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Using Blackboard to Create Library Research Skills Assessment

Maura A. Smale
CUNY New York City College of Technology

Mariana Regalado
CUNY Brooklyn College

USING BLACKBOARD TO DELIVER LIBRARY RESEARCH SKILLS ASSESSMENT

A Case Study

Maura A. Smale
New York City College of Technology, CUNY

Mariana Regalado
Brooklyn College, CUNY

ABSTRACT

Like other college and university departments, academic libraries are increasingly expected to assess their services and facilities. This article describes an initial step in the development of a comprehensive assessment program for library instruction in the Brooklyn College Library. A pre- and post-quiz were developed based on the curriculum for a required library session in an introductory English composition course. The quizzes were designed to establish a baseline for student knowledge of information literacy as well as measure the effect of library instruction on student learning. We also sought to evaluate the suitability of the Blackboard learning management system for assessment of library instruction. Our discussion of the benefits and limitations of this pilot project will be useful to instruction librarians considering using Blackboard to implement multiple choice quizzes as a means of assessing information literacy and library instruction.

INTRODUCTION

Assessment of library services has become increasingly important in college and university libraries in recent years, including the assessment of information literacy and library instruction. This study involves the development of a quiz at an academic library intended to measure student knowledge of basic research skills taught in the required library session for an introductory English composition class. As one component of our library's developing assessment strategy, our goals include both measuring student learning (summative assessment) and evaluating the library instruction program (formative assessment). We seek to establish an ongoing means of assessing the ways in which our students learn library

research skills, and the intent of this project was to pilot and evaluate one possible strategy.

For this assessment we developed a pre- and post-quiz based on the curriculum for the library session, and administered the quiz to students using the Blackboard learning management system (LMS). While many academic libraries use Blackboard for a variety of library services, there is a dearth of in-depth discussion on the use and efficacy of Blackboard as a delivery platform for a stand-alone assessment of library instruction. We hope that our discussion of the benefits and limitations of this pilot project will be useful to instruction librarians considering using Blackboard to implement multiple-choice quizzes as a means of assessing information literacy and library instruction.

BACKGROUND

Brooklyn College is one of 17 colleges at the City University of New York (CUNY) and enrolls over 13,000 undergraduates (Brooklyn College, 2008a), fully half of whom are transfer students (Brooklyn College, 2008b). The student population reflects a wide range of academic preparation as well as cultural and ethnic diversity. As a public college accredited by the Middle States Commission on Higher Education, the college is, like many academic institutions, increasingly answerable for student learning. The pressure for accountability in higher education is both insistent and pervasive, and we in the library recognize the value of teaching to and measuring student learning outcomes.

One of the central goals of this project was to serve as a first step in the development of a comprehensive assessment program in the Brooklyn College Library. The authors created the English 2 Library Research Skills Quiz in order to pilot and evaluate one method of assessment. Most immediately, assessment presents opportunities to discern what students are and are not actually learning, and encourages us to reexamine our own teaching objectives and methods. More broadly, the authors hope that assessment data will allow the

library to demonstrate one aspect of its contribution to the college's general education goals.

In the past, – the authors' outcomes assessment efforts have been largely limited to the evaluation of immediate comprehension in class via show of hands or one-minute papers. The authors have also implemented surveys of faculty satisfaction with library research instruction and its impact on student learning. The authors wanted to examine student learning more closely, yet the size of the undergraduate population necessitates an assessment method that is not overly burdensome for the instruction librarians. For this pilot project the authors decided to create and administer an electronic pre- and post-quiz to a sample of students using multiple-choice and matching questions that could be scored automatically.

The second goal for this project was to measure student learning. Ultimately, the authors wish to assess whether students are gaining competence in information literacy over their college career, and, in particular, the library's contribution to that learning. However, information literacy is complex, involving both research skills and critical thinking; true competency can only come with repeated experiences and is honed over a student's time at college and beyond. The authors recognize that attending one 75-minute library instruction session will not make students information literate. Rather, the quiz more accurately measures library research skills that are required for college coursework.

Nonetheless, this pilot assessment was valuable for two reasons. First, the pre-quiz helped establish a baseline for student knowledge of information literacy. Brooklyn College students come to English 2 having had diverse prior experiences with libraries, research, and information literacy, yet they all attend the required library session for this course. The creation and implementation of the quiz was also an opportunity to standardize the curriculum for the English 2 library session. The authors planned to analyze the quiz results

and to modify the content of the library session for the future to provide extra support in areas of student weakness (cf. Williams, 2000, p. 324).

Additionally, the post-quiz, which was designed to supplement the surveys of students and faculty mentioned above, can measure the effect of a library instruction session on student learning. English 2, the second of two required composition classes, was targeted for this assessment project. One of this course's stated goals is the development of research techniques, and the course requires a library instruction session for every section. While only half of the students begin their college career with Brooklyn College and many transfer students are exempted from English 2, over 2,500 students take this course annually. Thus, English 2 represents one of the library's best chances to reach a large number of students with basic research skills instruction.

