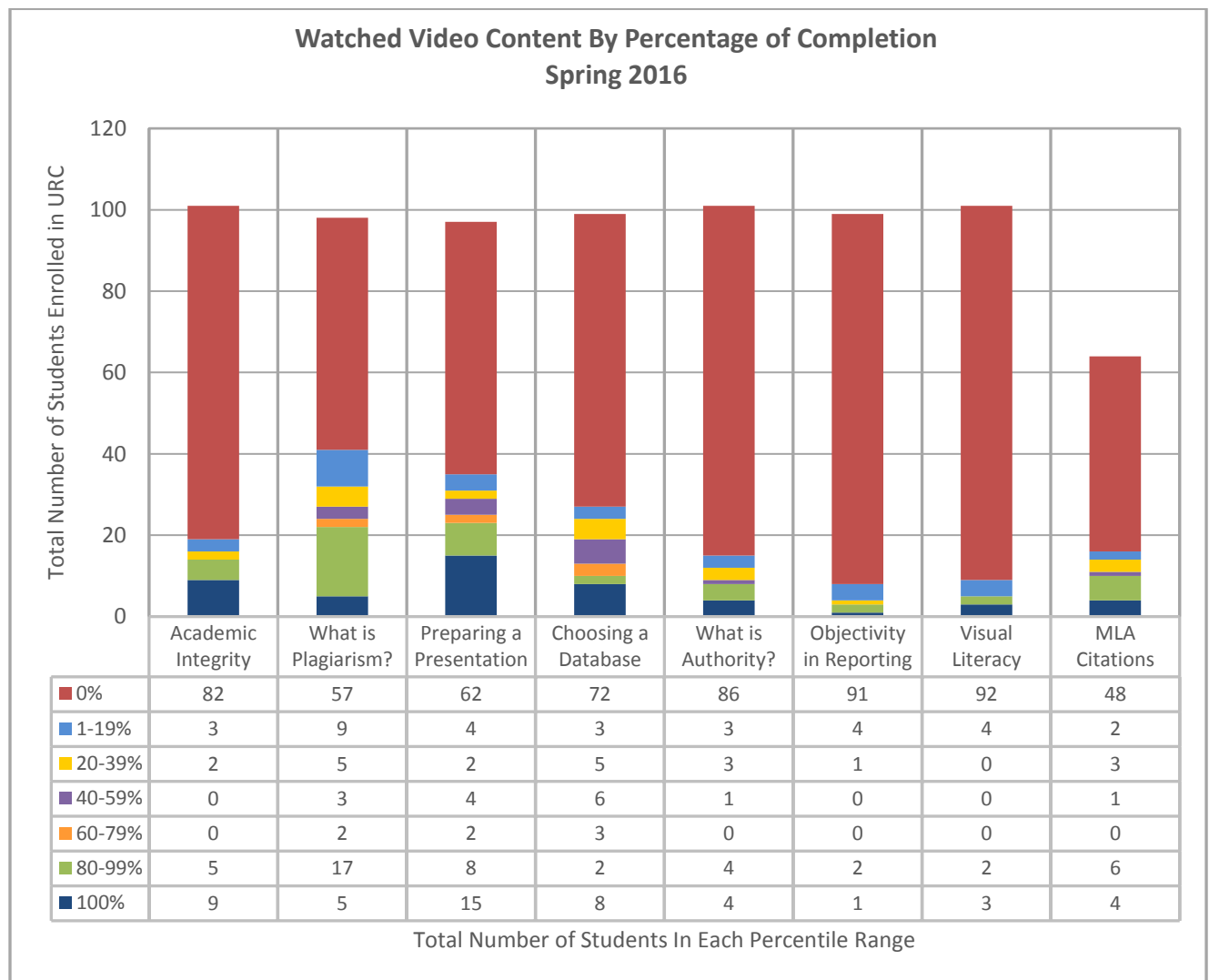


Video Viewing Habits

The updated Spring 2016 analytics also contained enhanced video viewer capabilities that would capture the number and duration of views for each video in the URC. In the previous semester, we had no way of accurately knowing if students watched the video contents; instead, the analytics simply collected the number of times the video was opened and thus counted an opening click as a complete view. The detailed data from the new video viewer analytics was extremely helpful in allowing us to capture which students opened the tutorial videos and how much of the opened video was actually watched. Unfortunately, the numbers of videos viewed were extremely disappointing. The video tutorials in the URC were good quality, averaged only three to four minutes, and were in fact selected for inclusion in part due to their brevity. Additionally, many of these videos contained information that

was directly referenced in the quiz/open-ended question portions of the modules, yet many students chose to skip or only view small sections of the videos. We believe this lack of effort had a negative effect on overall performance in the courseware modules.

The graph below paints a very accurate picture of student viewing habits, while also illustrating just how overconfident students are in their own understanding of a concept. In the case of the students in our sections, this overconfidence led them to skip tutorials entirely or just open and promptly close them in an attempt to receive unearned homework credit. The four tutorials that were least viewed covered authority, objectivity, visual literacy, and academic integrity. In a twist of irony, the subjects covered in those four tutorials repeatedly gave students the most difficulty throughout the courseware and were especially difficult for students to apply in the open-ended questions. Sadly, the inability to apply these same concepts was also very evident in the quality of the student speech bibliographies we evaluated later in the pilot study.



