Collaboration for point-of-need library instruction

Chuck Malenfant and Nora Egan Demers

The authors

Chuck Malenfant is Associate University Librarian, Library Services and **Nora Egan Demers** is Assistant Professor of Biology, College of Arts and Sciences, both at Florida Gulf Coast University, Fort Myers, Florida, USA.

Abstract

Beginning in the spring of 2001, a librarian and a member of the teaching faculty collaborated on an advanced information literacy instructional experience through the teaching faculty's "Issues in Science and Technology" classes. They collected data from the students both before and after the advanced information literacy instructional sessions that included the students' own attitudes about, and perceived level of, information literacy. Additionally, the instructor assigned point values to assignments directly related to the information literacy instruction her students received, thereby encouraging participation. The collaborators found that increasing the point values of the related assignments also increased student participation and performance. They also found strong indications that offering advanced library instruction to upper-division students at their point of need, as they are facing more challenging research assignments in their regular coursework, also increases student interest and participation in the program.

Background

The Florida Gulf Coast University (FGCU) Library serves a campus of approximately 3,000 full-time and full-time-equivalent students, a figure that is growing rapidly. The FGCU Library has approximately 250,000 volumes and an annual collection budget of approximately $1.2 million. The library adds approximately 10-15,000 volumes per year in support of a growing curriculum of 38 baccalaureate degrees and 18 master's degrees in five colleges. The library also has access to approximately 270 online databases, made possible in large part because it participates in the consortium of the libraries of the state universities of Florida, providing its students access to a much larger electronic collection than a university of its size would typically have on its own, and underscoring the need for an advanced information literacy program.

Information literacy at the university

The unprecedented availability of information provided by the worldwide Web, full-text electronic databases and library consortia can leave students drowning in information they are ill-prepared to evaluate and sort, or worse, can create a situation in which students choose the first pieces of information they see without regard to value, context or appropriateness to their research.

As has been well documented, these developments have also meant a change in role for many academic librarians (e.g. Hope *et al.*, 2001; Tolppanen, 1999). Librarians who once carefully evaluated and selected materials for their collections are increasingly losing control over the quality of information to which their students are exposed. Additionally, widely available open and free access to the Internet provided by libraries, universities and other educational institutions means that students search for much of their information on the worldwide Web rather than using more traditional and often more authoritative sources. Librarians must now work to teach these students how to select information wisely for themselves.

Using the Association of College & Research Library's 1987 "Model statement of objectives for academic bibliographic instruction" (Arp *et al.*, 1987), the FGCU Library developed an Information Literacy Program in 1998 (see http://library.fgcu.edu/Policies/infolit.htm) to address these issues. The program divides various

information literacy competencies into "Tier I" (introductory) competencies and "Tier II" (advanced) competencies. Over the last several years, the library has developed a suite of instructional programs and materials addressing the "Tier I" competencies. Chief among these are "Search for the Skunk Ape: An Information Literacy Quest" and "Basic Library Training".

"Search for the Skunk Ape" (see http://ruby.fgcu.edu/courses/cslater/skunkape/menu.html) is a self-paced, interactive Web-based instructional module that the library has, over the last several years, had some success in integrating into "Styles and ways of learning", a one-credit-hour course required of all incoming freshmen. The material presents the students with the problem of researching the Skunk Ape – a version of Bigfoot reputed to be haunting the swamps of South Florida – and demonstrates the basics of beginning-level research using the library.

"Basic Library Training" (see http://library.fgcu.edu/Instruction/tutorials.htm) is a one-hour traditional orientation to library services focused on how to use the library's Web site to access books, periodical literature and other key resources and services provided by the library, such as e-mail reference, accessing full-text documents from off-campus and inter-library loan.

The project under discussion here, developed by Chuck Malenfant, Arts and Sciences Librarian at FGCU and Dr Nora Egan Demers, Assistant Professor of Biology at FGCU, is aimed at developing "Tier II" competencies. The intent is to offer students who have already been exposed to the library's introductory programs a deeper and more comprehensive understanding of how information is gathered, transmitted, organized and used in college-level scholarship and in their particular field of study.

