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# Effectiveness of Course-Integrated and Repeated Library Instruction on Library Skills of Education Students

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## *Abstract*

*Given the investment in librarian time and energy and faculty and student time constraints, it was deemed important to assess effectiveness of course-integrated library instruction, and more specifically, whether repeated library instruction has a cumulative effect on student learning. As such, students who began the study with no prior library instruction experience (n=45) were contrasted with students who had completed a library walking tour and worksheet (n=34) and with those who had attended previous course-integrated library instruction (n=27). A pre-test/post-test research design was utilized, with course-integrated library instruction as treatment. Analysis indicated a statistically significant difference (dependent $t(105)=2.18$, $p<.05$) between pre-test ($M=49.43$, $SD=19.24$) and post-test ($M=77.69$, $SD=14.64$) scores. However, an analysis of variance (ANOVA) revealed students with no prior library instruction experience did not significantly differ from those who completed a walking tour and worksheet or those who attended a prior course-integrated library instruction session ($F(2,103)=1.63$, $p=.20$).*

***Keywords :*** *Academic libraries; Library instruction; Evaluation; Cumulative effect*

## Introduction

Education faculty at the University of Central Florida often assign students an education-specific library walking tour and accompanying worksheet to be completed prior to attending a course-integrated library instruction session. As worksheet questions are open-ended, responses are reviewed and graded individually. Also, throughout the course of their academic careers students may attend more than one course-integrated library instruction session. Considering the time and energy necessary for delivering instruction and reviewing worksheets, and competition for student and faculty time, it was deemed important to investigate the effect of library instruction on student learning.

In this analysis, students who began the study with no prior library instruction experience were contrasted with students who had either completed a library walking tour and worksheet for education resources or who had previously attended a course- integrated library instruction session. Student scores on a brief library skills test were analyzed on the condition of repeated library instruction. This study specifically addressed the questions: Do student scores on a library skills test significantly improve after a single course-integrated library instruction session? And, do students who have experienced repeated library instruction perform significantly better on a test of library skills than students who have attended only one instructional session? Hypotheses for the study were:

* Student scores on a library skills test will significantly increase after attendance at a course-integrated library instruction session.
* Students with repeated library instruction experience will perform significantly better on a library skills test than students who have received only the single course-integrated instruction treatment.

## Research on Library Instruction Effectiveness

Academic libraries offer a variety of strategies for orienting students to the library and teaching them to use its resources and services more effectively. Pathfinders, walking and audio tours, workshops, credit courses, and increasingly, course-integrated library instruction are some of the instructional approaches reported in the literature. Course-integrated instruction in academic libraries generally employs a conceptual approach to the organization of information in a specific subject and is geared to the needs of a particular class.[1] Students are expected to gain an understanding of basic library search theory and be able to identify and use resources pertinent to their information need.[2]

A number of program descriptions and attitudinal studies have been reported, but far fewer studies have investigated the effect of library instruction on student learning or scholarly achievement. Librarians have been taken to task for failing to systematically and meaningfully evaluate library

1. L. M. Fox, & L. Weston, "Course-Integrated Instruction for Nursing Students: How effective? " *Research Strategies*, 11 **:** 2(1993) **:** 89-99;
   D. F. Kohl, & L. A. Wilson, "Effectiveness of Course-Integrated Bibliographic Instruction in Improving Coursework," *RQ*, 27(1986) **:** 206-211; and
   M. J. Tierno & J. H. Lee, "Developing and Evaluating Library Research Skills in Education: A model for course-integrated bibliographic instruction," *RQ*, 22(1983) **:** 284-291.
2. E. J. Farber, "Library Instruction throughout the Curriculum: Earlham College Program," In J. Lubans, Jr., (ed.), *Educating the Library User* (New York **:** Bowker, 1974), pp.145-162.

instruction programs,[3] and an analysis of library instruction articles published over a fifteen-year period corroborated that while the number of articles had increased, the percentage of research articles had not.[4] Program descriptions, bibliographies, and literature reviews continue to comprise the bulk of articles published in the field of library instruction.[5]

Several barriers to formal evaluation of instruction are described in the literature. Patterson and Howell reported that many librarian education programs do not offer classes on instructional methodology or assessment.[6] It has also been suggested that librarians may perceive formal evaluation as being too complex, too time consuming, or simply one more responsibility on an already excessive workload.[7] Further, no professionally recognized standards exist on what librarians should be teaching, or how they should be teaching it.[8]

Despite these challenges to instructional assessment, several interesting studies have been conducted examining the effect of library instruction on student learning. In their study of students enrolled in a psychology class, Daugherty and Carter reported that participants exhibited both improved attitude and skill development after attending a course-integrated, outcome-focused library instruction session.[9] Tierno and Lee also found students' attitudes toward library research and actual library research skills improved after participating in course-integrated library instruction.[10] A small number of other studies have likewise confirmed that group library instruction consistently produced library skills development and increased student learning outcomes.[11]

