Using Peer Mentors to Promote Information Fluency: Final Report

by Jeff Overholtzer and John Tombarge

In winter 2002, Washington and Lee University piloted a program to promote information fluency among students. The program integrated information fluency instruction into the curriculum of Quantitative Models for Management and Economics, a multi-section, research-intensive course, using peer mentors, a web site and online tutorials as the primary resources.

Background

The program originated in a series of discussions in committee meetings and a teaching and technology roundtable. During this process faculty members, librarians, technologists and other stakeholders at Washington and Lee University, a selective liberal arts university with about 1800 undergraduates and 400 graduate law students, discussed what information fluency means and how undergraduates should be taught information fluency skills. In addition, the authors and others from Washington and Lee participated in conferences sponsored by the Associated Colleges of the South, a consortium of 16 liberal arts institutions, on the subject of information fluency.[1] The following findings, among others, emerged from the discussions:

- Information fluency includes these factors: thinking critically about the information needed; understanding the structure and types of information in a discipline; finding information to meet specific needs, using search engines, bibliographical databases and other tools as needed; evaluating the quality of information found; analyzing the information, using of electronic spreadsheets, statistical analysis tools, and others as appropriate; and presenting the information, selecting from among electronic and other media as appropriate.[2]
- Specific concepts and skills that students need vary somewhat among disciplines. Quantitative analysis tools are helpful for Management students, but perhaps not essential for French majors.
- It is often desirable to teach students information fluency skills as part of courses already in the curriculum so that those skills can be applied to "real" problems. Our experience in teaching workshops confirmed that students learn best when skills are taught in context. For instance, students quickly forget their skills in developing Web sites or performing research with Web databases if they can't apply those skills in a course that requires their use.

An opportunity to apply these findings came in the fall of 2001, when W&L received a $4,200 grant from the Associated Colleges of the South. The grant, jointly sought by Management Professor Philip Cline, Reference Librarian John Tombarge and Director of Technology Education Jeff Overholtzer (hereafter referred to as the project coordinators). The grant paid for student mentors and other resources in support of Cline's Economics/Management 203 course, Quantitative Models. The course was well suited for the project.

First, the course is information-intensive and demands a variety of skills in using software and data analysis. Students work in teams on research projects that culminate in a paper as well as an oral presentation, typically accompanied by a PowerPoint presentation. They use quantitative analysis software such as Microsoft Excel and Minitab as well as survey software.

Second, students in the course are required to pursue a rigorous program of research, writing a review of the literature, formulating a research question or hypothesis, collecting data, and performing statistical analysis to test the hypothesis.

Finally, the course provides access to a significant number of students. Quantitative Models is required for students majoring in accounting, economics and management, enrolling about 160-180 students a year. Thus, information fluency instruction provided in this course affects over the long term most of the students in Washington and Lee's Williams School, which comprises the disciplines of economics, politics, management and accounting, justifying the investment of time and money in the program. This pilot program provided assistance to Professor Cline's three sections of Quantitative Models, about 60 students. These sections were taught during the 2002 winter term (January-April).

Prior to the pilot program, Professor Cline had incorporated some technology and research training into his curriculum with the assistance of technologists and librarians. But providing this assistance was taxing to everyone involved and diverted of the focus of the course from statistics concepts. The ACS-funded peer mentors program provided a scalable way to give more thorough and effective assistance in information fluency to all students in the course, without diluting other course content.

Goals

In summary, the goals of the program were to:

1. Use the resources of the information fluency program -- students, the info.wlu.edu Web site and the on-line Element K tutorials -- as resource- multipliers, providing more extensive support and information than what a faculty member, technologist and librarian could provide in-person.
2. Teach all the students in the course, in a more effective and efficient way than had been possible previously, the following information fluency skills and concepts:
    2.1. Applying critical thinking skills to research
    2.2. Learning about issues regarding copyright, ethics, and citing sources
    2.3. Selecting and evaluating resources
    2.4. Learning database structure and searching skills
    2.5. Using Internet sources
    2.6. Locating and retrieving statistical data
    2.7. Mastering Excel: basic skills, statistical tools, creating graphs and charts, importing data.
    2.8. Presenting information: selecting appropriate media (such as PowerPoint or World Wide Web); learning to use presentation tools following principles of effective visual display of information
3. Provide a model for teaching students information fluency skills that could be adopted in other information- and research-intensive courses.

The peer mentors were at the heart of the program. The four students selected for this role had completed the Quantitative Models course with distinction. In addition, they were proficient in software and research skills and had prior experience in teaching fellow students, having worked

in positions such as computing help desk worker and math tutor. We gave preference to juniors, so that they would be available to serve as peer mentors in the following academic year. We hired three juniors and one senior.