Issues in Science and Technology

"Issues in Science and Technology" is an interdisciplinary course that addresses societal concerns brought on by technological advances. The course is one of several that constitute the Collegium of Integrated Learning. The Collegium is the core upper-division offering in the College of Arts and Sciences and is required of all students, regardless of their majors. Rather than focusing on specific course content, the goal of the collegium courses is to assist students in improving their abilities to reach the university's student learning outcomes.

This set of nine student-learning outcomes addresses the goals the university determined to be the critical components to a strong liberal arts

undergraduate education (see www.fgcu.edu/info/outcomes.asp). Collegium courses assist students in improving the level of competency in these outcomes so they can demonstrate increasing skill and competency as they progress through their formal education and beyond.

These outcomes are similar to the Association of American Colleges and Universities' statement on Liberal learning (see www.aacu-edu.org/about/mission.cfm#liberal). The specific student outcomes identified for "Issues in Science & Technology" include effective communication, information literacy, problem solving and technological literacy. The relationship with the library information literacy program and its competencies is evident.

In "Issues in Science and Technology", students and faculty work together to investigate selected contemporary science and technology issues and problems and how they have developed over time. Demers also uses the course to help these upper-division students meet the American Association for the Advancement of Science Project 2061: Science for All Americans goals (Rutherford and Ahlgren, 1990).

Demers' style of teaching is constructivist in nature. Individually and in teams, students develop "intellectual histories" of an issue or problem. These "histories" require building an integrated context by examining issues through the perspectives and methods of knowing in the social sciences, natural sciences and humanities.

Organized in interdisciplinary ways and problem-based, the course stresses engaged learning. Students are expected to formulate their own interpretations and responses to the issues. Consequently, success in the course relies heavily on critical, creative, systematic and collaborative thinking and the sophisticated use of communication, information and technological skills.

In Demers' section of this course (Demers, 2003), students are required to create historical timelines of the scientific and technological issues they are exploring, prepare an annotated bibliography including books, journals, and Web resources, debate their issues, and submit written reports.

Demers' students examine a wide range of science-related issues. Topics her students have tackled in the past include whether there should be harsher pesticide laws to protect children, whether genetic testing for cystic fibrosis should be an option for expectant parents, whether it is unethical to "harvest" transplantable organs from those deemed medically "brain dead", and more.

The course exposes students to the history and process of science using *Scientific Endeavor: A*

Primer on Scientific Principles and Practice (Lee, 2000) and then approaches their learning about current issues in a scientific manner. Students are expected to draw on their interdisciplinary knowledge to communicate the complex nature of the issue. The format is discussion based, with Demers acting as facilitator.

In order to ensure that her students understand the context, history and development of current issues in science and technology, Demers structures the course and assignments such that student success depends on effective library research rather than on a set of assigned readings or required texts. The course offers a scaffold of assignments that leads the students through the process of acquiring and evaluating information as they question their hypotheses about the issues they have elected to research. The requirement to finish these assignments as students prepare to compose their oral and written reports underscores the importance of the library's Information Literacy Program.

To improve students' information literacy and help them meet the course outcomes, Demers was enthusiastic about collaborating with Chuck Malenfant on the project to develop advanced information literacy instruction and materials.

The wealth of books and electronic resources available from the library and the Internet serve as the resources for exploration of the chosen issues. By hands-on participation, the students gain technological and information literacy, two of the student learning outcomes identified for the course. Each semester, Demers has incorporated the course work more closely with the library's Information Literacy Program and the reference staff at the university.

It is important to remember that although the students are almost all juniors and seniors, they are not by any means all science majors. The course's interdisciplinary nature means that Malenfant cannot use the lessons he has developed for typical upper-division science students who are using databases like Aquatic Science & Fisheries Abstracts and Microbiology A, B, & C to access the professional scientific literature. Instead, the materials he and Demers developed focus on advanced information literacy techniques to be used in any research situation (e.g. Mellon, 1984), including the use of more general databases like ProQuest and Academic Index.