Of the body of published research investigating the scholarly impact of library instruction, only one study was identified that examined the effect of

3. For example, C. Bober, S. Poulin, & L. Vileno, "Evaluating Library Instruction in Academic Libraries: A critical review of the literature: 1980-1993," In L. M. Martin (ed.), *Library Instruction Revisited: Bibliographic Instruction Comes of Age* (New York: Haworth Press, 1995), pp.53-71;
T. Eadie, "Beyond Immodesty: Questioning the Benefits of BI," *Research Strategies*, 10(1992)：105-110; and
H. B. Rader, "A Silver Anniversary: 25 years of reviewing the literature related to user instruction," *Reference Services Review*, 28：3(2000)：290-296.
4. S. Edwards, "Bibliographic Instruction Research: An analysis of the journal literature from 1977 to 1991," *Research Strategies*, 12：2(1994)：68-78.
5. *Op. Cit*., Edwards.
6. C. D. Patterson & D. W. Howell, "Library User Education: Assessing the attitudes of those who teach," *RQ*, 26(1990)：513-523.
7. *Op. Cit*., Eadie.
8. *Op. Cit*., Bober, Poulin, & Vileno.
9. T. K. Daugherty, & E. W. Carter, "Assessment of Outcome-Focused Library Instruction in Psychology," *Journal of Industrial Psychology*, 24(1997)：29-33.
10. *Op. Cit*., Tierno & Lee.
11. For example, *Op. Cit*., Fox, & Weston; G. Franklin, & R. C. Toifel, "The Effects of BI on Library Knowledge and Skills among Education Students," *Research Strategies*, 12(1994)：224-237; and *Op Cit*., Kohl, & Wilson.

repeated library instruction. Replicated over a period of five semesters, Ackerson, Howard, and Young compared the quality of students' term paper bibliographies with the number of library instruction sessions students received.[12] A control group of technical writing classes received one library instruction class over the course of a semester, while the experimental group attended a total of four library instruction classes. Results generally indicated there were no statistically significant differences between scores assigned to the control group's bibliographies and those assigned to the experimental group. In only one semester were the scores between the two groups significantly different. The authors concluded that the amount of library instruction received by the students did not significantly influence the quality of their bibliographies.

As evidenced by growth in the number of articles published on the subject, there is increasing interest in the evaluation of library instruction.[13] However, in an era where librarians must demonstrate instructional effectiveness to compete for student and faculty time, or to determine the value of their own professional efforts, systematic evaluation of library instruction programs is rare.[14] Further, although a consensus exists that course-integrated instruction generally affects the scholarly output of students, the literature lacks sufficient data relating the cumulative effect of repeated library instruction to student learning outcomes.

## Method

The sample consisted of 106 masters, doctoral, and post-baccalaureate students (76 females, 30 males) enrolled in one of eight graduate-level Education classes. Students were expected to complete a comprehensive review of the literature as part of their class grade and were included in the study based on anticipation of receiving formal library instruction, permission from the instructor, and agreement from individual students to participate in the study.

To assess existing library skills levels a pre-test/post-test design was utilized. Each student completed a demographic survey and library skills test immediately prior to instruction and an identical library skills test after treatment. As the physical arrangement of print and electronic information resources is unique to each academic institution, no standardized assessment

12. L. G. Ackerson, J. G. Howard, & V. E. Young, "Assessing the Relationship between Library Instruction Methods and the Quality of Undergraduate Research," *Research Strategies*, 9(1991):139-141.
13. *Op. Cit*., Bober, Poulin, & Vileno; Edwards; and Rader.
14. D. Barclay, "Evaluating Library Instruction: Doing the best you can with what you have," *RQ*, 33(1993):195-202; and O. Chadley & J. Gavryck, "Bibliographic Research Trends in Research Libraries," *Research Strategies*, 7(1989):106-113.

measure exists for gauging library skills at the college level. Therefore, a ten-item test was developed by a team of instruction librarians to assess participants' library skills levels. Test items covered such topics as how print and electronic sources are structured, the process of constructing a search query, transferability of search concepts between databases, and critical evaluation of information. Tests were scored on a 100-point scale.

Assignment to group was based on the condition of prior exposure to library instruction and type of instruction received. Thirty-four students, in two of the eight classes, completed the walking tour and accompanying worksheet several days prior to the scheduled library instruction session. Remaining students indicated whether they had attended a course-integrated library instruction session with another class anytime during their academic careers. Participants were then assigned to one of three groups. Group membership consisted of: Group 1— students with no previous exposure to library instruction (n=45), Group 2— students who completed the library walking tour and worksheet for education resources (n=34), and Group 3 — students who had previously attended a course-integrated library instruction session (n=27).