Observations Concerning Student Attempts to Gain Unearned Credit

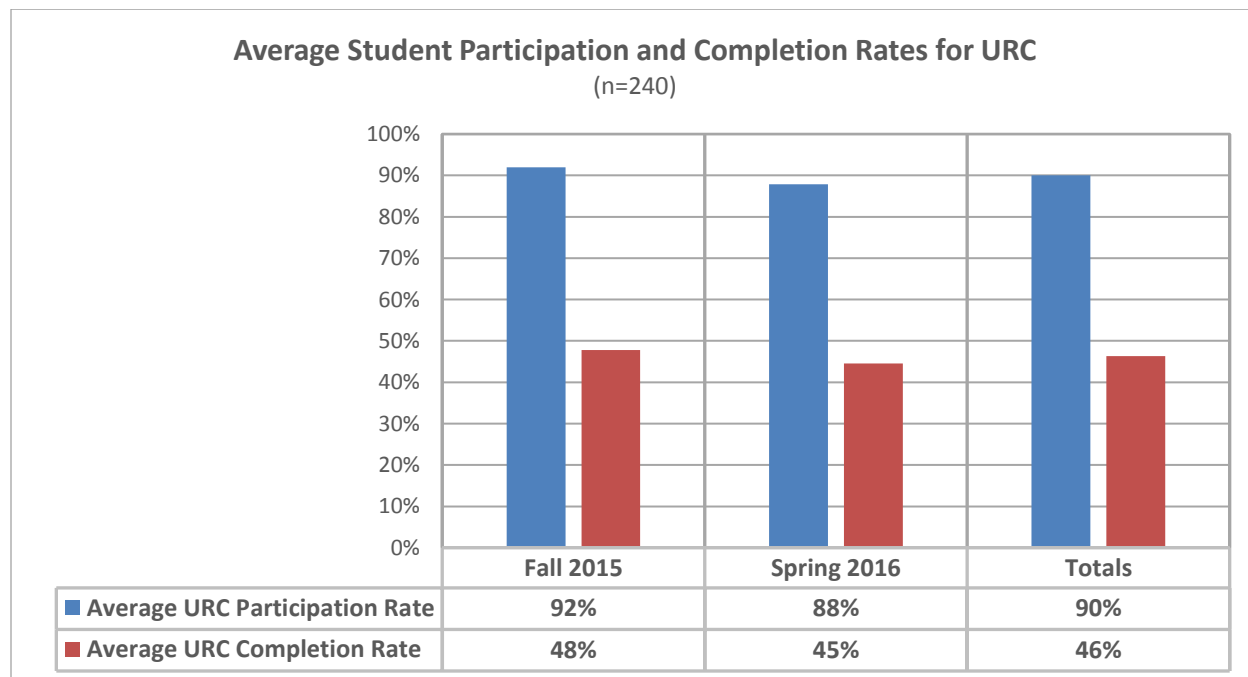
Timestamps were extremely useful for tracking student behavior and performance in the URC. Timestamps allowed us to see when accounts were created, when students logged into the courseware, and how long students spent within the modules while completing the material, quizzes, and open-ended questions. The timestamps showed multiple and repeated attempts to beat the software design in order to earn credit for work not completed. We were dumbfounded that many students spent more time trying to beat the software design than it would have taken to complete the materials: after all, the courseware had been designed with brevity in mind. We wanted the quality of the module material to outweigh the quantity of it.

To our dismay, it seemed as if there was an aversion to earning credit by completing the modules, or as if the students truly did not see the courseware as a required portion of their coursework. Over each semester, it became clear to us that we were dealing with students who possessed a different value system concerning information ethics and earned grades and perhaps different views on the use of technology in an educational context than we thought previously.

Observations of Student Performance and Results within the Courseware

Participation and Completion Rates

The URC had an excellent participation rate for both Fall 2015 and Spring 2016. Out of 240 students, 90% created URC accounts and attempted to complete at least some of the assignments. However, the URC overall completion rate was very low. "Completion" was defined as finishing all components of the assigned lessons. Over the course of our study, students struggled with completing all of the lessons for various reasons, and in the end only 46% of students managed to complete all of the assigned lessons despite the instructor's mandatory requirement.



Student Academic Performance within the Courseware and Overall Grades

During the Spring 2016 semester, improved analytical capabilities and access to student speeches and bibliographies allowed us to measure the impact of the courseware on the quality of student research and resulting bibliographies. A random sample of 46 persuasive speech bibliographies was taken from the five participating classes and then scored using a rubric scale of zero to five (low to high) designed to measure the quality of the selected sources and the accuracy of the formatting for the purpose of locating the resources used (Appendix 1). All bibliographic entries were given individual scores that were averaged together to create one comprehensive score for each of the individual bibliographies.