The proposal

Demers and Malenfant's collaboration began with a proposal for an advanced information literacy program that Malenfant submitted to a number of College of Arts & Sciences faculty members who teach "Issues in Science and Technology". According to the proposal, the program would follow the same format as the existing "Search for the Skunk Ape" tutorial and would consist of three parts:

(1) Part one, Forming a question.
(2) Part two, Advanced searching.
(3) Part three, The scholarly community.

Each part would be designed as a stand-alone, Web-based tutorial accessed through the "Online Training" link via the library's homepage. Instructors interested in participating would require students to view one, two or all of the tutorials during the semester, either according to the instructor's schedule or at each student's own pace. The library would provide a set of homework exercises for each of the tutorials, as well as answer keys, and participating instructors could choose to grade the homework and include it as part of the students' workload. Composite grades from participating instructors as well as feedback from students and instructors would serve in part as the library's outcome measures. Students would be encouraged to seek assistance with the tutorials and exercises directly from the librarian working with their class.

In the first part of the semester, interested instructors would schedule a 45-minute training session for their classes with a librarian. During this time, the librarian would show the students how to access the tutorials, explain to them their instructor's requirements, show them some sample exercises, and provide them with contact information. As the students were working on their exercises during the semester, they would be encouraged to contact the librarian working with their class for assistance.

Overall, the program was designed both to allow flexibility for the instructor and to take up a minimal amount of class time while still covering enough material to provide a meaningful learning experience for the students.

Collaborating on the development of materials

Malenfant was hoping that one or more members of the teaching faculty would agree to let him use their "Issues in Science and Technology" courses as a venue to develop his material and try out his instructional strategies. Demers was interested not only in having her students exposed to advanced information literacy concepts, but also in working together with Malenfant throughout the development of the program. She also fully

intended to integrate the concepts into graded assignments that her students would work on throughout the semester. This was an unexpected boon to Malenfant, and meant the project would have much more of an impact on the students, as well as on library/teaching faculty relations (e.g. Walter, 2000), than Malenfant originally thought.

What Demers and Malenfant actually developed in the course of their collaboration bore little resemblance to the materials originally proposed, although, importantly, many of the information literacy competencies were retained.

For example, the very limited time that the library's computing and technology staff of three, already charged with maintaining the library's 800-plus page Web site as well as one of the busiest student computer labs on campus, had to devote to the support of this project meant that the idea of interactive Web-based tutorials was abandoned fairly early on in favor of classroom presentations with handouts.

Also, Demers strongly favored an instructional session of one to one-and-a-half hours over the more self-paced, self-directed model originally proposed. She felt that the best way to ensure the students were exposed to the material was to have a required class session devoted to the material. This meant that the three hours of content Malenfant had envisioned were reduced to 90 minutes of lecture and demonstration concurrent with in-class hands-on exercises.

Malenfant saw this as a potentially disastrous drawback, as the instructional outcomes he was proposing could not possibly be covered adequately in a single session. As Withers and Sharpe (1999) suggest, however, the limited contact time permitted by a single instructional session can be used as a valuable opportunity to market the library and its services. Furthermore, since Demers planned on integrating the instructional outcomes into course assignments due at different times throughout the semester (e.g. Fox and Weston, 1993), the two were able to develop an instructional session that serves as a springboard to the upcoming assignments together with a repeated message to seek assistance at the reference desk or, better yet, make an appointment to meet with Malenfant, as the assignments come due.

The lectures are scheduled in a computer classroom where students are encouraged to imitate the search techniques modeled by Malenfant using their own search terms as he displays the library Web pages and a PowerPoint instruction guide on a screen for the class to see.

Malenfant provides handouts based on the PowerPoint presentation for the students to take notes on, a Library of Congress catalog system informational sheet, reference material listings, several assignment sheets developed especially for the class, and tri-fold brochures that provide detailed instructions on the research process (described more fully below). Class activities are reinforced by worksheet assignments that require the students to visit the library, either online or in person, and begin their research by practicing the skills modeled in the training session.

Demers also contributed valuable new ideas to the project not included in the proposal. For example, she created a rubric and graded assignments based on the instructional content. She also integrated the instruction further into her curriculum by suggesting and aiding in the creation of a pathfinder to help her students research the history of scientific issues.