The third and final goal of this pilot study was to evaluate the suitability of Blackboard for library assessment purposes. The authors wanted to administer the quiz electronically for ease of delivery and grading and chose to use Blackboard as the platform for several reasons. Most importantly, Blackboard is the learning management software used at CUNY. The authors wanted to leverage this existing technology and many students' familiarity with it.

With the help of the Multimedia/Instructional Design & Blackboard Support Specialist, the library became an organization within Blackboard in 2007. Both the library and its Ask-a-Librarian chat reference service appear as tabs in Blackboard (Figure 1). The creation of the library organization in Blackboard was not technically difficult but required both outreach and negotiation. Notwithstanding the library's central presence in Blackboard, library faculty at Brooklyn College have not taken much opportunity to use Blackboard or integrate it into existing courses. Having heard about the pros and cons of Blackboard from classroom faculty, the authors decided that this project would be an excellent opportunity for library

FIGURE 1—BROOKLYN COLLEGE LIBRARY IN BLACKBOARD (2008)

faculty to experiment with using the system for instructional purposes.

INFORMATION LITERACY INSTRUCTION ASSESSMENT

Much has been written on the assessment strategies used by academic librarians to evaluate and guide their information literacy instruction programs. Oakleaf (2008, p. 233) provides a thorough overview of the advantages and disadvantages of several popular assessment methods: fixed-choice assessments (e.g., quizzes and tests, including multiple-choice), performance assessments (e.g., portfolios, review of student bibliographies or other work), and rubrics. Burkhardt (2007, pp. 28–30) discusses a wide range of information literacy assessment strategies, including both local case studies and national efforts, such as iSkills, offered by the Educational Testing Service, and Project SAILS, developed at Kent State University. We employed a multiple-choice test for this project. On balance, the benefits of multiple-choice tests—ease of administration and scoring, the ability to compare an individuals' pre- and post-test results and to evaluate results between students over time— outweighed the limitations, in particular, the difficulty in measuring higher-level critical thinking skills (cf. Oakleaf, 2008, pp. 237–239; Williams, 2000, p. 333).

Many academic libraries employ pre- and post-testing when seeking to assess the impact of library and information literacy instruction. As noted by Williams (2000, p. 323), pre- "and post-tests look to measure the impact of instruction or intervention, and deliberately acknowledge the impact of time." Use of pre- and post-tests can elucidate both student mastery of material covered in an instruction session as well as areas of student weakness (Burkhardt, 2007, p. 25, 31). Additionally, pre- and post-test data can be compared over time to further refine the library and information literacy curriculum (Burkhardt, 2007, p. 25, 31; Oakleaf, 2008, p. 235).

Fixed-choice tests are often used in academic libraries to measure learning outcomes for students who have completed library instruction in the classroom (as in our pilot study) or via online tutorials (Fang, 2006; Roberts, 2003). Academic libraries also employ fixed-choice tests to assess the teaching style of the instructor, absorption of content covered in the instruction session, and student attitudes towards research (Kapoun, 2004). These assessments often ask students to rate specific aspects of the session, for example, "clearly stated goals, organization of material, clarity of presentation, and the willingness of [the] librarian to answer questions," (Costello, Lenholt, & Stryker, 2004, p. 454). Others request that students rate their own perceived competence with research tasks and library skills (Dunn, 2002, p. 30). Some libraries feature both questions to assess student learning and questions to evaluate student research confidence on the same fixed-choice assessment (Lindsay, Cummings, Johnson, & Scales, 2006, p. 432).

Academic libraries have used pre- and post-tests to assess students before and after they have been exposed to library and information literacy instruction. Librarians at the University of North Texas developed a stand-alone electronic pre- and post-test to measure the impact of a "one-shot" library instruction session in an introductory English class (Byerly, Downey, & Ramin, 2006, p. 590–1). Karplus (2006, p. 8) describes a pre- and post-test for a series of information literacy tutorials, all delivered via Blackboard. Pre- and post-tests are also used to "target mastery of library skills" for a credit-bearing information literacy course (Burkhardt, 2007, p. 28). Instruction librarians used pre- and post-tests in an Introduction to Public Speaking course to measure "student research confidence, perceptions of information tools, Web evaluation abilities, and assistance-seeking attitudes" (Zoellner, Samson, & Hines, 2008, p. 370). Pre- and post-tests are further employed to evaluate student attitudes towards library instruction after sessions in a traditional classroom setting and online, with the results compared and used to plan the library's information literacy instruction program

(DaCosta & Jones, 2007; Kraemer, Lombardo, & Lepowski, 2007).

BLACKBOARD IN ACADEMIC LIBRARIES

Learning management systems (LMS), such as Blackboard, have been widely adopted by colleges and universities in the past decade because they offer support for diverse student learning styles, ready access to course materials at the student's convenience, and the ability for the instructor and students to continue discussion beyond the classroom. Gradebook and testing features in LMS offer options that faculty may use to streamline the assessment process. While the utility of LMS for distance learning is self-evident, LMS are also frequently used to augment traditional classroom instruction. As colleges and universities have embraced this technology, many academic librarians have sought to integrate library instruction and services with the LMS in use at their campuses.