We then asked our faculty collaborator to provide us with a baseline comparison speech and bibliography that exemplified the majority of submissions typically received prior to Fall 2015. Speech bibliographies are required to have a minimum of six resources and students are allowed to use free web resources, library subscription resources, or a combination of both. Our instructor selected a baseline speech and bibliography on the topic of abortion that contained only freely-available web resources.

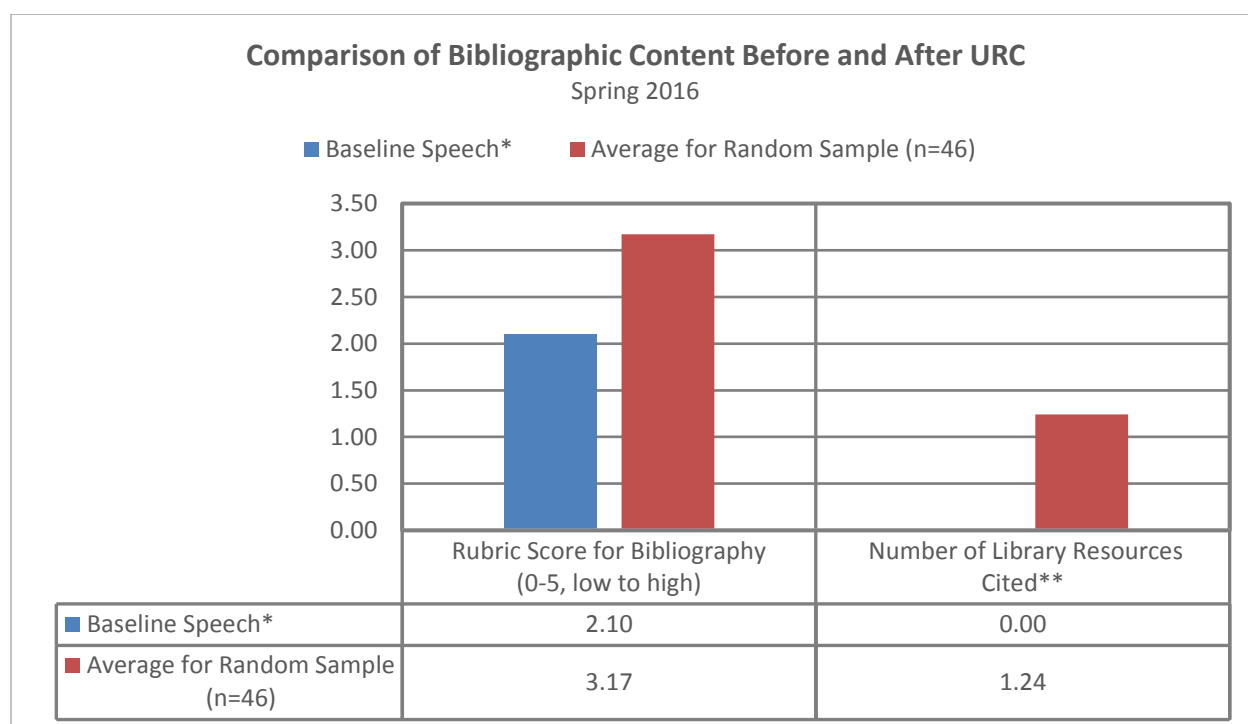
We were disappointed to see that our baseline bibliography contained only free, web-based resources and no library subscription resources. For years, our instructor had been bringing his students every semester for one-shot library instruction sessions. During these sessions, both the instructor and the librarians encouraged students to use library resources and then demonstrated the best library databases and websites for credible information on persuasive speech topics. At the end of each session, time was allotted to work one-on-one with students and additional help and contact information was provided for students to use after the classes ended. It was disheartening to learn that our past instruction efforts were essentially ineffective in terms of persuading students to use library subscription resources.

In addition to the disappointing lack of library resources, the baseline bibliography contained a selection of resources that were biased and unbalanced with little to no authority or credibility, and the formatting was so poor that we had difficulty locating all of the resources. Our instructor was comfortable and confident that this baseline speech and bibliography represented the majority of what he received on a regular basis. In addition, a 2015 internal assessment report for student academic performance within the COMM 2200 classes also supported Professor Decker's selection. The report revealed that 43% of a random sample of COMM 2200 students scored in the inadequate or severely deficient categories for managing and coordinating basic information gathered from multiple sources while (Department 2015, 5).

Our four bibliography assessment goals were to determine if (1) students using the URC produced better quality bibliographies; (2) the URC positively influenced students to include library subscription resources in their bibliographies; (3) students electing to use library subscription resources had a higher rubric quality score than students who only used free web resources; (4) students using library resources performed better academically in the COMM 2200 course than students who only used free web resources.

Bibliography Assessment Goals #1 and #2

Our performance data indicates a positive correlation between URC usage and increases for both bibliography quality scores and number of library resources used when compared to the baseline bibliography. On the rubric's zero to five scale (low to high), the quality of the bibliography contents increased from 2.10 to 3.17 representing an 18% improvement. The number of library subscription resources increased from zero to 1.24 representing a 21% increase using a minimum scale of six. Because the average number of library resources started at zero, the URC influence could not be negative: only a positive increase or a neutral equivalent of zero was possible. Although the increase in the number of library resources used is small, we consider the small positive change to be a step forward in the willingness of students to change their research habits.