Together, Demers and Malenfant developed an instructional program and corresponding handouts that cover advanced database searching techniques, forming a question and making a research plan, and evaluating Internet and other resources. With the help of a second librarian, they also developed a handout that covers bibliographies and annotated bibliographies. Table I describes each of the topics and associated handouts Demers and Malenfant developed and which information literacy outcomes they address.

The materials are structured so that a number of information literacy competencies are addressed a number of times. Demers and Malenfant feel that this is a more practical and effective pedagogical method than attempting to establish a one-on-one relationship between the materials and the competencies would have been.

Implementation

Malenfant gave his first presentation in one of Demers' "Issues" courses in the spring of 2001. Malenfant continued presenting the instructional session in Demers' classes through the spring of 2003.

Following his presentations, students work on the following four assignments designed by Demers and Malenfant to reinforce the content of the session through active learning.

Research plan
For this assignment, students are given the following instructions by Demers, both verbally and through the course Web site:

> Your assignment is to attempt to falsify your hypothesis regarding an issue in science and technology. You should include as much detail and exact resources as you can at this time, so that I can provide you with valuable feedback and potentially

Table I Topics and associated hand-outs created by Demers and Malenfant and the information literacy outcomes they meet

Topic/hand-out	Content	Information literacy competencies
How to write an annotated bibliography	The purpose of bibliographies The format and content of an annotated bibliography Citations and URLs for MLA and APA guides	Ability 2: How information sources are structured
Advanced searching	Using Boolean operators The purposes and uses of subject headings Distinguishing subject searching from keyword searching Selecting the appropriate research database for one's purpose	Ability 3: How information sources are intellectually accessed by users Ability 4: how information sources are physically organized and accessed
Forming a question and making a research plan	Using specialized encyclopedias and other online and print reference resources to gain overviews of topics and to construct lists of keywords for searching Using sample searches to test database and keyword results Using publication date, subject headings, Boolean operators, variant keyword combinations and other criteria to broaden or narrow searches Keeping a research log Exploring database Internet search engines like INSPEC Scirus, Worldcat and Britannica's Internet Guide as alternatives to non-academic search engines	Ability 1: How information is identified and defined by experts Ability 2: How information sources are structured Ability 3: How information sources are intellectually accessed by users
Evaluating print and Internet resources	Building an awareness of the unedited, unrefereed and non-academic nature of much published and Web-based information Evaluating information based on criteria like the author's credentials, the nature of the publisher and of the sponsor, suitability of the source for the purpose at hand, and the accuracy, timeliness and uniqueness of the information	Ability 1: How information is identified and defined by experts Ability 2: How information sources are structured
Building your timeline	A library pathfinder introducing students to the available monographic, reference and online resources useful for tracing the history of scientific issues and developments	Ability 1: How information is identified and defined by experts

additional resources to aid your work. You should be working closely with the reference staff who can help you find appropriate and valuable information. You could consider this worksheet a draft of your annotated bibliography.

Timeline

For this assignment, students are given the following instructions by Demers, both verbally and through the course Web site:

> This assignment asks you to provide an historical perspective of the issue you have selected to research. It asks you to develop an "intellectual history" of the issue.Go as far back in time as you can, and provide the most pertinent events that have helped shape your topic into the issue of such a magnitude that you selected it for this course. Historical information will tend to be general to the field you have selected to explore. As you approach more recent times, the information should become more specific to your issue. Provide the names and dates of the most important historical contributors to your issue – and as usual – provide complete citations for your timeline.

Evaluating Web sites

For this assignment, students are given the following instructions by Demers, both verbally and through the course Web site:

> Select what you consider to be the most valuable and the least valuable websites you have encountered while researching your topic, and complete this critical analysis using the Evaluation Worksheet. The goal is for you to demonstrate your

proficiency in evaluating information and recognizing the bias of authors.

