

# **Collaboration for Quality: a Partnership to Assess Information Literacy instruction for Freshman Engineering**

**Scholarship of Teaching and Learning Grant Proposal**

**November 2012**

**Alison Bradley**

**Information Commons, J. Murrey Atkins Library**

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Abstract:

For several years, students in the required freshman course Introduction to Engineering (ENGR1201) have been offered the option of attending a voluntary library research workshop and receiving extra credit on their related project. Since hundreds of students in over 20 sections take this course each fall, the workshop format was developed as an alternative to traditional in-class library instruction, which is not practicable on this scale.

Although post-class surveys provided positive feedback about the value of the workshops, instructors for ENGR1201 saw a continuing heavy reliance on inappropriate reference sources in student work submitted. To better assess how the workshops were serving the students in these large classes, a group of freshman instructors and their subject librarian designed a citation study to evaluate the quality and variety of sources cited by students who attended a workshop versus those who did not. After the pilot study was completed, the instruction team and the librarian worked together to revise assignments and discuss ways of providing support to all students enrolled in Introduction to Engineering, including tools like online research guides and video tutorials played in class or embedded in course management software.

While the initial study of a small sample of student work provided useful insights, grant funding would allow the team to expand the study to include additional sections of the course and to review historical data to improve teaching and learning of research skills and to determine any effects on student retention, progression, and academic success.

## Budget Request for SOTL Grant Year 2012-13

Joint Proposal?  Yes  No  
 Title of Project **Collaboration for Quality: a Partnership to Assess Information Literacy instruction for Freshman Engineering**  
 Duration of Project January 2012 – June 2013  
 Primary Investigator(s) Alison Bradley, Dan Latta, Meg Harkins  
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UNC Charlotte SOTL Grants Previously Received (please names of project, PIs, and dates) **Strengthening Students' Research Skills through Librarian-Faculty Collaboration, October 2011, Stephanie Otis, Dawn Hubbs, Alison Bradley, Heather McCullough,**

Allocate operating budget to Department of J. Murrey Atkins Library

Account #	Award	Year One January to June
Faculty Stipend	Transferred directly from Academic Affairs to Grantee on May 15	\$ -
911250	Graduate Student Salaries	\$2,500
911300	Special Pay (Faculty on UNCC payroll other than Grantee)	
915000	Student Temporary Wages	
915900	Non-student Temporary Wages	
920000	Honorarium (Individual(s) not with UNCC)	
921150	Participant Stipends	
925000	Travel - Domestic	\$2,500
926000	Travel - Foreign	
928000	Communication and/or Printing	
930000	Supplies	
942000	Computing Equipment	
944000	Educational Equipment	
951000	Other Current Services	
<b>GRAND TOTAL</b>		<b>\$ 5,000</b>

**Attachments:**

1. Attach/provide a narrative that explains how the funds requested will be used.  
Graduate Student Salary: \$2,500 is requested from the SoTL grant program to be used to hire a graduate student at a rate of \$12/hour for an estimated 15 hours per week in spring 2013. Hiring this student will allow the research team to expand the scope of our pilot initiative to cover additional sections during the current academic year, and also to evaluate existing data from previous semesters. The student will be trained to review and score the citations used by students in their coursework for completeness of citation and variety and authority of sources. Hiring this student will allow the team to study additional sections of the class, and also to create a retrospective assessment of sections from the past three years.  
Travel funding: \$2,500 is requested to support travel for the three investigators to present their findings at the annual conference of the American Society for Engineering Education in Atlanta, GA, June 2013, where an abstract describing this project has already been submitted and accepted as a Work-in-Progress paper for presentation pending peer review of our final draft.

2. Has funding for the project been requested from other sources?  Yes  
 No. If yes, list sources.

Additional support for travel has been requested and secured from Atkins Library and from the College of Engineering's Office of Student Development and Success.



UNC CHARLOTTE

J. Murrey Atkins Library

**Library Administration**

9201 University City Boulevard, Charlotte, NC 28223-0001  
t/ 704-687-2030 f/ 704-687-3050 <http://library.uncc.edu>

November 6, 2012

Dear SoTL Committee Members,

I would like to express my strong support for the library instruction/Engineering 1201 grant application you are currently considering. Assessing the effectiveness of this library intervention is worth doing in its own right, but I think it is particularly timely in how this effort relates to the Library's general assessment efforts.