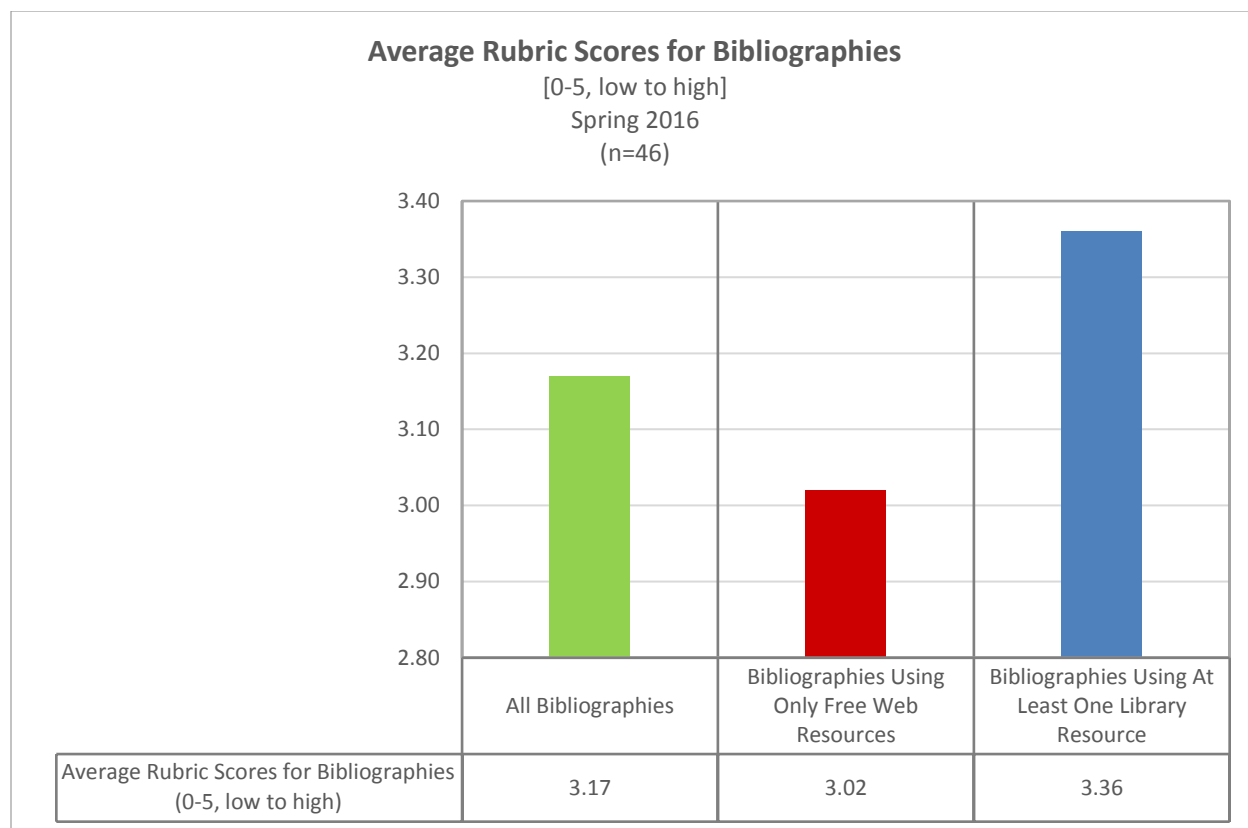


*Instructor provided a baseline speech and bibliography that best exemplified the majority of student submissions received prior to Fall 2015.