The peer mentors, trained by the project coordinators, could provide out-of-class assistance similar in quality, but in much greater quantity, than had been previously possible. A further advantage of using students to teach was that it meshed well with our perception of how students like to learn software. Survey results show that students prefer to learn software by informally consulting with their peers; they prefer this means to instructor-led workshops, on-line training and other methods by a significant margin.

The peer mentors were available to students in both formal and informal settings. They each held evening "office hours" for two hours a week in the computer-equipped library of the Williams School. These hours were posted on the Web site for the information fluency program. The peer mentors also led computer lab sessions, both during and outside of regular class times, on topics such as electronic spreadsheets and statistical analysis tools. In addition, these peer mentors were available for consultation by appointment.

Although they were already skilled in many of the requisite areas, peer mentors met with the three project coordinators at the beginning of the semester for review of software and research skills as well as statistics concepts. The peer mentors also used Element K on-line tutorials to hone their software skills as needed. The specific charge to the peer mentors was to provide assistance with software and research skills as they related to the assignments in Quantitative Models. They were also permitted to assist in communicating the statistics concepts in the course.

Another resource provided by the grant program was a Web site, http://info.wlu.edu. The librarian and technologist, assisted by paid students, constructed the site with information on research (including conducting a literature review, forming a thesis and using on-line databases and search engines) and the use of quantitative analysis, survey and presentation software. These topics were customized for the particular needs of the Quantitative Models course.

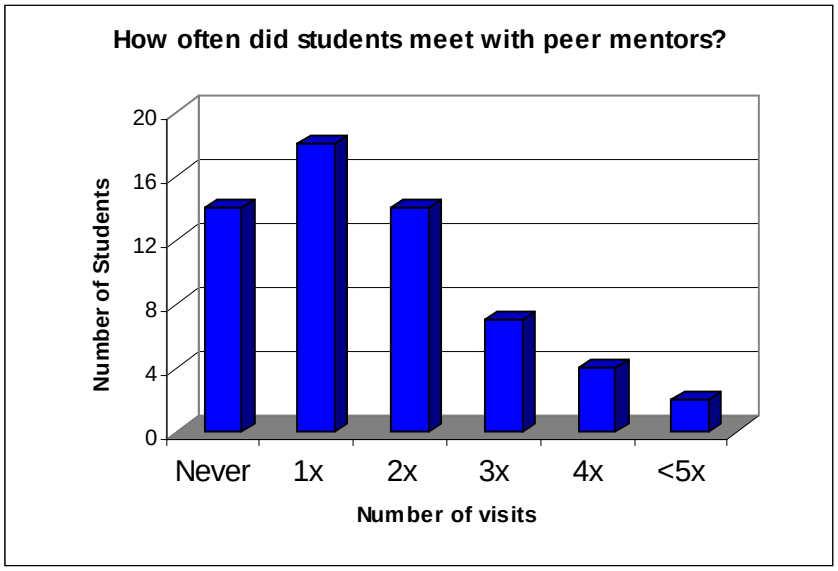
A final resource for the course, and one that did not require input from the project coordinators or the peer mentors, was Element K. These interactive, on-line tutorials licensed by the University provided on-demand instruction in the use of electronic spreadsheets, presentation tools and other software as needed by the students in Quantitative Models.

Use of support resources

To help assess the program, the coordinators asked students enrolled in the class to complete an evaluation survey at the end of the term that focused specifically on this project. The peer mentors also completed an evaluation survey, but in addition they wrote reports summarizing their activities and providing suggestions for improvements. The project coordinators expected that the two most popular components would be the peer mentors and the Web site that was developed to support the class project, but expected that use of these resources would be focused on the term project. Use of the peer mentors was the highest of any resource, with 76% of enrolled students reporting that they visited the peer mentors at least once. Students reported

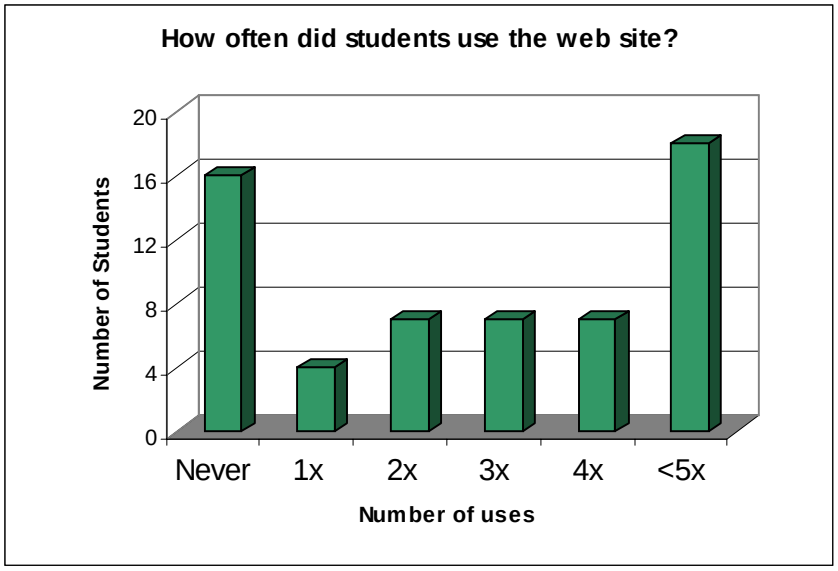
"meeting" with the peer mentors a limited number of times (see figure 1), but the peer mentors indicated that they answered a large number of questions through e-mail and chance encounters. The students may not have considered the e-mail and chance encounters as "meeting" with the peer mentors, so they may have underreported their use of the peer mentors in the evaluation. According to the peer mentors' reports, 39% of contacts occurred during office hours. E-mail accounted for 29%, chance encounters for 26%, and phone conversations 6%.