I have great confidence in Alison Bradley's ability to manage this work, and we can commit to providing her with any support she might need to make it a success. What's more, if this project produced a working model, we would expand it's scope, and adapt it to other areas.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stanley Wilder".

Stanley Wilder



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

Office of Student Development and Success

9201 University City Blvd, Charlotte, NC 28223-0001  
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October 25, 2012

UNC Charlotte  
Center for Teaching and Learning  
Scholarship of Teaching and Learning Program  
SOTL Grant Selection Committee

Dear Selection Committee Members:

I am delighted that our freshman engineering faculty have partnered with the University Library to enhance the research skills of our students. The ability to identify *credible* reference sources, evaluate *relevant* information, *analyze* and *synthesize* research findings, and *communicate* those findings in a coherent and cohesive manner is fundamental to success in our profession. Helping our freshmen understand the value of and what constitutes “good research” lays a strong foundation early in their career.

The project team submitting this proposal has a track record of success. They took the initiative to conduct a pilot study (unfunded) that has shown promising preliminary results. An SOTL grant will enable them to expand their study in terms of scope and in terms of the number of students they reach. This fall more than 550 new freshmen enrolled in the Lee College which represents a 32% increase from fall 2011.

I enthusiastically support this project and will do what I can to ensure its success. I am confident that it will provide useful insights for enhancing teaching and learning of our freshmen engineering students.

Sincerely,

A handwritten signature in black ink, appearing to read "Patricia A. Tolley".

Patricia A. Tolley, Ph.D., P.E.  
Associate Dean for Undergraduate Experiences



## **Project Narrative**

### **A: Specific Aims**

#### **1. The specific objectives to be achieved:**

- A. Providing research instruction to a large course across multiple (20+) sections in a voluntary workshop format
- B. A summative assessment of the workshop model of library instruction, through citation analysis of bibliographies created by students who attended a workshop as compared with those who did not
- C. Creation of stronger research assignments and a more effective library instruction program for ENGR 1201 through collaborative evaluation and discussion of student work by the subject librarian and the course instructors
- D. Collaborative development of specific learning outcomes for assignments requiring research and for library research instruction in ENGR 1201
- E. Sharing of this replicable model with other librarians and instructors both on campus and nationwide

#### **2. The specific research questions to be answered as a result of the project**

This project will answer the question of whether a combination of voluntary workshops and librarian/instructor collaboration can help large numbers of incoming freshman students develop stronger research skills within their discipline.

#### **3. The rationale for the proposed project**

For several years, students in Introduction to Engineering (ENGR 1201) at UNC Charlotte have been offered the option of attending a library workshop and receiving extra credit on their related project report. Since several hundred students in multiple sections take this course each fall, the workshop format was developed

as an alternative to traditional in-class library instruction, which is simply not practicable on this scale. Although anecdotal responses and post-class surveys have given positive feedback, a more comprehensive assessment was needed to determine whether the workshops were having the intended effect. Librarians and faculty members worked together to create a rigorous evaluation of the program which compares the quality and relevance of citations in projects submitted by the students who attended the workshops with those who did not. Papers are selected by course section to create a fair basis of comparison between the control group who did not attend a workshop and the students who did attend. Since this is a large course with many sections taught by multiple instructors, comparing students within individual sections will help ensure that they have received the same instructions and guidance regarding the assigned work, apart from their participation or non-participation in the library workshops. The assessment of the sources will include number of sources cited, types of material (article, website, book, etc.), and reliability of source. Results of the analysis will be shared and discussed amongst the co-investigators and with other ENGR/ETGR 1201 instructors to help plan for future iterations of the course and the library workshop program.

The proposed project is an extension of a successful pilot study conducted over the 2011-12 academic year. During Fall 2011, 485 students were enrolled in 19 sections of ENGR/ETGR 1201. 8 library workshops were scheduled, and 55 students attended. The workshop focused on selecting appropriate search tools, brainstorming keywords, and proper citation style. During Spring 2012, 239



students were enrolled in 19 sections of ENGR/ETGR 1201. 6 workshops were scheduled, and 66 students attended. The final project with citations was a group paper, so projects where one, some, all, or any students in the group attended were compared with projects where no students in the group attended.

In the initial pilot analysis, the study showed that students who attended a workshop were generally more successful than those who did not, but that they still relied heavily on inappropriate sources in their work. In the Fall semester, students who attended a workshop used a smaller proportion of unreliable websites, although they still cited large numbers of inappropriate sites (see Figure 1).