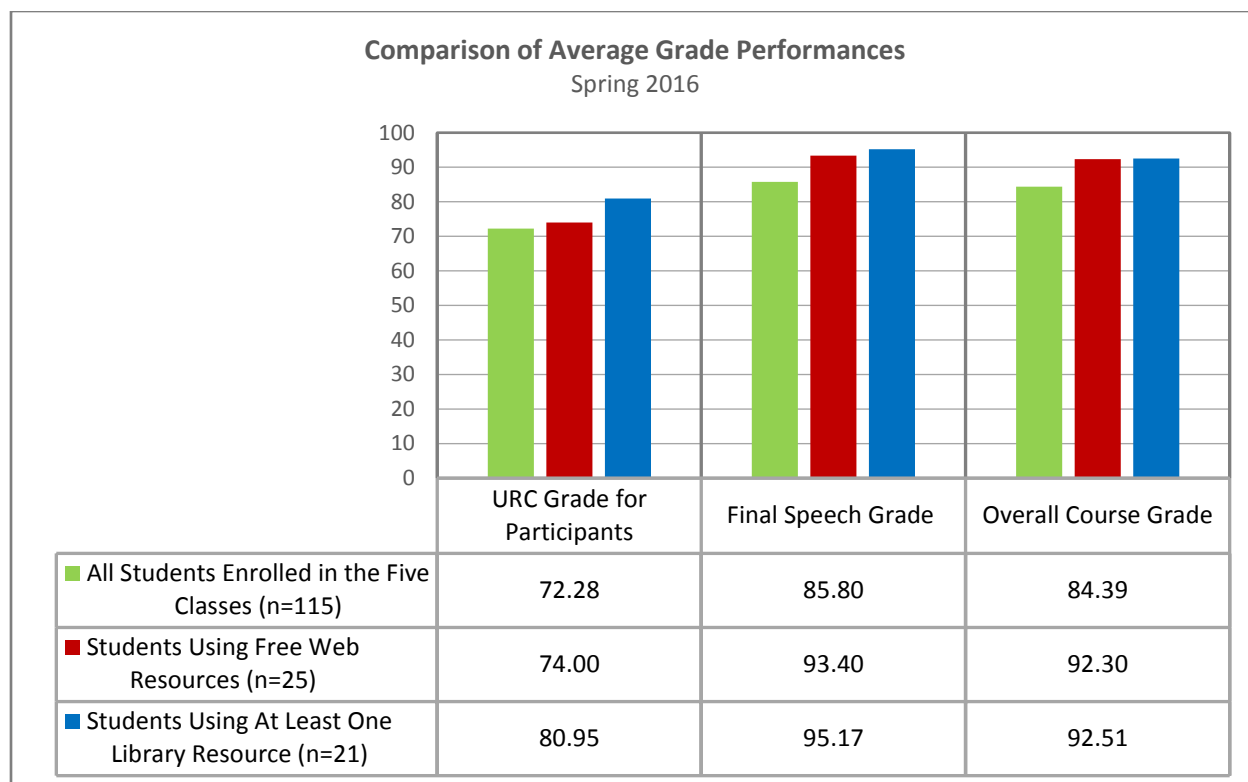
**A minimum of six bibliographic resources was required. The use of library resources was not required, but was encouraged by the instructor and the librarians. Despite this encouragement, the average student bibliography submitted to the instructor prior to Fall 2015 did not include any library resources.

Bibliography Assessment Goals #3 and #4

A direct comparison of the average rubric scores showed students who elected to include at least one library resource in their bibliographies had a slightly higher quality score than both the overall average and the average for students only using free web sources. Students using at least one library resource scored 4% higher than the average for all bibliographies and 7% higher than students using only free web resources.

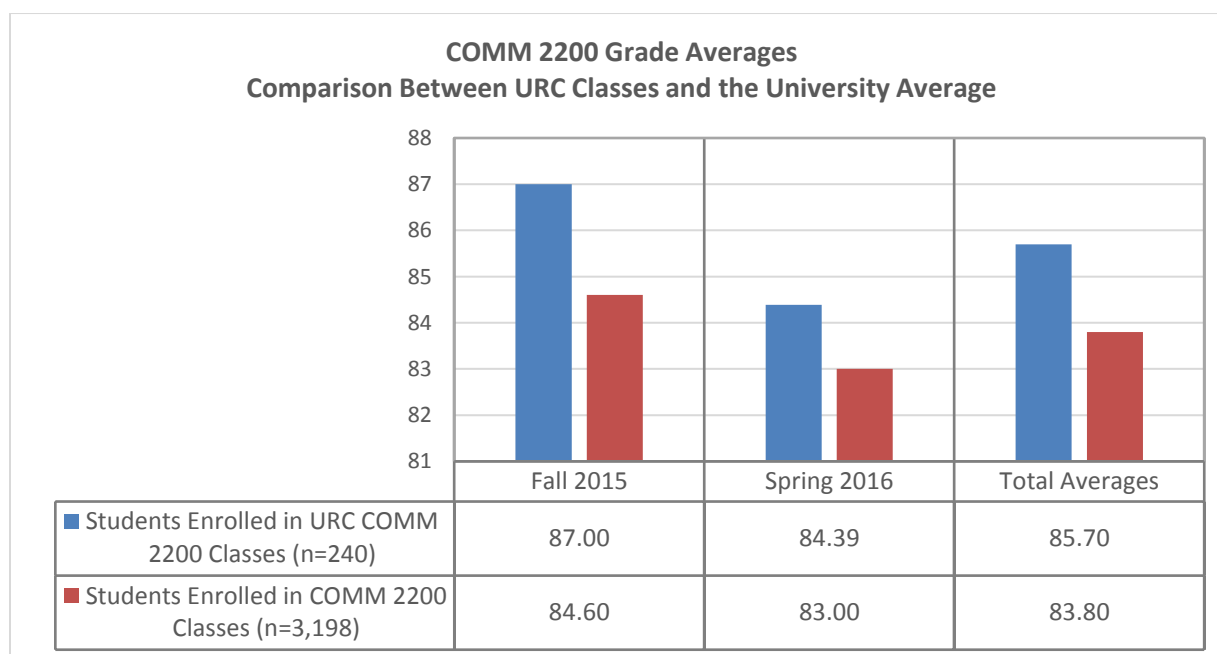


In addition to the higher rubric scores, students using at least one library resource also performed better academically in COMM 2200 than their fellow classmates. Library resource users scored on average 9% higher in URC grades, final speech grades, and overall course grades. For students enrolled in COMM 2200, a 9% improvement is equivalent to an increase in one letter grade. We hope our research results show that if students make the effort to use library resources, then it can truly make a positive difference with their grades and in the overall quality of their work.