Treatment consisted of one course-integrated library instruction session. Following Kohl and Wilson's earlier work,[15] instruction was developed as a conceptual strategy and consisted of 65 to 70 minutes of librarian-led lecture and demonstration of relevant library databases supplemented with group exercises. After demonstration, students were placed into groups of three to five and assigned different projects (e.g., identify a database with full-text, find primary research articles on a given topic, email an article to one of the participants, access the email account, and print out the first page of the article). As a group, students were expected to formulate a search strategy, search a database, and locate and retrieve information available in print in the library or electronically. Students spent the last part of class time deconstructing their performance by critically evaluating the search, the database, the quality of results, and their searching experience.

## Results

No statistically significant effects were found when data were analyzed by gender or frequency of library use. A dependent t-test was calculated to compare the mean pretest score to the mean post-test score for 106 graduate students in Education. As predicted by the first hypothesis, the skill level of students significantly increased after attending a course-integrated library instruction session (dependent $t(105) = 2.18$, $p<.05$). The mean pre-test

15.*Op. Cit*., Kohl, & Wilson.

score was 49.43 (SD = 19.24) and the mean post-test score was 77.69 (SD = 14.64)

The second hypothesis proposed that students with repeated exposure to library instruction would perform significantly better on a library skills test than students with no prior library instruction experience. Surprisingly, an analysis of variance (ANOVA) revealed no statistically significant difference in post-test scores when analyzed by prior library instruction ($F(2,103) = 1.63$, $p = .20$). Students with no prior library instruction experience ($M = 76.67$, $SD = 13.98$) did not significantly differ from students who completed the walking tour and worksheet ($M = 77.06$, $SD = 16.97$) or students who previously attended a course-integrated library instruction session ($M = 80.19$, $SD = 12.67$). Total variance accounted for by this model was 3%. The mean of post-test scores by group and overall are indicated in Table 1.

**Table 1 Post-instruction test scores, by group**

| Group | N | M | St Dev |
|---|---|---|---|
| 1—No previous library instruction | 45 | 76.67 | 13.98 |
| 2—Assigned walking tour/worksheet | 34 | 77.06 | 16.97 |
| 3—Prior course-integrated instruction | 27 | 80.19 | 12.67 |
| Total | 106 | 77.69 | 14.64 |

## Discussion

The purpose of the current study was two-fold; to assess the effectiveness of a single, course-integrated library instruction session, and to investigate the cumulative effect of repeated library instruction on student learning outcomes. Through quasi-experimental design, this paper demonstrated that, regardless of the condition of multiple library instruction applications, all groups significantly improved their library skills knowledge after attending a course-integrated library instruction session.

Student scores on a library skills test increased on average over 25 points after instruction. These results are consistent with earlier findings, and contribute to the consensus as reported in the literature that course-integrated library instruction does have a significant impact on library skills learning outcomes. If course-integrated library instruction is responsible for the changes observed here, then its importance is clear. The benefit of student library skills development provides overwhelming support that the cost of professional time in developing and delivering course-integrated library skills is well invested.

The association between repeated library instruction as it relates to increased student learning outcomes is not so clear. Analysis indicates prior

library instruction does not appear to produce a statistically significant effect on post-treatment library skills scores. Earlier research investigating the cumulative effect of repeated library instruction is inconclusive, and this analysis likewise fails to support that repeated library instruction produces a noticeable benefit to students.

Despite the non-significant result, one notable statistic is that students previously attending a course-integrated library instruction session scored over three points higher on average and demonstrated less variability in score than either students with no repeated library instruction experience or students who completed the walking tour. Students may have attended previous course-integrated library instruction sessions from one to several semesters earlier, thus possibly indicating some long-term retention of the instructional content.

Conversely, students who completed the assigned education tour and worksheet only a few days before the treatment of course-integrated library instruction demonstrated scores less than a half point higher than students with no prior library instruction experience. Results for these students may have been influenced by the attitude that they felt they already know the material, and so were less attentive.

Although this study suggests a critical examination of the education tour and worksheet as a precursor to course-integrated instruction is warranted, evidence is still not sufficient to conclude that repeated library instruction offers no additional scholarly benefit to students. Further, while this study has tended to corroborate earlier findings, it is difficult to generalize back to a larger population due to the use of convenience sampling. Timing of the administration of the post-test is also cause for concern. Although researchers disagree as to the appropriate time to administer a post-test, it is plausible that completing the post-test immediately after treatment may reflect experience with the test or measure short term recall rather than genuine changes in skills. Despite the limitations of the current study's design, the results suggest that continued research regarding the effect of repeated library instruction is warranted.