Annotated bibliography

For this assignment, students are given the following instructions by Demers, both verbally and through the course Web site:

> Prepare an annotated bibliography containing all the materials you have been able to acquire, or are planning to acquire (have requested) regarding your issue. Break the list into section by type of resources used, for example, books (texts, symposium abstracts, reference books); magazine articles (journals: peer reviewed or popular press) Internet resources (least desirable, but acceptable – and very good for leading you to good resources). For each item provide 1. a complete citation. Also, annotate the bibliography by 2. evaluating the information provided. How will the information provided contribute to your research? (If you have not received it yet, how do you *think* it will?) 3. Evaluate the author and the publisher; consider what their bias might be and how it might influence what is printed.

In addition to compiling their own bibliographies, students are exposed to published bibliographies during the library training session and encouraged to use them in their research. Furthermore, the library's electronic databases are presented as a form of annotated bibliography. Malenfant hoped that this would both demystify the databases a little as well as anchor them in the tradition of printed research tools (e.g. McGuigan, 2001, p. 43).

Beginning in the summer of 2001, Demers began surveying her students' attitudes about information literacy as well as their perceptions of their own library skills. The results are summarized in Figures 1-4.

Figures 1-4 illustrate a clear shift in student perceptions of their own information literacy from "fair-good" (before the training) to "good-very good" (after the training). The training definitely had a positive impact on these students.

Students surveyed overwhelmingly judged the training to be worthwhile. In the summer of 2001, 21 students (87.5 percent) found the training worthwhile, three students (12.5 percent) had mixed feelings, and no students found the training to be not worthwhile. In the fall of 2001, 16 students (94 percent) found the training worthwhile, no students had mixed feelings, and one student (6 percent) found the training not worthwhile. In the fall of 2002, 21 students (91

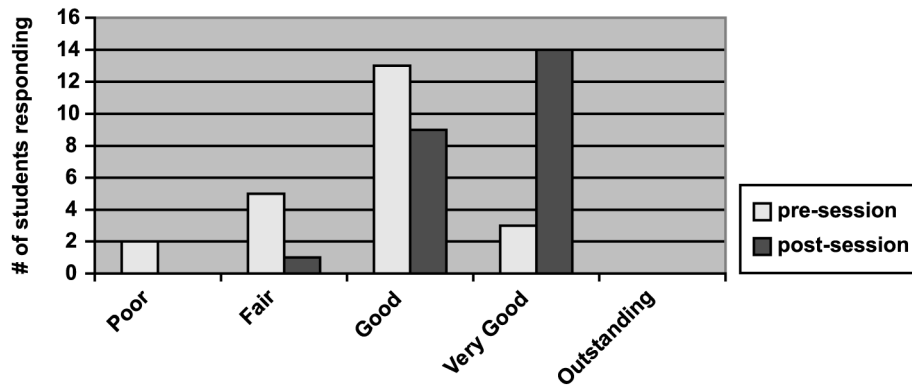**Figure 1** Student perceptions of their own information literacy, summer 2001

Figure 2 Student perceptions of their own information literacy, fall 2001
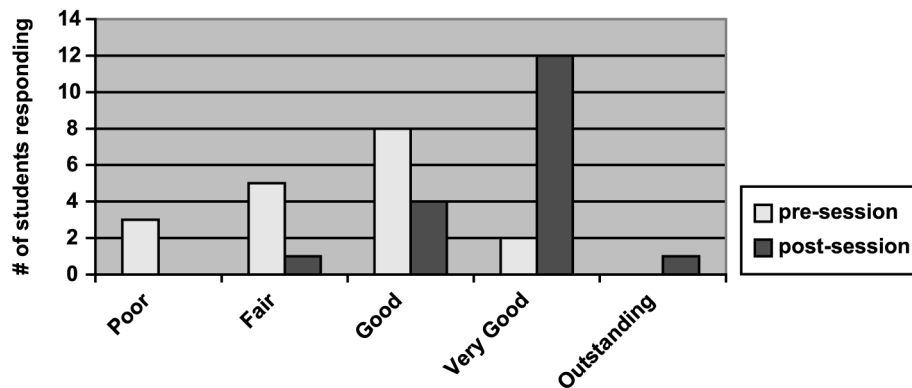

