Introduction to Engineering
All students majoring in engineering or engineering technology at UNC Charlotte are required to take the course Introduction to Engineering: Practices and Principles during their first semester in the program. The course is designed to introduce students to different disciplines within engineering, as well as professional skills like engineering design and calculations. It encourages academic, personal, and professional development, through assignments designed to foster teamwork, project planning, and oral and written communication skills.

Library Workshops
All students in this class are invited to attend a library workshop and receive extra credit on the related project report. Since over 25 sections of this course are offered each fall, the workshop format was developed as an alternative to traditional library instruction.

Collaboration
Although anecdotal feedback and surveys were uniformly positive, the librarian and instructors agreed that close collaboration was needed to determine if the workshops had the intended effect. Working together to develop a rigorous evaluation of the program, they planned a study to compare the quality and relevance of citations in projects submitted by students who attended the workshops with those who did not. By touching base after each semester, the team was able to discuss and refine how assignments posed research questions to the students.

Citation study
The pilot analysis showed that students who attended a workshop were generally more successful at source selection than those who did not, but that they still relied heavily on sources that the instructors and librarian agreed were inappropriate for college level research. In fall 2011, students who attended a workshop used a smaller proportion of unreliable websites, but still heavily cited inappropriate websites as well (see Figure 3).

In spring 2012, workshop attendance correlated with use of a larger variety of sources. All papers that cited an article or a standard had at least one student attend a workshop, while groups with no one attending used only books and websites (Figure 6).

Redirection
After reviewing the results of the first study and discussing the resources cited in the students' final projects, the team determined that the workshops should spend more time on conceptual ideas like avoiding plagiarism, proper citation, and credibility of sources, rather than focusing on library tools and search strategy.

While students were always offered five points of extra credit for attending the workshop, the instruction team decided to offer an extra bonus: students took a short quiz at the end of the workshop, which provided up to five additional points of extra credit. This allowed the team to evaluate the students’ behavior during the workshop, as the quiz required them to submit citations of material found, with a brief explanation of why the item would or wouldn’t be a credible source for this paper.

Challenges & Conclusions
The primary challenge in conducting this study was the time-intensive nature of citation analysis. In future semesters, the team plans to develop a grading rubric to be administered by the teaching assistant who grades the project reports already, with a rubric and scoring component that will give actual academic consequences for the students’ use of information resources.

Additionally, the librarian will work with the Center for Teaching and Learning on campus to develop online modules that introduce appropriate sources for each assignment in the course, possibly using a Moodle site to conduct automatically graded quizzes for the class.

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Further reading

Figure 1: Prototype testing: Beam Design project
Figure 2: Research guide for the Beam Design project
Figure 3: Use of reliable and unreliable websites by students attending or not attending a workshop
Figure 4: Variety of sources used by students attending or not attending a workshop
Figure 5: Students attending a workshop who cited the source they find
Figure 6: Students attending a workshop who evaluate the alternative to traditional library instruction.