Brooklyn College and all CUNY schools have implemented the popular LMS from Blackboard, Inc. (version 6.3 for the duration of this project). While there is no obvious place for the library within the Blackboard interface, library science literature features many examples of academic librarians who have used innovative approaches to leverage Blackboard to enhance student learning. Librarians typically use Blackboard in two primary ways: to integrate library resources and services at a Blackboard-wide level and to create a course-level library presence.

Integrating library resources into Blackboard is perhaps the most straightforward way in which librarians can impact student learning within the LMS (George & Martin, 2004, p. 596). Providing library content and links to library resources within Blackboard can help students conduct research more efficiently, as information is available at their point of need (Costello et al., 2004, p. 454). Links to the library's website—the homepage as well as select resource pages (e.g., the catalog, article databases, citation guides)—may be added to a

college's Blackboard instance, as Brooklyn College has done with its library organization tab (Figure 1, above).

Other strategies for incorporating library resources into Blackboard include managing electronic journal articles on reserve for a course within Blackboard (Shank & Dewald, 2003) and creating course-specific research guides for instructors to add to their Blackboard sites (Costello et al., 2004, p. 454; Jackson, 2007, p. 456; Ladner, Beagle, Steele, J.R. & Steele, L., 2004, p. 332). Some research has shown that students appreciate the availability of the research guides throughout the semester (Costello et al., 2004, p. 455).

Librarians have also created online tutorials in information literacy for inclusion in Blackboard, either uploaded into their own Blackboard course site (DaCosta & Jones, 2007; Karplus, 2006; Kirlew, 2006; Pandya, 2007), or housed in an area within Blackboard that is accessible to all students (Fang, 2006; Roberts, 2003). As with research guides, incorporating library research tutorials into Blackboard provides librarians with an opportunity to extend the reach of information literacy instruction beyond the traditional, "one-shot" library session (Jackson, 2007, p. 459).

Librarians have also become involved in Blackboard at the course level. Cox (2002, p. 12–13) has offered practical strategies for collaborating with classroom faculty in a Blackboard course: A librarian may be added to an instructor's Blackboard course site, allowing the librarian to participate in the discussion forum (cf. Giles, 2004). Although time-intensive, this kind of collaboration can help students both in the class and in the library (Giles, 2004, p. 262). Librarians have also used Blackboard to teach credit-bearing information literacy courses (Getty, Burd, & Burns, 2000, p. 352–353; Zhang, 2002).

LIBRARY RESEARCH SKILLS QUIZ

The first task when creating the Library Research Skills Quiz for English 2 was to

determine which information literacy topics to include. The CUNY Library Information Literacy Advisory Committee (LILAC) compiled a set of Information Literacy Learning Goals and Objectives for all students who have completed 60 college credits; the University Librarian and Council of Chief Librarians approved these goals in the fall of 2007. These goals and objectives were adapted from the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education and were streamlined for local use. With these goals CUNY libraries sought to establish a basis for articulating and coordinating library and research instruction assessment across the University. The authors used the LILAC goals and objectives as the basis for the quiz to facilitate sharing the quiz questions we developed with the other colleges across CUNY (LILAC, 2007).

Since students were expected to complete the quiz outside of their English 2 classroom time, we strove to create a quiz that could be completed in no more than 30 minutes. We decided on seven major categories for the quiz and a total of 22 multiple-choice or matching questions, each of which addresses a specific topic within a category (Appendix 1). Like the LILAC goals themselves, the order of categories and quiz questions approximately follows the process of completing a research-based assignment, and reflects the curriculum of the required library instruction session. For questions that involved selecting an appropriate research topic or keywords, actual Brooklyn College courses were used to frame the questions (e.g., Psychology of Prejudice, Nutrition and World Hunger). After we finished writing and reviewing the questions, we requested comments and suggestions from the Brooklyn College Library Instruction Committee as well as our undergraduate library intern, who was then in her senior year at the college.

After the quiz questions were finalized, we entered them into Blackboard. Since the library exists as an organization tab in the Brooklyn

College instance of Blackboard (Figure 1, above), we were able to add an assignments link to the left navigation bar in the library tab and create the quiz within that area. Blackboard allows instructors to enter feedback to be presented to a student upon completion of the quiz, and we used that function to provide unique feedback responses for both correct and incorrect answers to all quiz questions. We wrote four versions of each question, hoping that we could use Blackboard to randomly generate a new quiz each time a student logged in, to impede academic dishonesty. However, it is only possible to generate randomized questions for an entire test in Blackboard, not for each topic as we desired. In the end, we created four separate versions of the quiz within Blackboard.