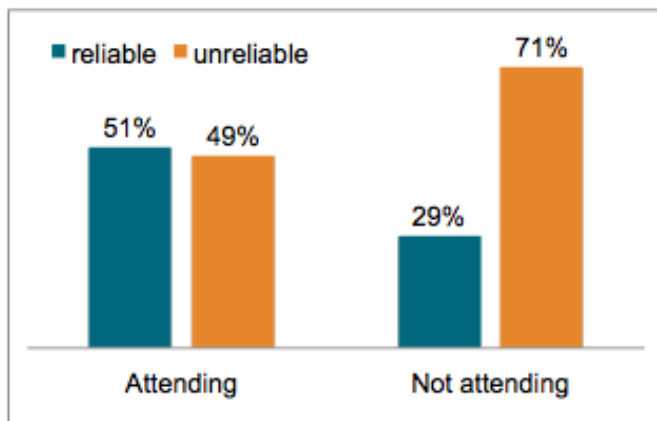


Figure 1: Use of reliable and unreliable sites

In the spring semester, 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 (see figure 2)

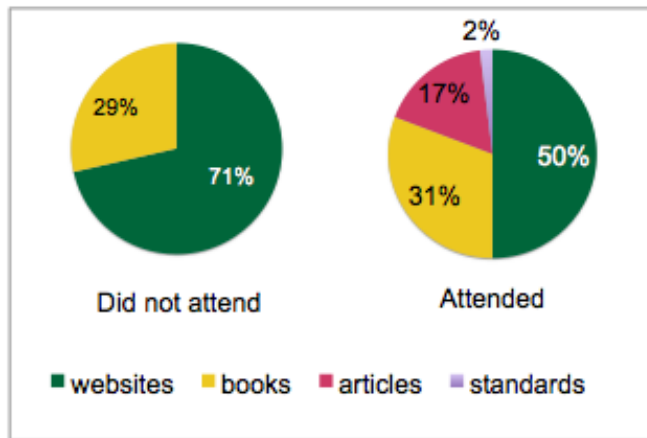


Figure 2: Variety of sources used

In the proposed expansion of this study, hiring a graduate student to conduct ongoing analysis of works cited and to evaluate past projects will create an expanded picture of the state of student research in this course over time, and will free up the librarian and the instructors to focus on discussing the results of the analysis and creating shared learning outcomes for student research throughout the ENGR1201 course. By establishing a formal set of learning outcomes, the assignments and the library instruction can more easily be coordinated to help students succeed with their research.

#### 4. **The impact of the study on undergraduate teaching and learning**

The problem of teaching ethical and appropriate use of information is an ongoing one for all educators. Developing a successful model for providing research skills instruction to large, multiple section courses could have an impact on undergraduate teaching and learning across campus, as the workshop model can be replicated for other disciplines. Although the citation analysis focuses on selected sections of the class (with about 75 students per semester being studied), the impact of the study is quite broad: it will affect research skills instruction for all

undergraduates majoring in Engineering, as they are all required to complete ENGR 1201 to proceed in the program.

## **B. Literature Review**

### **Citation Analysis as a tool of assessing research instruction**

Authentic assessment of student research skills is best achieved by examining their behaviors as demonstrated in their actual coursework. Several studies over recent years have used citation analysis of student work to evaluate the ability of students to select appropriate variety, types, and quantity of sources for use in assigned projects. Karen Hovde (2000) points out the strong benefit of citation analysis in providing “a demonstrable basis for the assertion that students are getting the instruction message”, while remaining relatively non-invasive. (Hovde 2000, p. 8) At Drexel University, Denick, Bhatt, and Layton (2010) found that citation analysis gave them strong insights into their freshman students’ grasp of appropriate research behaviors, and also highlighted some areas that could be covered more completely in library instruction sessions in the future. Sarah Clark and Susan Chinburg (2010) created a model for comparing groups of students who received differing types of research instruction within a single large-scale course, allowing others to adopt their model to compare a set of students receiving library instruction with a control group that did not. Finally, Virginia Young and Linda Ackerson (1995) developed a program to conduct bibliographic evaluation of large numbers of student papers by trained staff members, allowing a larger sample for evaluation than a single librarian or instructor could manage individually.