Figure 1



The Web site was the second most used resource, with 73% of the students reporting that they made use of the site. As figure 2 suggests, those that did make use of the Web site tended to visit it multiple times.

Figure 2

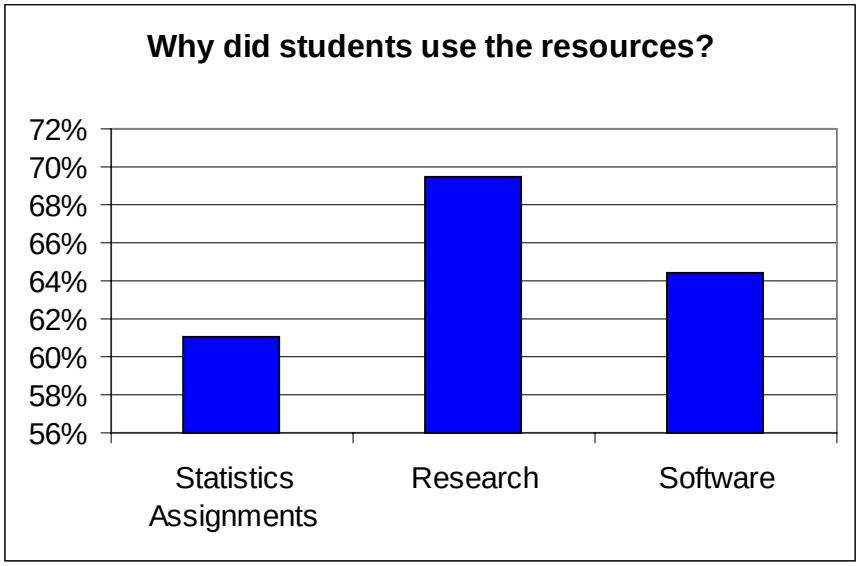


The difference in the use patterns between these two resources is interesting, but more notable is the number of students not using the resources. This trend was more striking for the librarian and the Element K tutorials, which received use by only 24% of the students. In previous terms, the librarian had devoted an overwhelming amount of time to helping students through the research and data analysis portions of the term project. This workload dropped to the lowest level ever, probably due to the participation of the peer mentors. As expected, students preferred going to the peer mentors and the Web site first. They preferred to approach the librarian only if they were unsuccessful in getting the help they needed. Unfortunately, many students seeking the librarian's help had selected topics on which it was difficult if not impossible to find sources of information. They often had to modify or change their topics. The professor noticed a similar drop in traffic during his office hours; those students that did come presented questions that were more substantial than he typically experienced.

The evaluations indicated that the students appreciated having the opportunity to get help in the evenings when they actually do their school work rather than being forced to get help only during the professor's office hours or during the librarian's scheduled hours. While the students appreciated the availability of help in the evenings, the peer mentors were not as "available" as the project coordinators would have liked. Peer mentors were asked to hold their office hours in the Williams School Library at one of the group worktables equipped with a computer, but these tables are very popular with students, who must work in groups for many of their classes. If there were no students present to help, the peer mentors often felt obligated to step aside and let other students use the limited group tables. This meant that on several occasions students seeking help could not locate the mentor.

The expectations of the project coordinators also affected the usefulness of the peer mentors. The peer mentors were expected to assist mainly with the term projects. The students enrolled in the class, however, expected the peer mentors to be fully involved and knowledgeable of the day-to-day activities in the classroom and to provide help with individual statistics problems. This expectation had not been considered and no communication link between the professor and the peer mentors about the classes' progress was put into place other than the peer mentors' having the syllabus. If a class seemed to be having trouble with a concept presented in class, the peer mentors were generally not warned, and they felt handicapped without this direct knowledge of what was happening in the classroom. Although the evaluations indicated that the majority of students sought help with research or software (see figure 3), there was a significant need for help with class assignments and the student comments indicated that although the peer mentors were quite knowledgeable about statistics, they would have liked the peer mentors to have been better informed about what was happening in the classroom.

