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Four Pedagogical Approaches in Helping Students Learn Information Literacy Skills

Ma Lei Hsieh ^{a,*}, Patricia H. Dawson ^{a,1}, Melissa A. Hofmann ^{a,2}, Megan L. Titus ^{b,3}, Michael T. Carlin ^{c,4}

^a Moore Library, Rider University, 2083 Lawrenceville Rd., Lawrenceville, NJ 08648, USA

^b English Department, Rider University, USA

^c Psychology Department, Rider University, USA

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ABSTRACT

In spring 2012, Rider University librarians heightened their collaboration with classroom faculty to teach students in core writing classes information literacy (IL) skills during IL instruction (ILI) sessions. This quasi-experimental study assessed four pedagogical approaches for single or multi-session ILI. The conventional approach, which involves lectures, demonstrations, and hands-on time, was used in both the control and the experimental groups. The three experimental groups involved: (a) assigning students to preview the class Research Guide and take a graded quiz (Preview group), (b) engaging interactively with students during the ILI session (Active Learning group), and (c) providing multiple instruction and follow-up sessions (Multi-session group). A different pretest and posttest based on the first two ACRL Information Competency Standards for Higher Education (2000) were developed for assessment. The results showed that student knowledge of concepts included in the training improved significantly in both the control and the experimental groups, but no differences were found among the teaching methods employed. The qualitative analysis revealed that the professor in the Preview group who integrated IL cohesively in her assignments experienced more satisfactory learning outcomes. The overall low scores suggest that more powerful instruction strategies besides diversified pedagogies are needed to significantly enhance long-term retention.

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INTRODUCTION

The Franklin F. Moore Library (Moore Library) at the Lawrenceville campus of Rider University in New Jersey provides an active information literacy instruction (ILI) program and offers course-integrated ILI to its 5500 undergraduate and graduate students at the request of faculty. The librarians at the Moore Library have been following the assessment movement in higher education in the U.S. for over a decade and have assessed student learning outcomes of information literacy (IL) since 2002. For the past few years, the Moore librarians used pre- and posttests to assess students' basic IL skills on the first two IL objectives of the ACRL [Information Literacy Competency Standards for Higher Education \(2000\)](#):

1. The information literate student determines the nature and extent of the information needed. Students will identify a variety of types and formats of potential sources of information.

2. The information literate student accesses needed information effectively and efficiently. Students will recognize controlled vocabularies; illustrate search statements that incorporate appropriate keywords and synonyms, Boolean operators, nesting of terms, and truncation, refining the search statement when necessary; and determine the most appropriate resources for accessing needed information.

In recent years, the Library's ILI program has targeted students in the required core Research Writing course and the Baccalaureate Honors Program's (BHP) writing course. These are courses that allow the Moore librarians to reach most freshmen and sophomores to teach them basic IL skills. In the spring of 2012, all sections of these courses had an ILI, and many faculty members requested a follow-up session a few weeks after the initial ILI to give students additional instruction and hands-on time. All classes took a pretest prior to receiving instruction in the ILI. Those with follow-up sessions allowed librarians to administer a different posttest, with questions parallel to or on similar concepts as questions in the pretest, to assess retention from the previous ILI session. The 2010–2011 assessment revealed that students' retention of basic IL skills and knowledge from the one-session ILI with the conventional instruction method was very limited ([Dawson, Hsieh, & Carlin, 2012](#); [Hsieh, Dawson, & Carlin, 2013](#)).

In order to help students improve their basic IL skills, several Moore Librarians and class faculty worked closely to integrate IL into their

* Corresponding author. Tel.: +1 609 896 5241.

E-mail addresses: mhsieh@rider.edu (M.L. Hsieh), pdawon@rider.edu (P.H. Dawson), mhofmann@rider.edu (M.A. Hofmann), metitus@rider.edu (M.L. Titus), mcarlin@rider.edu (M.T. Carlin).

¹ Tel.: +1 609 896 5114.

² Tel.: +1 609 895 5637.

³ Tel.: +1 609 896 5090.

⁴ Tel.: +1 609 895 5424.

courses in spring 2012. The present study assessed the effectiveness of four approaches to teaching IL skills. All approaches used the conventional methods of lecture, demonstration, and hands-on time. The three experimental approaches were designed collaboratively by the librarians and teaching faculty. The three methods were (a) assigning students to preview the IL content before the library session and giving a graded quiz for the preview before or right after the IL session; (b) engaging students interactively during the session; and (c) providing students with multiple IL and follow-up sessions.

The authors hypothesized that the students' posttest scores would be higher than their pretest scores for all groups; that the Preview group would perform better than the other groups; that the Active Learning group would perform better on searching with the Boolean connectors AND/OR and with truncation; and that the Multi-session group would outperform the control group that used only the conventional method with no extra reinforcement.