Students in each of the three targeted sections of English 2 took the pre-quiz over a two-week period in late February and early March 2008, before attending their library instruction session. Since the instructor was not using Blackboard for this course, handouts with information about logging into the system were distributed to the students several weeks before the pre-quiz; students were encouraged to verify that they could successfully login to Blackboard before the pre-quiz period began. Each version of the quiz was uniquely password-protected; students were randomly assigned a version of the quiz to complete.

Library instruction sessions took place in mid-March 2008. The post-quiz was administered over a one-week period in early May 2008, by which time the students had attended their library instruction session and completed their research paper assignment for the course. For the post-quiz, students were assigned a different version of the assessment than they had completed for the pre-quiz. New passwords were set for each version of the quiz before the post-quiz period began.

Blackboard automatically scores multiple-choice and matching quiz questions and displays aggregate student scores in its Gradebook area; it was easy to export that information from

Blackboard to a spreadsheet for analysis. The grades for all students were shared with the course professor, who required students to take the quiz and included their scores in the research assessment for their final grades. We were also interested in students' performance at the individual question level, both to gauge their research skills in each of our categories and topics, and to identify any problematic quiz questions that were too easy or too difficult. We created a rubric with three levels of assessment (Insufficient, Developing, and Proficient) to guide us in our analysis of student performance in each information literacy category (Appendix 2). For each student we calculated both a grade as well as an assessment of competence in each of the research skill categories for both the pre- and post-quiz.

DISCUSSION

Many aspects of this pilot quiz project were successful. We had hoped to measure our English 2 students' facility with college research and to evaluate whether these students achieved the learning outcomes for our library instruction session, both measures of students' information literacy. Forty-nine students took the pre-quiz. Their scores ranged widely, from a low of 23% to a high of 93% (Figure 2). The mean score was 70%, and the median was slightly higher at 73%. This suggests that the majority of the students had already acquired a fairly high level of research skill when coming into their English 2 course.

To assess student learning gained after attending the library instruction session and completing a research paper assignment, we compared quiz results for the thirty students who took both the pre-quiz and the post-quiz. Post-quiz scores (for students who took both) ranged from a low of 40% to a high of 93% (Figure 3). Mean student scores increased to 77% on the post-quiz, and the median rose to 80%.

FIGURE 2—PRE-QUIZ STUDENT SCORES (N=49)
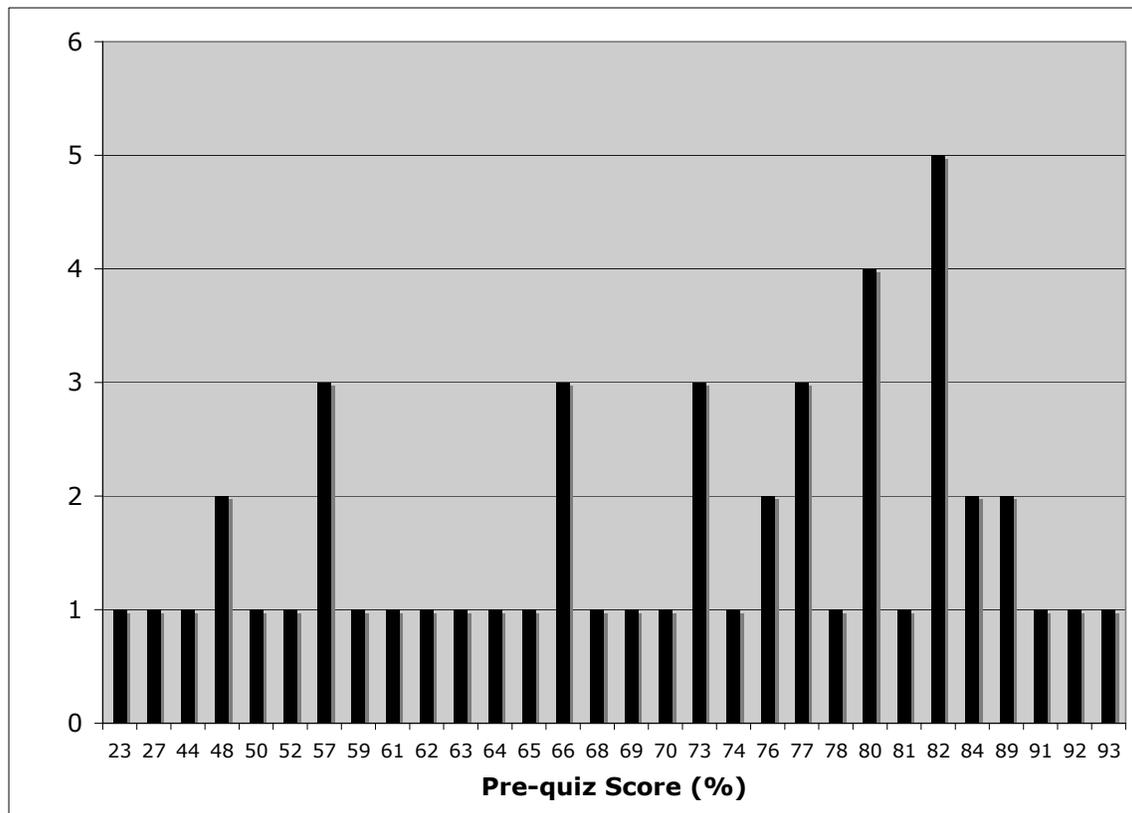
Most student scores improved between the pre- and post-quiz (Figure 4), suggesting that the majority of students did fulfill the research skills learning outcomes for the English 2 library instruction session. Of the 30 students who took both quizzes, five students raised their scores by more than 20%, seven by 10-20%, and ten by 0-10%. Eight students saw their scores decrease between the pre- and post-quiz, though in nearly all of these cases scores declined by less than 10%. The exception is one student whose score declined by a surprising 27% between quizzes; curiously, this student received the highest score on the pre-quiz (93%). Of course, many factors may have affected the student's performance on the post-quiz. Omitting this outlier from our calculations did not impact either the mean or median for the post-quiz.