Figure 3



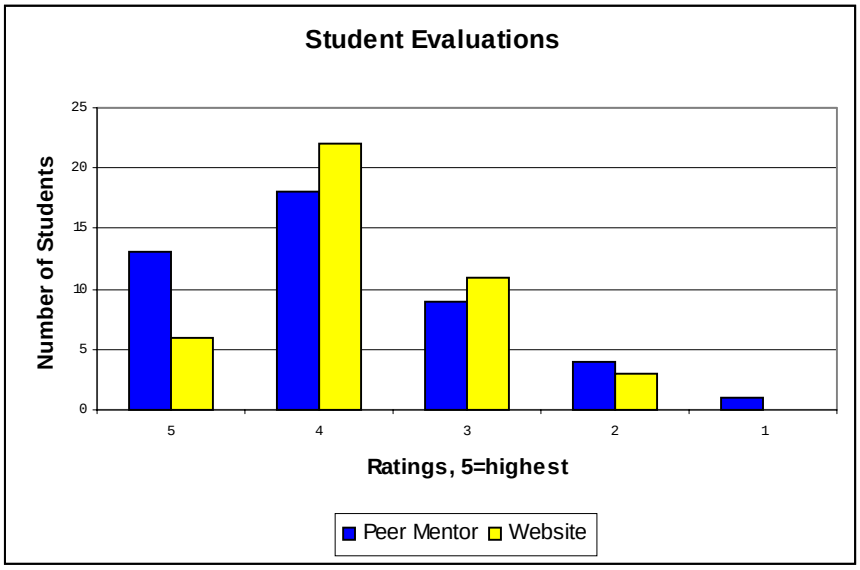
Project Assessment

Professor Cline summed up his assessment of the program with this statement: "The results in the final projects, the keystone of the course, were clearly superior -- there were no poor papers." While there was little difference in the quality of the projects at the high end of the grading scale, there was a marked difference at the lower end. He also noted that there was significantly less anxiety on the part of students at the end of the term than is usually the case. These differences he attributed to this project and especially the support of the peer mentors.

The students' self assessment of their skill levels at the beginning and the end of the term showed clear improvements in all skills covered by the project, with the most striking difference being in the use of Minitab, the statistical analysis software used in the class. Most of the students had never used such a program before. Although the students were comfortable with searching the Web, doing research, and using PowerPoint at the beginning of the term, significant improvement was evident in the students' self-assessment at the end of the term.

Their evaluation of the peer mentors and the Web site, which are shown in figure 4, indicates that the two resources made a valuable contribution to the course.

Figure 4



Student comments showed that students wanted both the peer mentors and the Web site to be better tied to the course content. The mentors should be more aware of what was happening in class, and the Web site should give examples of projects. Evaluations validated that the peer mentors were the preferred source when students wanted help. The peer mentors were available where and when the students did their schoolwork and were the highest-rated resource on the evaluation.

Improvements in the program suggested by the peer mentors and students in the class included:

- Better communication between the participants, especially the peer mentors and the professor.
- Post more examples in the Web site of successful term projects.
- Hold the peer mentors' office hours in a private area, such as a classroom equipped with a computer, rather than in the busy environment of the library.

The project coordinators also recommended that the Web site be developed within a course management system rather than as a specialized Web site. This would increase their ability to communicate with the students as well as to restrict the availability of some information (such as peer mentors' home phone numbers) to only those students enrolled in the course. It would also allow the various supporting Web pages to be more modular in nature so they could be mixed and matched with those of other classes.

The project coordinators also determined that the more individual assignments should be integrated into the course curriculum to better evaluate student progress in learning the skills. This first attempt at integrating information fluency components into this course increased the confidence of all participants that it is not only a worthwhile goal, but also is essential to adequately preparing students for their upper-level courses.

Conclusion

This pilot project will continue in 2003 with local funding. A new professor will join the project in the winter term of 2003, and the program will incorporate the identified improvements at this time. Other professors that teach Quantitative Analysis have also indicated their interest in the program and will be added in the next academic year.

The method of incorporating the instruction of information fluency skills in the Quantitative Analysis class at Washington and Lee offers a scalable model for supporting this instruction in other research-intensive courses. This model allows the skills to be taught within the context of a discipline in a way that matches how students like to learn. It also allows for the instruction to be provided without overwhelming support personnel.

End Notes

1. See <http://www.colleges.org/~if/> for details.

2. Adapted from L.A. Goetsch and P.T. Kaufman, "Readin', Writin', Arithmetic, and Information Competency," *Campus Wide Information System*s, Vol. 15, No. 5, 1998, pages 158-163.