LITERATURE REVIEW

This review focuses on studies of pedagogies for IL training and examines the correlation between the instruction methods and student learning of IL in colleges. Many studies have reported on assessments of IL research instruction (RI) for general education courses or subject-specific courses. However, few studies provide evidence of student learning in relation to teaching methods (Mokhtar, Majid, & Foo, 2008). Hook (2012) reviewed the literature in *College & Research Libraries* from 2009 to 2011 and reported studies with a broadly defined positive impact of library instruction on student learning. Some studies in the review were examined for their pedagogical approaches, but most did not link learning to particular teaching methods. For example, Roselle (2009) reported interview results of 31 academic librarians regarding their teaching methods for under-prepared college students. These methods included simplicity, mini-sessions to break down IL elements, scaffolding instruction with one IL objective at a time, and using engaging activities. No evidence of enhanced student learning from use of these methods was presented. Johnson, Anelli, Galbraith, and Green (2011) reported that honors students gained IL skills from scaffolding instruction, including hands-on activities, feedback, and the multiple assessment instruments embedded throughout the course. These honors students in science had the same problems using the library as the other students. The authors found that one session is insufficient to teach IL skills thoroughly.

Burkhardt (2007) echoed the point that information literacy instruction must go beyond the one-session mode. Her three-credit IL course integrated lectures, active learning, hands-on exercises, a bibliography of a research project, and a journal discussing the process of collecting and evaluating each type of resource. Students improved significantly in the posttest, yet she was still disappointed at their improvement on Boolean connectors. Gross, Latham, and Armstrong (2012) developed a three-step process model (ASE—analysis, search, and evaluation) to improve information literacy skills for below-proficiency college freshmen. A variety of empirical methods, including tests, surveys, interviews, and focus groups were used to collect data. However, student learning outcomes were not discussed. Small, Zakaria, and El-Figuigui (2004) observed and interviewed librarians and students in seven community colleges on the motivational strategies used in IL and investigated students' on- and off-task behaviors during the classes. The ARCS (attention, relevancy, confidence, and satisfaction) Motivational Model was used for data analysis. Among the findings, attention strategies (e.g., questioning) were used the most and satisfaction strategies (expectancy/value of the research results or skills learned) the least. Because the focus of this study was solely motivational factors, nothing was said about student learning. Maitaouthong, Tuamsuk, and Techamanee (2010) developed an instructional model that integrates IL into a general education course at the college level. The teaching methods included lecture, demonstration, problem-based learning,

case studies, and students' assessment of their own learning. The posttest indicated that the experimental group demonstrated higher learning than the control group.

Walton and Hepworth (2011) tested three interventions designed to develop the IL skills of first-year undergraduates. In their study, pedagogy took a blended approach and combined face-to-face and online social network learning (OSNL). The group incorporating OSNL proved most successful. It seems that conversation and feedback with peers promoted high-level cognitive processes that resulted in deeper learning and higher confidence. Kraemer, Lombardo, and Lepkowski (2007) compared face-to-face, hybrid, and online instruction of IL and found that students improved the most through hybrid learning. This suggests that online instruction should be part of a comprehensive information literacy program but that it should not completely replace librarian-student interaction. Librarians at the University of Arizona offered a one-credit IL online course to the required English Composition course and assessed student learning from four groups (Mery, Newby, & Peng, 2012). The group taking the 10-week online course improved significantly in almost all ACRL IL categories. The group receiving one-shot IL from librarians improved significantly in some categories, but the gains were not consistent and not as great as those who took the online course. No differences were found between the pre- and posttests in the control group, which received no IL teaching, and in the group receiving IL from class instructors. The authors concluded that well-designed IL online courses could be effective. Because IL skills are complex and cognitively challenging, students learn them best from a formal course rather than one-shot instruction.

Cook (2008) offers a useful overview on the main educational theories for college teaching and provides two teaching models: direct instruction (Objectivism) and student-centered learning (Constructivism). The chapters in his co-edited book (Cook & Sittler, 2008) detail 17 instructional pedagogies that fit nicely into the framework of the teaching models and educational theories. The pedagogies (e.g. Cephalonia, games, clickers, metaphor, storytelling, problem-based learning, etc.) offer practical ideas on engaging students in the research process and likely add fun and relevancy for students in the sessions. Although the authors of the book reflect on lessons learned from their specific methods, little quantitative evidence is provided for student learning of IL skills from these methods. Unlike most studies that test IL methods in for-credit or semester-long courses, this book provides valuable pedagogies for one or multiple sessions of IL, which can be adopted by the majority of instructional librarians in higher education who teach the one-session format. Cook asserted that different pedagogies fit different needs and that no single pedagogy can claim to be the most effective. Grassian and Kaplowitz (2009) and Mokhtar and Majid (2006) also discussed the benefits of using multiple methods and matching them to different situations. In addition, Grassian and Kaplowitz (2009) presented learning theories from psychology and explained how the theories are applied in the research instruction models. This is a valuable source for librarians to acquire theory-based practice because few studies report evidence of student learning from such practice (Hook, 2012).

Only a few studies assess the effect of pedagogy on student learning outcomes for one-session IL. Kenney (2008) detailed an 80-minute IL session using problem-based teaching. However, no evidence for student learning outcomes was provided. Ilic, Tepper, and Misso (2012) used an answerable question as the method for delivering a single workshop to third-year medical undergraduate students. Those who took a workshop did not improve their medical literature searching skills but were more confident in constructing clinical questions and in identifying information gaps.

In sum, few single-session IL studies have investigated the connections between pedagogies and student learning outcomes. The current quasi-experimental study uses pre- and posttests to assess four non-random groups with different pedagogical approaches (conventional, preview, active learning, multi-session) for IL training. Despite the known limitations of quasi-experimental assessment, results still can

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