Figure 3 Student perceptions of their own information literacy, fall 2002
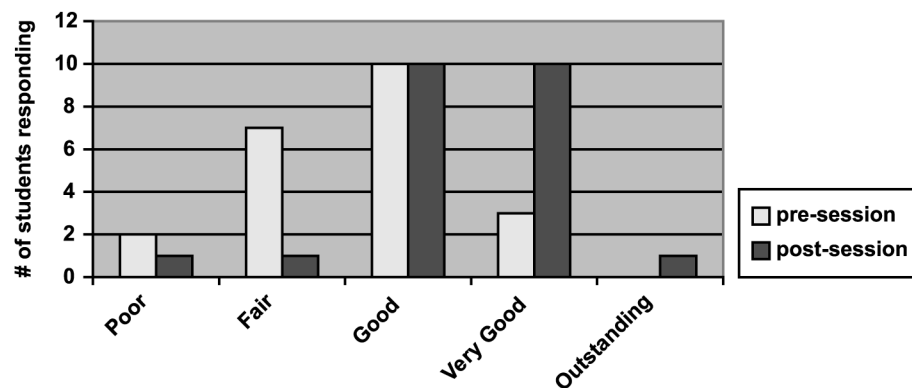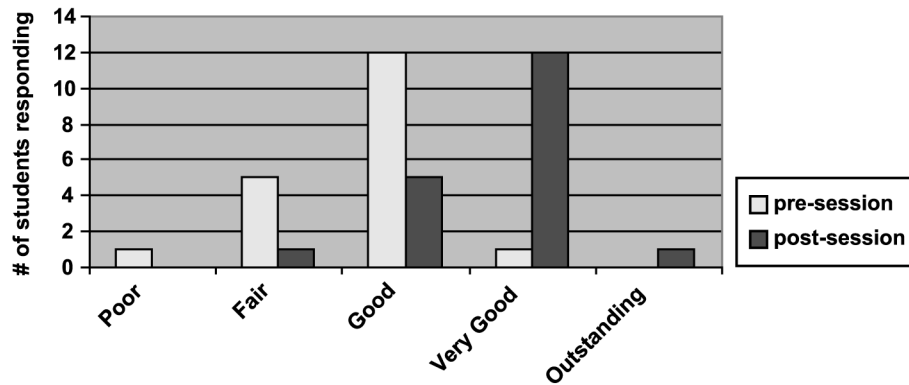
Figure 4 Student perceptions of their own information literacy, spring 2003

percent) found the training worthwhile, no students had mixed feelings, and two students (9 percent) found the training not worthwhile. In the spring of 2003, 18 students (95 percent) found the training worthwhile, no students had mixed feelings, and one student (5 percent) found the training not worthwhile.

Written comments were also solicited from the students. They show that while some students had a great deal of confidence in their ability to use the library before the training session, they also felt the advanced library training session was beneficial in improving their ability to navigate and utilize the wealth of library resources. Students recognized that their ability to process information had been improved, and several expressed a new-found appreciation of the importance of understanding science and technology in our rapidly changing world. These students, who are majors in arts, humanities, communications, theatre, environmental studies and science, became more confident in their ability to understand and evaluate scientific information.

Some students expressed that they had improved their skills in finding and evaluating resources both in traditional libraries and through the Internet. The skeptical nature of the scientific inquiry has been demonstrated and achieved, as demonstrated by improvements Demers perceived in the quality of the work submitted for grading.

When asked what they gained from the course, some students replied they were more aware of current events and more skeptical of the information being offered. They realized the bias present in material and how important it was to know about those various perspectives when attempting to understand the issues. When asked what they learned the most about, many mentioned their improved ability to use a variety of information resources, and the variety and number of technologies available for them to research their topics. They also recognized the importance of

historical and societal in influences in shaping information and technology.

These results are similar to Fox and Weston's (1993) findings of students' self-reported confidence in their searching abilities. Fox and Weston found that actual results, however, fell below students' reported success rates (pp. 91-5). Kohl and Wilson (1986) raise similar questions about the limitations of students' self-reported confidence in their own information literacy.

