Active Learning in Information Literacy Instruction:

A Study-by-Study Review of the Literature

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Information literacy instruction (ILI) is typically provided by librarians to students in higher educational learning environments. According to the Association of College and Research Libraries (2000), information literacy (IL) is defined as "a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." Course instructors typically invite librarians to teach a single session to students on how to use specific online resources (Detlor, Booker, Serenko, & Julien, 2012). Less frequently, librarians co-teach discipline-based courses that include an IL component, with subject specialists (Detlor et al., 2012). In both scenarios, librarians may struggle to engage students in ILI. Librarians have found that active learning is an approach that can promote student engagement in the learning process. Active learning is "a process whereby students engage in activities, such as reading, writing, discussion, or problem solving that promote analysis, synthesis, and evaluation of class content" (University of Michigan Center for Research on Teaching and Learning, 2016). The purpose of this paper is to review the research that has evaluated the impact of active learning approaches in both single-session and course-integrated ILI.

**Single-session ILI**

Detlor et al. (2012) studied the perceptions of students who had received one or more ILI sessions throughout their academic career. They recognized that active learning had the potential to improve student engagement, but that it also cost extra staff time and resources to implement. They posed the following three research questions:

1. What are the student learning outcomes of active ILI and passive ILI?

2. Does active ILI result in more positive student learning outcomes than passive ILI?

3.  How does the amount of active ILI received influence student learning outcomes? (Detlor et al., 2012, p. 148)

The learning outcomes they were interested in measuring included psychological outcomes (i.e. changes in attitudes or values), behvioural outcomes (i.e. changes in action), and benefit outcomes (i.e. time savings, effort reduction).  They used a quantitative correlational research design.  To collect date, they emailed an online survey to all full-time undergraduate students enrolled in a Commerce program at a medium-sized Canadian University.  The survey contained questions designed to capture three groups of independent variables (demographics, amount of ILI received, and amount of active ILI received) and one group of dependent variables (learning outcomes).  They analyzed the data using Multivariate Analysis of Variance (MANOVA) techniques and "post-hoc tests" (Detlor et al., 2012, p. 153).  They found that active ILI directly correlated with positive student learning outcomes, whereas passive ILI did not.  They also found that people who received up to 30 minutes of active ILI had the same learning outcomes as those who received more than 30 minutes of active ILI.  This was good news for librarians with limited time and resources in which to implement active learning.

Whereas Detlor et al. (2012) examined student perceptions of learning outcomes, Hsieh, Dawson, Hofmann, Titus and Carlin (2014) examined the performance effects of active learning. Hsieh et al. (2014) had had been assessing students' IL learning outcomes for ten years at Rider University, and had found that student retention of IL skills and knowledge after single-session ILI using conventional teaching methods was very limited.  The purpose of their study was to assess the effects that four different pedagogical approaches (conventional, preview, active learning, and multi-session) would have on student performance.  They employed a quasi-experimental research design and made four separate hypotheses:

1. Students' posttest scores would be higher than their pretest scores for all groups

2. The Preview group would perform better than the other groups

3. The Active Learning group would perform better on searching with Boolean connectors AND/OR and with truncation

4. The Multi-session group would outperform the control group that used only the conventional method with no extra reinforcement (Hsieh et al., 2014, p. 235)

Participants were students in eight sections of two different required writing courses. All eight sections received conventional ILI, which included lecture, search demonstrations by the librarian, and hands-on time for practice searching. Additionally, three of the sections were required to review a Research Guide created by the librarian prior to the class (preview approach); two of the sections completed a worksheet during class to practice the search techniques (active learning approach); and, one of the sections attended an extra follow-up session (multi-session approach). A pretest comprised of ten multiple-choice questions was administered to the participants before the ILI session, and a posttest comprised of the same ten questions (worded differently to reduce effects of memory on performance) was administered at a follow-up session several weeks later. The data was analyzed using factorial and one-way analyses of variance (ANOVAs) to test for differences among the groups. The results indicated that although there were significant gains from pretest to posttest across all groups, there were no differences among the groups as hypothesized. Thus, there were no additional gains in learning outcomes for students in the Active Learning groups. A limitation of this study was that it contained many non-controlled variables that could have influenced the outcome.