We also examined student pre- and post-quiz data at the question level. Quiz questions were organized into seven categories of information literacy proficiencies, within which each question represented a specific research skill.

We used our rubric to determine each student's competency level in each category: Insufficient, Developing and Proficient (Appendix 2). As with student scores on the pre-quiz, the average competency levels for the 49 students who completed the pre-quiz were fairly high (Table 1).

Since student competency levels on the pre-quiz were at the highest point—Proficient—for five out of the seven categories, there was not much room for improvement on the post-quiz. However, student performance on the questions in Category 3 did improve from Developing to Proficient between the two quizzes (Table 2).

Another goal for this project was to standardize the learning outcomes for the English 2 library session, with the corollary goal of assisting the library faculty who teach these sessions. While we did have an outline of topics that all instruction librarians used for the English 2 library sessions, we took this opportunity to reconsider and codify our student learning
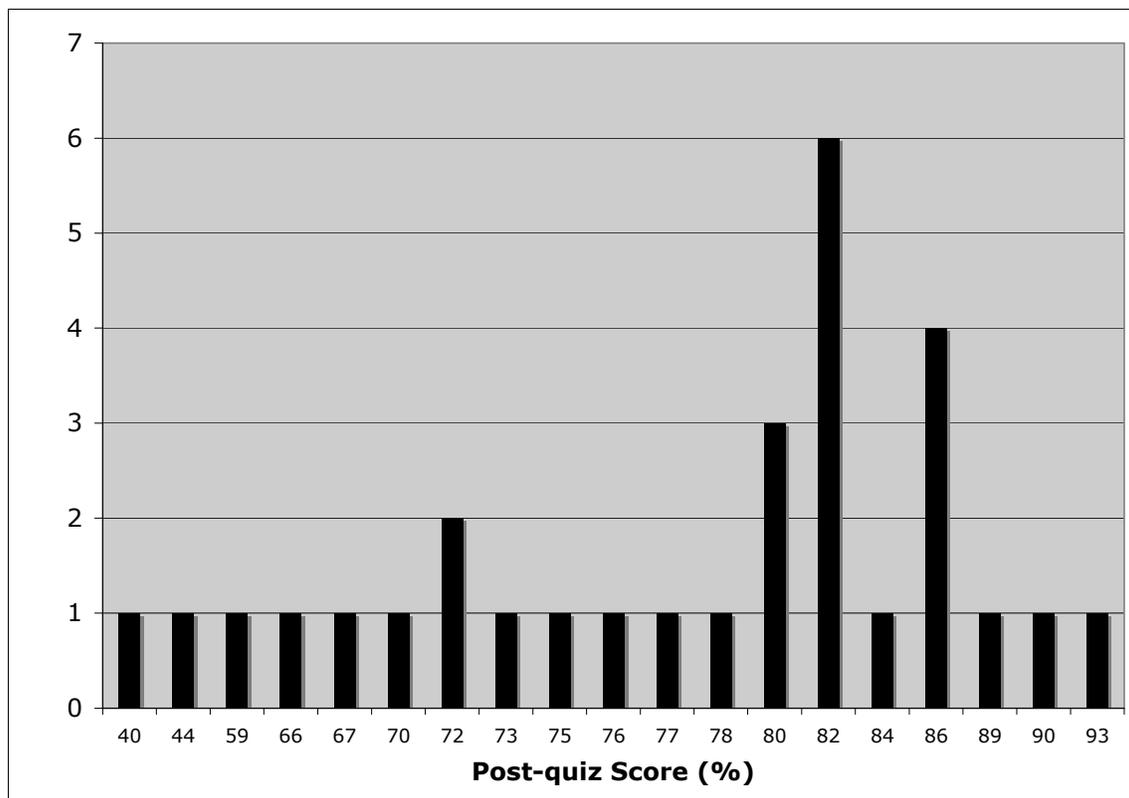
FIGURE 3: POST-QUIZ STUDENT SCORES (N=30)