The current project, however, embodies several important differences from Fox and Weston's, and has more in common with the "cognitive" model Kohl and Wilson describe. The project was not limited to a one-time instructional session: rather, Demers' committed involvement meant that information literacy skills were examined throughout the semester. Demers and Malenfant did not test specific search techniques, such as the ability to use a particular CD-ROM product, but rather attempted to meet their information literacy objectives by teaching about the research process itself, and hoped that their instructional program would have an impact on the students' grades. Demers and Malenfant agree that, because Demers assigned points to the assignments that would be reflected in the students' grades in the course, students may have taken the information literacy training more seriously, paid closer attention to Malenfant, and been more inclined to view the training as worthwhile than if Malenfant had been just a guest lecturer.

As the collaboration progressed, it became obvious to Demers that in order for the information literacy goals to better be achieved, and in order to encourage timely completion of the assignments as well as an investment by the students in the quality of their own work, each assignment needed to have increasingly more graded value in class. Some students initially considered the assignments "busy work", and

apparently failed to understand the importance of the process in contributing to their education.

One reason for this may be because of the number of small assignments, that some assignments had no value, and the relatively low value of other assignments individually. (In written evaluations, some students admitted that they were not used to taking an entire semester to complete a research project, but rather usually waited until the last few weeks to "throw something together".) As the class has evolved, the value of these "scaffolding" assignments has increased from less than 35 percent to up to 60 percent of the course grade (http://ruby.fgcu.edu/courses/ndemers/10802/) in the hope that students will take the steps in the process of acquiring and evaluating information more seriously.

It is an understanding of the research process that is the true goal of the library instruction, not the final product. Additionally, as each semester's assignments were submitted, Demers was able to modify assignments and their due dates based on information acquired when the students visited the course Web site (McKnight and Demers, 2003). The process of improving the assignments, handouts and training sessions according to students' performance has been a development of Boyer's (1990) model of scholarship.

One specific example of this process is the evolution of the research plan worksheet assignment. The research worksheet is distributed during the advanced library training session. The students are told that they should practice the skills demonstrated during the training session and apply them to their specific issue in their own time, making notes about sources they have checked, search strategies they have tried, etc., on the worksheet.

The first time the worksheet was used, there was no grade assigned. They were due, at first, two weeks after the training session. As the worksheets were turned in, it was clear that some students were not taking full advantage of the opportunity to apply the strategies demonstrated for them. The students eventually told Demers that they were not sure of its importance, or how it related to the class. So, the following term, since the Web site access data showed that the students were not accessing the assignment information or worksheet until the night before it was due, the due date was moved up to a week after the training session in the hope they could better connect the two events.

Additionally, the point value assigned to the worksheet – and two of the other regular assignments – has increased. The research plan, once worth 3 percent of the final grade, is now worth 5 percent. Evaluating Web sites, once worth zero percent of the final grade, is now worth

5 percent, and the annotated bibliography, once worth 4 percent of the final grade, is now worth 8 percent

These changes have helped improve the quality of some students' work. The next step was to modify the worksheet to more explicitly request specific items the students could include which would demonstrate they had used the behaviors that were modeled in the training session to acquire the valuable resources which would help them research their topic.

For instance, instead of saying "databases to check", the revised worksheet asks for "databases that were checked", "titles of books to check out", and "the URLs of Internet sites to evaluate". In the future, the worksheet will be revised further, asking for the complete citation of a specific number and type of resources from the different sources that were shown in the training session (reference books, annotated bibliographies, inter-library loan books, databases, etc). This will ensure that the students are quickly on their way to acquiring the material they will need by requiring that the students practice each of the skills Malenfant demonstrates for the class.

This should also help prevent the situation that sometimes occurs when a student approaches Demers several weeks into the term claiming that "no material" is available on his/her chosen issue. Usually, this is because the student has incorrectly or half-heartedly completed the research worksheet assignment.

This sort of detailed assessment develops into a separate rubric that can be accessed on the Web page at any time. Although still fairly new to some students, rubrics help clarify exactly what the faculty member expects, and help remove any question on how the grades are assigned.

It is this same process of feedback from students about assignments, and discovering when they are accessing the course Web page to find out when assignments are due, that has led to the evolution of new assignments such as "mining resources" and "data and information".