Like Hsieh et al. (2014), Cohen, Poggiali, Lehner-Quam, Wright and West (2016) also examined the performance effects of active learning. Cohen et al. (2016) framed the research

problem in terms of the difficulty of teaching students what they need to know in the limited

amount of time that librarians are typically allowed in single-session ILI.  They hypothesized

that adopting the flipped classroom approach would maximize student learning and engagement

in a context where there is a limited amount of available time.  Flipped classes typically involve

homework activities assigned before class, and active learning exercises during class time.  The

research questions were as follows:

1.  Do students in a flipped session demonstrate greater knowledge before their session than

    the students in a control session?

2.  Do flipped and control students demonstrate significant, positive improvement in

    knowledge after their session? (Cohen et al., 2016, p. 41)

They employed a quasi-experimental study design to compare the performance effects on

students who were in the flipped sessions with students who were in the control sessions.  The

participants were undergraduate and graduate students in thirteen business classes and six

education classes.  At the beginning of each session, the instructors administered pre-tests that

measured students' IL skills and knowledge.  At the end of each session, the instructors

administered post-tests that measured students' IL skills and knowledge, as well as their

perceptions of the library sessions.  An independent sample t-test revealed that the groups in the

flipped sessions performed significantly better on the pre-test compared with the groups in the

control sessions.  This implied that the homework assignment in the flipped class had a positive

impact on student learning.  However, two paired sample t-tests revealed that the groups in the

control sessions demonstrated significant improvement from pre-test to post-test, while the

groups in the flipped sessions with the active learning did not reveal significant improvement.

In terms of student perceptions of their learning experiences, more students in the flipped

sessions reported "liking the class a lot" (Cohen et al., 2016, p. 47), although students in both

groups reported enjoying the sessions overall.   One important limitation of the study was that

the cohorts in both the flipped and control groups of the education classes were too small to yield

statistically significant results.  This weakens the strength of the claims coming out of this study.

## Course-integrated ILI

Bond (2016) is one of the few researchers who examined the use of active learning in the

context of course-integrated ILI.   He reported a case study in which active learning strategies

were employed to teach IL skills in three undergraduate courses at the University of Mary

Washington.  In describing the research problem, Bond asserted that the Internet had brought

about significant changes in higher education that allowed learners to interact in new ways with

instructors, information, and other learners.  Direct transmission approaches to teaching IL skills

were no longer appropriate in this environment and more active approaches were needed.  Bond

did not explicitly include a research question in the report, but he did state that his goal in

changing his instructional approach was to "get more student engagement, deeper and more

active learning, and to get students to develop a sense of independence by taking charge of their

own learning" (2016, p.8).   The collected data included anonymous student surveys, reflective

study blog posts, student projects, and the instructors' own personal reflections on the process of

employing progressively more active learning techniques into the conduct of a series of three

courses.  Unfortunately, Bond did not state whether or how he analyzed the collected data.  This

is a weakness of the report given that analyzing data for themes and descriptions is an important

element in a well-conducted case study (Clark & Creswell, 2015, p. 293).  In reflecting on the

outcomes, Bond noted that active learning techniques can be effective in developing students' IL

skills and awareness.   Although active learning techniques required more work from the

students and the instructors, the experience made the work more "meaningful than the typical disposable assignment" (Bond, 2016, p. 8).   Finally, when students had the ability to influence the course content in active learning, they responded with "effort, engagement, and creativity" (Bond, 2016, p. 9).

**Summary and Conclusion**

Based on this review of the research, active learning appears to be an effective and engaging approach to teaching IL skills to university students.   Detlor et al. (2012) found that active learning directly correlated with student reports of positive psychological, behavioural and benefit learning outcomes in single-session ILI.   Hsieh et al. (2014) found that students who received active learning instruction in single-session ILI achieved significant gains in IL skills and knowledge; however, the gains were the same for students who received other types of IL instruction.   Cohen et al. (2016) was the only single-session ILI study to find that active learning did not produce positive effects on student performance.   However, students who received active learning instruction reported higher levels of enjoyment than students in the control groups.   In the only study of course-integrated ILI that was reviewed, Bond (2016) found that active learning was effective in developing students' IL skills and awareness in courses that had an IL component.   He also found that active learning provided a meaningful and engaging learning experience, and fostered students' effort and creativity in his classes.   While the research to date indicates generally positive support for active learning in single-session and course-integrated ILI, there is still room for additional research as the number of studies to date is quite small. Furthermore, the use of active learning in dedicated IL courses at the university level has not yet been explored, and therefore, it would be a fruitful avenue for future research.

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**Literature Map**