### **Collaboration between librarians and teaching faculty**

The professional literature in librarianship clearly illustrates both the need to help students develop their information literacy skills and the great potential for collaboration between instructors and librarians to achieve this goal. While traditional library instruction introduces students to the research process, having librarians collaborate with instructors to improve research-based assignments shows much stronger effects. Having librarians work with instructors on developing the assignment itself provides an essential opportunity to reach the students directly, as “students persistently focus on assignment requirements” (O’Connor et al 2010). Librarians can provide an important alternate point of view in developing assignments, since students often come to the reference desk for assistance with tasks that are unclear or confusing. (Kenedy and Monty 2011) Brown and Kingsley-Wilson (2010) describe a successful project where librarians worked with instructors to alter an existing assignment to encourage stronger research techniques, going from a scavenger-hunt style list of sources needed to more open-ended questions requiring critical thought and advanced search techniques.

## **References**

Brown, C., & Kingsley-Wilson, B. (2010). Assessing organically: turning an assignment into an assessment. *Reference Services Review*, 38(4), 536-556

Clark, S., and Chinburg, S. (2010). “Research Performance in Undergraduates Receiving Face to Face versus Online Library Instruction: A Citation Analysis.” *Journal of Library Administration* 50 (5-6) (August 10): 530-542.

Denick, D., Bhatt, J. and Layton, B.. (2010). Citation Analysis of Engineering Design Reports for Information Literacy Assessment.  
<http://idea.library.drexel.edu/handle/1860/3475>.

Hovde, K. (2000). “Check the citation: library instruction and student paper bibliographies.” *Research Strategies* 17 (1) (March): 3-9.

Kenedy, R., & Monty, V. (2011). Faculty-Librarian Collaboration and the Development of Critical Skills through Dynamic Purposeful Learning. *Libri: International Journal of Libraries & Information Services*, 61(2), 116-124.

Young, V. E., and Ackerson, L. G. (1995). "Evaluation of student research bibliographies: refining evaluation criteria." *Research Strategies* 13 (2): 80-93.

### **C. Methods**

1. The subject librarian and the instruction team will meet to establish learning outcomes for research assignments in the upcoming semester of ENGR 1201. These outcomes will be used to revise the text of the assignment and also to design the workshops and other forms of research assistance offered (online guides, short videos for class, etc.)
2. The subject librarian will create a scoring rubric for analyzing citations as submitted by students in the selected sections of ENGR 1201, and will train the graduate student on the accurate use of the rubric
3. The graduate student will score the reference lists of evaluated papers, and create sets of data to examine variation between the students who attended a workshop with those who did not
4. The subject librarian and the instructors will meet together to evaluate and discuss the findings of the citation analysis, and to use the findings to plan for future semesters.

### **D. Evaluation**

This project is in its essence an attempt to evaluate an existing program, and to develop an ongoing collaborative culture of assessment to support students' ethical and appropriate use of information. It uses the quantitative technique of citation

analysis to conduct summative assessments of student work, and develops a collaborative space to qualitatively discuss student results and instructor expectations for research ability in freshman engineering coursework.

#### **E. Knowledge Dissemination**

The results of this study will be shared nationally at the 2013 Annual Conference of the American Society for Engineering Education (ASEE), where an abstract describing the work in progress has already been accepted. Results will be shared on campus through departmental events and at CTL sponsored research fairs, and at regional library and engineering conferences as possible.

#### **F. Human Subjects**

This project was certified as exempt under category 1 (45 CFR 46.101) by the IRB on 11/9/2011 (protocol # 11-10-41) and received approval of exemption on 11/8/2012.

#### **G. Extramural Funding**

No extramural funding is currently being sought.

#### **H. Timeline**

##### **January 2013**

- Recruitment and hiring of graduate student
- Training of student to evaluate and code citations
- Research team meets to evaluate pilot project data and plan for spring 2013

##### **February/March 2013**

- Workshops offered for Spring 2013 sections of ENGR 1201
- Analysis of Fall 2012 and archived (2010 and earlier) citations begins

### **March/April 2013**

- Citation analysis continues
- Research team meets to review citation analysis results to date
- Final draft of paper written and submitted to ASEE committee for peer review

### **May/June 2013**

- Citation analysis of Spring 2013 papers completed
- Research team meets to discuss final results of analysis

### **June 2013**

- Attend ASEE conference and present accepted paper