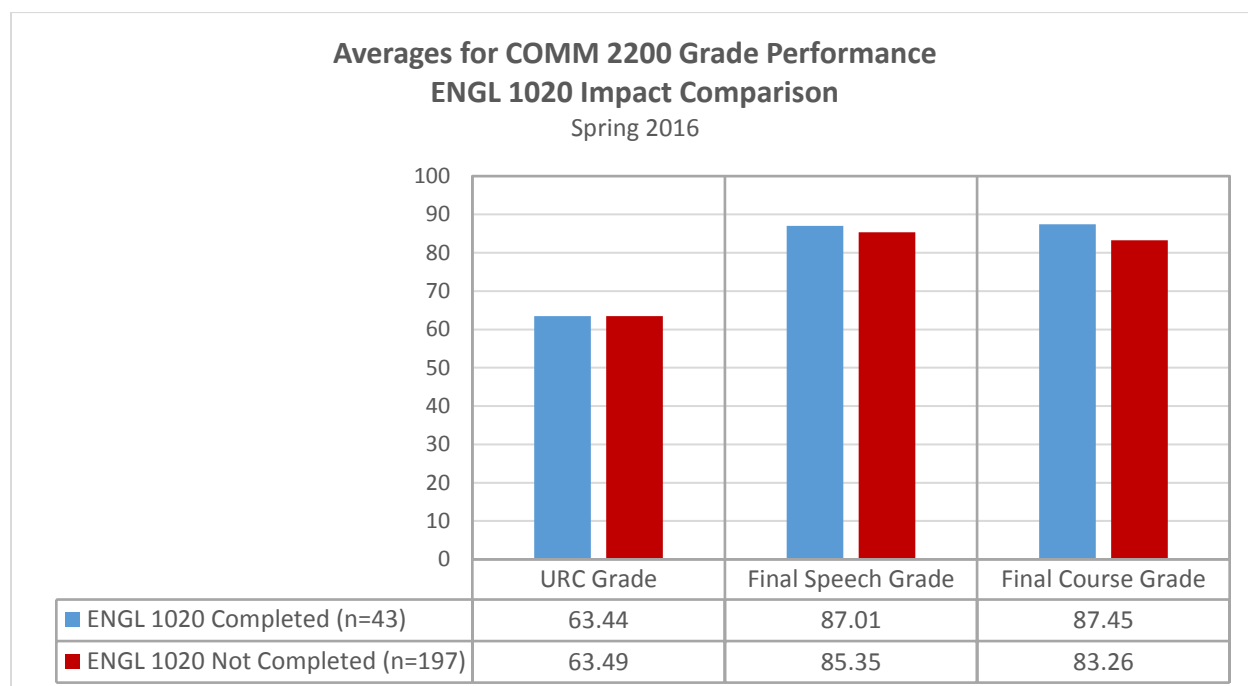
Comparison Rates

The ten classes participating in the URC study performed slightly better academically in comparison to the university average for all COMM 2200 courses. The final COMM 2200 course grade average for URC students was 85.70 while the university average was 83.80. The university average was obtained from 123 sections totaling 3,198 students.



Impacts of ENGL 1020 Completion

Our performance data shows that students who completed the English 1020 composition course (Research & Argumentative Writing) before taking the COMM 2200 public speaking course had better overall grades and submitted better research bibliographies. On average, COMM 2200 students who previously completed ENGL 1020 scored 4% higher in both bibliography quality and final course grades when compared to their classmates who had not completed ENGL 1020. Unfortunately, 82% of the 240 students enrolled in our research study elected to take COMM 2200 before completing the ENGL 1020 course. We believe this is an important consideration in terms of academic advising and curriculum emphasis. In addition, this could be a contributing factor to the poor student research performance both observed and obtained in this study.



Overall Impact/Value of the Project

Student Survey Feedback

To evaluate student thoughts and feelings concerning online courseware, we created a ten question survey with optional open comments. The survey was designed to be anonymous and was administered by the instructor to all five classes during Fall 2015 (Appendix 2). 96 students participated in the survey. Overall, the responses were positive. A few important survey results showed:

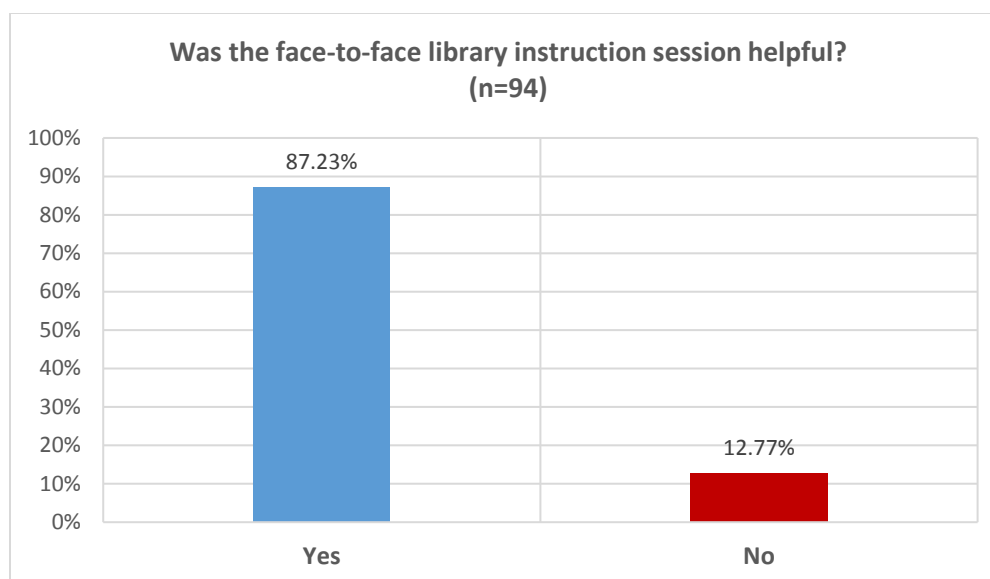
- 79% of students considered the URC helpful for completing their assignments. The most helpful lessons identified by students were MLA Citations, Presentations, Search Strategies, and Evaluating Information.
- 95% of students said the lessons were easy to understand and complete.
- 80% liked the content mixture of learning and assessment options.
- 92% felt the lessons adequately covered the material in a manageable time frame.

- 82% liked the independent learning design that allowed them to complete the lessons at their own pace and on their own time.

When asked if anything should be added or deleted from the courseware content, 73% said no; they liked the content that was provided. However, common responses in the open comments indicated that several students did not like the short answer application questions. They preferred simple multiple choice questions and did not want to spend any extra time practicing the application of the learning concepts.

There were a few survey questions that produced surprising results. When we asked students if the URC presented any new detailed information, 52% said no. Most students felt confident that they already knew the information presented in the URC and considered it to be a refresher. However the majority of student performance results showed exactly the opposite. Students did not make the distinction between the ability to regurgitate information and the ability to critically apply information. Students wanted to stay in their already familiar comfort zones that allowed them to guess at multiple choice questions in order to plow through materials and finish at fast rates. The student comments, behavior observations, and performance results all revealed a common thread; students struggle with the intrinsic motivation necessary for acquiring higher level critical thinking skills. One unedited student comment summed up this struggle: "I was done lerned [sic] this before! I just bull crapped my way thru [sic] and it wasted time out side of class in stead [sic] of WHAT I PAY YOU FOR!!!"

The last survey result was actually a pleasant surprise. When we asked students if they found the face-to-face library instruction session helpful, 87% said yes. Although the design of our study did not allow a separate impact measurement for the face-to-face instruction session, we were grateful and relieved that so many students felt the session was a good use of their time. However, we were a bit perplexed considering our bibliography analysis showed so few students actually included library resources in their research. There were 18 comments expressing how much students enjoyed and actually preferred the face-to-face session over the online courseware, while others expressed appreciation for the personal attention given to them at the end of class. We would like to end the study results with one of the most uplifting student comments: "Awesome help! Awesome Librarians! They gave good insight on how to find good topics and research."



Recommendations/Future Directions Based on Findings and Observations

In summation, it is our view that a supplemental courseware pilot project such as this could certainly work to improve student learning and enhance comprehension of information literacy and research concepts. However, based on our experiences over the last academic year, we feel that major considerations are imperative to the success and impact of a project of this scale. A few of our recommendations in different areas are noted in detail below.

Courseware Features & Capabilities

First and foremost, for a courseware project like this to succeed with the greatest possible impact, librarians and/or instructors must have complete control over the creation, deletion, and editing of the module content. Generic, out-of-the-box content will have little effect on students who will not see it as truly relevant to their coursework or class assignments. Our recommendation is that the courseware content must be tailored as specifically as possible to the instructor's assignments, the overall course curriculum, the library's resources, and the institution.

Secondly, librarians and/or faculty must also have access to and full control over the capturing of detailed analytics and robust data regarding student access, progress, and performance in the courseware. Timestamps, video player/viewing statistics, login times and locations, and amount of time spent in each module—in addition to quiz grades and open-ended responses—allowed us to see a complete picture of student performance within the courseware. Without these detailed analytics, we would not have had any insight into how the students actually performed in the courseware.

Additionally, a project like this that relies heavily on software and technical applications must be coupled with quick and easy access to technical support from the courseware providers. Occasional glitches and technical problems can be expected with any software product or platform at any level; we were fortunate enough to have wonderful technical support from the Credo team when these problems did arise. The integrity and accuracy of our project would certainly have suffered greatly without this readily available support.

