Evidence Based Library and Information Practice

Completion of an Online Library Module Improves Engineering Student Performance on Information Literacy Skills Tests

A Review of:

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Abstract

Objective – To assess the efficacy of an online library module and of blended learning methods on students' information literacy skills.

Design – Multi-modal, pre- and posttests, survey questionnaire, and focus groups.

Setting – Public research university in London, Ontario, Canada.

Subjects – First-year engineering students.

Methods – Of 413 students enrolled in Engineering Science (ES) 1050, 252 volunteered to participate in the study. Participants were asked to complete the online module, a pretest, a posttest, an online follow-up survey, and to take part in a focus group.

Researchers generated a pretest and a posttest, each comprised of 15 questions: multiple choice, true or false, and matching questions which tested students' general and engineering-specific information literacy skills. The pretest and posttest had different, but similarly challenging, questions to ensure that students involved in the study would not have an advantage over those who had opted out. While all components of the study were voluntary, the posttest was a graded course assignment.

In-person tutorials were offered on 4 occasions, with only 15 students participating. Both tutorial and module content were designed to cover all questions and competencies tested in the pretest and the posttest, including Boolean operators, peer review, identifying plagiarism, engineering standards, engineering handbooks, search strategies, patents, article citations, identifying reliable sources, and how to read journal articles.

The posttest survey was delivered in the CMS immediately after the posttest was completed. It measured self-reported student behaviours and preferences concerning the online modules. Two focus groups were convened after all posttest surveys were completed to gather qualitative data about student preferences.

Main Results – Of the 252 volunteers, 239 students (57.9% of enrolled students) completed both the pretest and the posttest, 89 filled out the follow-up survey, and 7 students participated in a focus group. Students used the online module content differently; accordingly those numbers were not reported. Researchers compared pretest and posttest scores to find that the posttest scores were significantly higher than the pretest scores ($p < 0.001$). Of 239 pretest and posttest pairs evaluated, the mean pretest score was 10.456 and the mean posttest score was 13.843. A t-test survey and focus group data evaluated student perceptions of the module. Students reported a slight preference for online instruction.

Conclusion – After completing an online library module, students' performance on information literacy skills tests improved from the pretest to the posttest. Focus group and survey data indicate a slight student preference for online tutorials over in-person instruction. Although intended as a blended approach to library instruction, the voluntary in-person instruction was not well attended and has subsequently been changed to mandatory in-class instruction. The authors recommend further research to evaluate how the medium and format of instruction impacts student learning outcomes.

Commentary

Instruction librarians continuously evaluate how to efficiently and effectively deliver instruction to various user groups. A body of literature supports the convenience and efficacy of embedding online tutorials in course management systems (CMS), both to save the time of the librarian and to meaningfully contextualize and teach information literacy skills (Mery et al., 2012; Henrich & Attebury, 2012). These studies have found that embedded online tutorials have a positive impact on student learning. Here, by focusing on first-year engineering students, the researchers targeted a unique population.

The ReLIANT (Reader's guide to the Literature on Interventions Addressing the Need for education and Training) instrument provides librarians the means to critically assess educational and training interventions in library and information science (Koufogiannakis, Booth, & Brettle, 2006). This instrument was employed by the reviewer to evaluate the design, educational context, results, and relevance of the study at hand.

The authors do a good job of answering the first research question. However, the second research question is not adequately answered due to the absence of well-attended, in-person instruction sessions, and this presents a substantial design flaw. With only approximately 15 students receiving in-person instruction, this study does not assess blended learning methods. Some other elements of the methodology are problematic as well. No demographic information was collected and it is unknown if subjects were representative of the engineering department or the university's undergraduate population. Students were asked to complete a written consent form and a pretest during class, but posttests and surveys were conducted online and outside of class. The authors do not state whether the survey and the pretest/posttest content had been piloted. Had the content been piloted, pretest questions regarding the appearance of print publications and the difficulty level may

have been reconsidered.

The educational context and instructional topics are clearly defined and described. However the teaching methods employed and the mode of delivery are clouded by the authors' claim of measuring the effectiveness of "blended learning" methods. Additionally, the study neglects to offer any detail regarding how the module was integrated into the CMS and indicates that students did not consistently view all tutorial videos. In order to ensure equal instructional contact time, researchers might instead have worked with content creators to ensure that all tutorial content was mandatory.

The results of the study are well-explained with the data clearly presented and analyzed using SPSS. The resulting improvement in student information literacy levels cannot be attributed to blended learning methods. The authors acknowledge that they must incorporate more in-person instruction to create a truly blended approach. They describe how in subsequent semesters they have "flipped the classroom" and require students to complete modules before in-person classroom sessions.

This article's positive contribution to the literature lies in its evidence for collaborating with faculty, IT, and other stakeholders to create multimedia online content that can be conveniently accessed and integrated into a CMS. Instead of consulting this article for best practices on blended learning, librarians would do well to consult the practical sections on collaborating to develop and embed effective library instruction.

References

Henrich, K. J., & Attebury, R. I. (2012). Using Blackboard to assess course-specific asynchronous library instruction. *Internet Reference Services Quarterly*, *17*(3-4), 167-179. http://dx.doi.org/10.1080/10875301.2013.772930

Koufogiannakis, D., Booth, A., & Brettle, A. (2006). ReLIANT: Reader's guide to the literature on interventions addressing the need for education and training. *Library & Information Research*, *30*(94), 44-51. Retrieved from http://www.lirgjournal.org.uk/lir/ojs/index.php/lir/article/view/271/318

Mery, Y., Newby, J., & Peng, K. (2012). Why one-shot information literacy sessions are not the future of instruction: A case for online credit courses. *College & Research Libraries*, *73*(4), 366–377. Retrieved from http://crl.acrl.org/content/73/4/366