These assignments require the students to provide evidence that they have accessed and evaluated a variety of resources on their topic. These assignments are intended to help them gain proficiency in demonstrating their skill in skeptical inquiry and improve their ability to provide a well-presented argument to support their stance in their final presentation. As the communication continues between Demers and her students, the wording of the assignments and the rubrics evolves in the hope that the process improves their competencies even more. After all, the assignments are the avenue to help them practice the skills that are important for future use.

Another evolution of assignments that would improve student success with the Tier II information literacy goals would be to require students to sign up for a "My librarian" one-hour, individualized research assistance session (with point value assigned, or, perhaps, as extra credit). This is an outstanding resource offered by the reference librarians that is currently "strongly encouraged" by Demers, but not required.

Although Demers and Malenfant both tell students repeatedly that consulting the experts (i.e. the reference desk staff) is one of their best uses of time, many students still seem wary of approaching the reference desk, feeling they should know how to use the library on their own (e.g. Jiao and Onwuegbuzie, 2000, p. 45, 1999, p. 279).

Unfortunately, many have not practiced library skills often enough to become proficient, and an hour session with a reference librarian would teach them far more than the hours they spend alone, as, they report, "struggling and frustrated" because they can find no information on their topic. Since one of the goals of the course is to help improve information and technology literacy, it appears that only by requiring these sorts of interactions can we be assured that the students will be able to practice them and learn the correct techniques to assess and evaluate the ever-burgeoning material in this day of information overload.

Hopefully, this will help to forestall students from turning to the search engines available through the Internet and missing out on so many valuable (and expensive) resources available through their university libraries (e.g. McGuigan, 2001, p. 40).

Collaborating across disciplines

Throughout the course of the project, Demers and Malenfant have attempted to remain flexible and accommodating to each other's goals. Demers, for example, gave up time that she could have spent performing research directly related to her field to work with Malenfant outside of class, and Malenfant adjusted his goal to produce a three-hour instructional session to fit the 90 minutes of class time Demers was willing to share with him. In the end, however, both feel the collaboration has been overwhelmingly worthwhile and successful. Among other benefits, Demers has documented improvement in her students' work, and Malenfant has gained semester-long involvement in a number of "Issues in ..." courses and the incentive for student involvement that only graded assignments can give.

Conclusions

In addition to continuing to work with Demers in her courses, Malenfant has begun to use many of the same materials in other instructors' sections of "Issues in Science and Technology" as well as in other "Issues in ..." courses, including "Issues in Ecology and Environment" and "Issues in Media, Literature, and Arts". Additionally, several of the handouts developed by Malenfant and Demers are now also available at the library reference desk for adapted use in one-on-one instruction.

Although he has not administered the survey tool that Demers developed for their pilot in other instructors' sections of the course, Malenfant does distribute the standard instruction evaluation form developed for general use by the library. The responses students write in the "comments" area mirror those gathered by Demers, notably an appreciation for the content and questions as to why they were not exposed to this kind of instruction earlier.

The answer, of course, is that they were. As described above, the library exposes students to a wide variety of instructional materials beginning right from their enrollment as freshman through the "Search for the Skunk Ape" program, basic library training, Web tutorials, course-integrated instruction, and more.

Malenfant and Demers' interpretation of this commonly posed question is that these instructional materials are appreciated because they are being presented to upper-division students who are at their point of need: as upper-division students moving forward in their majors, they are being assigned larger research projects with increasingly stringent requirements, and they are beginning to realize that their academic success depends on the ability to perform library research. Because of this, they may be seeing a value in library instruction that incoming freshmen, to whom it is all an abstraction, may not see.

The Skunk Ape tutorial and basic library training are valuable services offered by the library. They are well received by highly motivated students who have the time to commit to these activities. But it is course-integrated instruction like the project described here that is more successful in helping upper-division students achieve the information literacy goals shared by the library and the College of Arts and Sciences. As the public education system continues to become ever more dependent on grades to reward our students, it becomes increasingly necessary for each course to build class assignments addressing information literacy goals with increasingly advanced competencies to best achieve information and technology literacy.

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