Academic & Curricular Recommendations

Based on our findings, we can support the anecdotal assertion that students struggle most with understanding the concepts of information ethics, academic integrity, and evaluation of information sources. Information ethics and academic integrity in particular must be addressed in a project like this, regardless of the course in which the courseware modules are embedded. In our view, the academic integrity modules need to be revised in order to address the very real problem of reaching students who do not share the same informational value system as their instructors. Students have been taught that copying is wrong but a generational belief emerged that copying is really not plagiarism but is instead an extension of the real world “mixing and sampling” that happens in their everyday lives. Many students view the information ethics concepts presented by their instructors and librarians as perhaps outdated and/or unrelated to their individual academic success or personal lives. Therefore, student practices and behaviors reflect their own ethical values that correspond with their own value systems, regardless of consequences. One student response summed up this sentiment perfectly: “Stealing is a form of flattery.”

Evaluation of sources for authority, credibility, and bias must also continue to be addressed, especially as information becomes more and more freely available online and as students insist upon relying on Google for research purposes. In the Library, we can do our part by emphasizing this aspect of research more heavily within our library instruction sessions. Further-reaching, however, we strongly recommend that the Communication department curriculum for COMM 2200 be revised to include the graded evaluation of research sources cited in the bibliography component of the final persuasive speech. Our evaluation of the bibliographies for these speeches was eye-opening, to say the least. Unless students receive positive reinforcement for careful evaluation and use of credible sources, and/or negative reinforcement for sloppy evaluation and use of weak sources, their research behaviors will not change or improve. It is one thing to tell students that their sources are either “good” or “bad;” it is another thing entirely to equip them with the tools to evaluate and analyze those resources for themselves, encouraging them to be thoughtful about the types of resources they cite within papers, speeches, or projects. Instructors might even consider requiring students to complete a self-reflection or self-assessment of their sources, including how they located them and why they selected them as a cited source.

Currently, the departmental curriculum for COMM 2200 does not require instructors to grade or evaluate speech outlines or submitted bibliographies; this is based on the premise and assumption that students already receive this type of instruction and evaluation in their ENGL 1020 courses. Grades focus mostly on the presentation of information alone, rather than the presentation of information supported by quality research. In our view, this is dangerous thinking: as our data shows, 82% of the students in our study elected to complete COMM 2200 before taking ENGL 1020. As such, many came to this class ill-prepared for college-level research, perhaps having never completed an argumentative paper or having never created a formal outline for a project. We hope that the Communications department will give serious thought to formally evaluating the research their students are using as foundational support for their speeches.

Additional Recommendations

Other important considerations must also be addressed before undertaking a project of this scope or implementing a similar type of courseware. We recommend considering the following:

1. Time devotion/commitment of staff and/or faculty involved: an enormous time commitment is necessary to evaluate, implement, and support the courseware, in addition to the time necessary to deal directly with collaborating faculty, student concerns, and technical issues. We spent countless hours grading open-ended responses, communicating with students, fielding problems and questions, and just generally making sure everything ran smoothly.
2. Technical expertise needed to keep up with software evolutions and continuous updates to library and free web resources included in the courseware, especially when coupled with the recommendation that the courseware must be tailored as specifically as possible to the particular class, instructor, library, and institution.
3. Curriculum expertise needed to keep up with annual course changes and to redesign and edit the courseware content so it stays fresh, interesting, and relevant for students.
4. Willingness of collaborating faculty to prepare and make available their syllabus and course materials well before classes begin. Extra time is necessary for librarians to carefully review the syllabus and/or textbook, create the relevant courseware content, and then return that content to the faculty for syllabus integration before classes begin.

Overall, it is our recommendation that an online information literacy courseware product such as this, can be a viable option for supplementing one-shot library instruction programs. It is our intention to gather our data, reflect on the strengths and weaknesses of this project, and potentially re-launch it in the future, using a different courseware product.

Conclusion

Supplemental online information literacy courseware has incredible value and many potential uses. Results obtained in this pilot study show a positive correlation between the use of online information literacy courseware and improved academic performance for students in a general education course. However, our study design used online information literacy courseware to supplement one-shot (face-to-face) instruction sessions; therefore, the authors are unable to measure the influence of the courseware and one-shot sessions separately—only in combination with each other. With adequate financial and personnel support, it is our view that online information literacy courseware demonstrates potential for becoming a useful instructional and outreach tool for academic libraries seeking an opportunity to make a measurable impact on student academic success.

Thank Yous and Acknowledgements

A year-long research project on this scale would not have been possible without some fantastic collaborators and colleagues. The authors wish to thank Professor Stephen Decker for his enthusiastic collaboration and willingness to try something new in his Public Speaking classes. We also wish to thank our Dean, Bonnie Allen, for graciously approving this project; our Department Chair, Christy Groves, for her fervent and unwavering support; and our librarian colleagues in the User Services Department at Walker Library for all of their excellent feedback and suggestions. We also wish to thank the great technical support team at Credo for their assistance with our myriad of technical issues.

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Appendix 1: Rubric**Appendix 2: Student Survey Results**