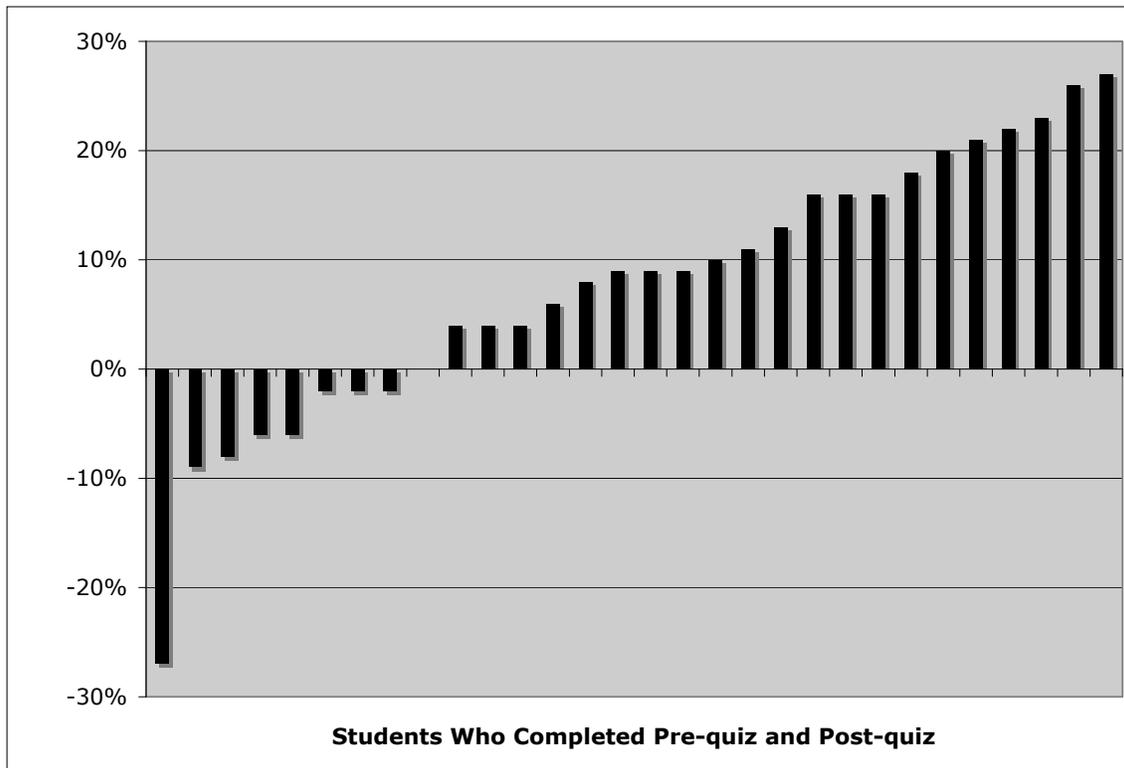FIGURE 4—CHANGE IN STUDENT SCORES FROM PRE-QUIZ TO POST-QUIZ

TABLE 1—PRE-QUIZ STUDENT COMPETENCY LEVELS, BY CATEGORY

Category	Average Level
1. How to define and articulate your need for information	Developing
2. How information is organized and where to find it	Proficient
3. Using effective search strategies to find information from a variety of sources	Developing
4. How to refine your search strategy if necessary	Proficient
5. How to evaluate information and its sources	Proficient
6. How to use information responsibly	Proficient
7. How to find research help	Proficient

TABLE 2—POST-QUIZ STUDENT COMPETENCY LEVELS, BY CATEGORY

Category	Average Level
1. How to define and articulate your need for information	Developing
2. How information is organized and where to find it	Proficient
3. Using effective search strategies to find information from a variety of sources	Proficient
4. How to refine your search strategy if necessary	Proficient
5. How to evaluate information and its sources	Proficient
6. How to use information responsibly	Proficient
7. How to find research help	Proficient

outcomes for this session. We consider the list of categories and topics covered in the quizzes to be an appropriate curriculum for the English 2 library instruction session. The ability to track student performance by category and topic has given us useful data on our students' strengths and weaknesses, and will allow us to revise the content we present in our library sessions accordingly.

The final goal was to evaluate the effectiveness of using Blackboard to administer an assessment of research skills to multiple class sections by the library. There are certainly advantages to using Blackboard for the English 2 quizzes. Students can take the quiz at a time and place that is convenient for them, and in-class time is not required for either English or library faculty to administer the quiz. Students can immediately see their scores and detailed feedback, which allows them to assess their own research skills proficiencies. And, since not every course at Brooklyn College uses the Blackboard LMS, the delivery of the quiz via Blackboard ensures that students are exposed to this online learning technology.

LIMITATIONS

While we deemed this pilot project successful on many levels, we also identified drawbacks, including several minor issues related to our learning goals for students in the English 2 library session. More serious were the limitations we encountered involving the use of Blackboard as a delivery platform for these quizzes.

The authors sought to assess whether students' research skills improved after attending the library instruction session and completing their research projects. While the majority of students did improve between the pre- and post-quiz, eight students saw their scores decrease (Figure 4, above). While many factors, including "end-of-semesteritis," may have contributed to the decline in those students' scores, we also recognize that, as mentioned above, the mastery of research skills is an iterative process that develops over time, and it may be difficult to

measure change in these competencies after one 75-minute library instruction session and one research project.

There were two quiz questions on which most students scored 3 points or less out of a possible 10 points. One of these questions asks the student to identify a topic of a manageable size for a five-page paper, and the other requires students to examine a thesis statement and select appropriate keywords and synonyms to use when searching. It is difficult to determine whether the consistently low scores reflect student weaknesses or poorly-worded questions. In the future we plan to revise these questions and increase the amount of time that instruction librarians spend covering these topics in the English 2 library session.

The goal to standardize the content presented in the English 2 library session was worthwhile; however, classroom realities will likely prevent the authors from completely achieving that goal. English 2 class sessions are usually only 75 minutes in length, and it is difficult, if not impossible, to cover all information literacy topics in a "one-shot" of this nature and even more challenging for students to absorb them. The authors attempt to tailor the library session to the specific research assignment that each English 2 professor has given to his or her class, and may need to demonstrate multiple databases or search techniques. To increase engagement the authors provide students with time to practice searching the library catalog and databases for resources on their topics. Thus, the classroom time for the standardized research skills content is certainly constrained. Nevertheless, regardless of individual differences in teaching styles or variations in resources used, the authors are confident that shared goals for English 2 instruction will benefit students.

Although glad for an opportunity to experiment with it, the authors feel that the disadvantages of using Blackboard to administer the quiz outweighed its advantages. Most critically, quiz design in Blackboard did not prove to be as customizable as we had hoped. While our

questions were organized into categories, we were unable to display the categories as section titles on the quiz. Further, we could not include an open feedback field that did not require grading by library faculty; this impeded the student's ability to get his or her score and feedback immediately. For the post-quiz we removed the feedback field entirely and used an additional "quiz" with one essay question to request feedback. We were disappointed but not surprised to find that none of the students provided any feedback for the post-quiz.

In addition, Blackboard did not allow us to randomize questions in the preferred fashion. We wrote four versions of each topic-specific question and wanted each quiz to consist of randomly generated questions that preserved the progression of categories and topics. The categories and topics approximate the process of doing research, and we intended for students to progress through them sequentially as they took the quiz. While Blackboard does allow for randomly generated quizzes, the control is not granular enough to enable randomization at the category or question level. Thus, we created four separate versions of the quiz, and assigned each student a different version for the pre-quiz and post-quiz.

Finally, Blackboard's Gradebook functionalities were disappointing. While aggregate quiz scores for all students may be downloaded from Blackboard, it is impossible to export student scores on an individual question basis. Since student proficiency levels in each information literacy category and topic are of interest to us, we need these data. The only way we could extract question-level scores from Blackboard was to visit the detailed quiz results page for each student and enter his or her scores into a spreadsheet individually. This process was exceedingly time-intensive, even for our small sample.

Both the lack of customized randomization as well as the inability to export individual question scores are serious constraints on using Blackboard to administer the English 2 Library Research Skills Quiz. The inability to randomize the quiz by question implies that library faculty would need to create new versions of the quiz to discourage student cheating. The time required for library faculty to pull student scores out of Blackboard for each question all but negates the time saved by using a LMS rather than a paper quiz. While we do intend to pursue assessment strategies for library sessions in English 2 as well as other courses at Brooklyn College, currently it appears that Blackboard is not our best delivery platform option.

CONCLUSIONS AND NEXT STEPS

While there were limitations to this study, we consider the English 2 Library Research Skills Quiz project to be a success. We accomplished our three goals for the study: 1) to pilot an additional means of assessing the contributions of the library to Brooklyn College information literacy goals, 2) to measure student learning in and standardize content for the English 2 library instruction session, and 3) to determine whether the Blackboard LMS is a suitable option for administering a multiple-choice quiz to many students per semester.

To increase the size of our data set, we planned to run the pre- and post-quiz with several sections of English 2 in the Spring 2009 semester after Brooklyn College had completed the migration to version 8 of Blackboard. We were eager to experiment with the new version and hoped that it would allow us to overcome some of the critical flaws we found in using Blackboard 6.3 for these quizzes. Disappointingly, unforeseen technical difficulties prevented us from running the quiz during the Spring 2009 semester. We are currently investigating other platforms for delivery of this quiz, including other LMS, such as Sakai and Moodle. We are also exploring the possibility of building a custom quiz management system in-house in partnership with Brooklyn College's Office of Academic Information Technologies.

Moving forward, we will continue to consider and refine the pre- and post-quiz. We have

invited additional library faculty from across CUNY to examine the quiz questions, suggest revisions, and contribute additional quiz questions of relevance to library and information literacy instruction. We also plan to work more closely with faculty teaching English 2 to address the rate of student participation. Only 30 of the 62 students in the three sections of English 2 included in this pilot took both the pre- and post-quiz. Stronger incentives for students to take the quizzes – perhaps the offer of extra credit – could increase the numbers of completed pre- and post-quizzes in our data set, which should give us a clearer picture of student competencies.

Ultimately we hope that this quiz will serve as a useful component of our overall library and information literacy instruction assessment strategy. We intend to partner with English 2 faculty to incorporate additional means of measuring student information literacy competencies, for example, examining research papers and bibliographies, to determine whether there are correlations with students' quiz scores. This study has necessarily focused on library research skills, the curriculum for our English 2 instruction, due in large part to the constraints of our "one-shot" library instruction session. It is likely that a multiple-choice quiz delivered via Blackboard or any LMS is not well-suited to assess many aspects of information literacy, such as critical thinking and appropriate use of information. In the future it will be productive to explore assessment of the full range of information literacy competencies, using both fixed-choice and other assessment methods.

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APPENDIX 1—BROOKLYN COLLEGE ENGLISH 2 LIBRARY RESEARCH SKILLS QUIZ: CATEGORIES AND TOPICS

1. How to define and articulate (put into words) your need for information
    a. Gathering background information
    b. Selecting a topic with manageable focus

2. How information is organized and where to find it
    a. Places to find information (free web vs. library resources)
    b. Format of information (books, articles, websites)
    c. Types of published information (scholarly vs. popular)
    d. Scholarly information is organized by subject

3. How to use effective search strategies to find information online or in print from a variety of sources
    a. From thesis statement to search terms
    b. Keywords and synonyms
    c. Searching subject headings
    d. Scholarly vs. informal language
    e. Creating a search statement
    f. Off-campus access to library resources
    g. Book table of contents and index

4. How to refine your search strategy if necessary
    a. How to deal with too many results
    b. How to deal with too few results

5. How to evaluate information and its sources
    a. Criteria for evaluation (point of view, authority, reliability, timeliness)
    b. Scholarly (peer review) vs. popular

6. How to use information responsibly
    a. Academic honesty
    b. Quoting and paraphrasing
    c. Citation style
    d. Parts of a citation

7. How to find research help
    a. Ask a librarian!

APPENDIX 2—BROOKLYN COLLEGE ENGLISH 2 LIBRARY RESEARCH SKILLS QUIZ: GRADING RUBRIC

LEARNING OBJECTIVE	INSUFFICIENT	DEVELOPING	PROFICIENT
How to define and articulate (put into words) your need for information 1. Gathering background information 2. Selecting a topic with manageable focus	No idea of how to define and articulate need for information (0 correct answers)	Some idea of how to define and articulate need for information (1 correct answer)	Clear idea of how to define and articulate need for information (2 correct answers)
How information is organized and where to find it 3. Places to find information (free web vs. library resources) 4. Format of information (books, articles, websites) 5. Types of published information (scholarly vs. popular) 6. Scholarly information is organized by subject	No idea of how information is organized and where to find it (0 correct answers)	Some idea of how information is organized and where to find it (1-2 correct answers)	Clear idea of how information is organized and where to find it (3-4 correct answers)
How to use effective search strategies to find information online or in print from a variety of sources 7. From thesis statement to search terms 8. Keywords and synonyms 9. Searching subject headings 10. Scholarly vs. informal language 11. Creating a search statement 12. Off-campus access 13. Book table of contents and index	No idea of how to use effective search strategies to find information (0-2 correct answers)	Some idea of how to use effective search strategies to find information (3-5 correct answers)	Clear idea of how to use effective search strategies to find information (6-7 correct answers)

APPENDIX 2—BROOKLYN COLLEGE ENGLISH 2 LIBRARY RESEARCH SKILLS QUIZ: GRADING RUBRIC (CONTINUED)

LEARNING OBJECTIVE	INSUFFICIENT	DEVELOPING	PROFICIENT
How to refine your search strategy if necessary 14. How to deal with too many results 15. How to deal with too few results	No idea of how to refine search strategy (0 correct answers)	Some idea of how to refine search strategy (1 correct answer)	Clear idea of how to refine search strategy (2 correct answers)
How to evaluate information and its sources 16. Criteria for evaluation (point of view, authority, reliability, timeliness) 17. Scholarly (peer review) vs. popular	No idea of how to evaluate information and its sources (0 correct answers)	Some idea of how to evaluate information and its sources (1 correct answer)	Clear idea of how to evaluate information and its sources (2 correct answers)
How to use information responsibly 18. Academic honesty 19. Quoting and paraphrasing 20. Citation style 21. Parts of a citation	No idea of how to use information responsibly (0 correct answers)	Some idea of how to use information responsibly (1-2 correct answers)	Clear idea of how to use information responsibly (3-4 correct answers)
How to find research help 22. Ask a librarian!	No idea of how to find research help (0 correct answers)	Some idea of how to find research help (0-1 correct answers)	Clear idea of how to find research help (1 correct answer)