Using the I-LEARN Model to Design Information Literacy Instruction

Stacey Greenwell

University of Kentucky Libraries,
500 S. Limestone Street, Lexington, KY 40506, USA
stacey@uky.edu

Abstract. An experimental study examined whether information literacy skills instruction designed using the I-LEARN model increased student (*N*=112) understanding and application of information literacy concepts. While the analysis of the results of pre- and post-test scores and scores on a citation analysis showed that there was no significant difference between the two groups, students in the experimental group used the I-LEARN-designed research guide more often that students in the control group. This warrants further study, and the author is currently working with others to use I-LEARN as a framework to design research guides.

Keywords: Instructional design, I-LEARN, instructional technology, course guides, LibGuides, instructional strategies.

1 Introduction

Given the proliferation of information and the lifelong importance of information literacy and critical thinking skills, instructional designers, school media specialists, and librarians need to determine how to best design information literacy instruction in order to help students locate, evaluate, and use information effectively. This paper describes the first experimental research study [1] conducted to determine how instruction designed using the I-LEARN model [2] could increase student understanding and application of information literacy concepts and offer recommendations for future implementations of the model.

2 I-LEARN: Background and Elements

I-LEARN is an instructional design model connecting information science and instructional design. Like others [3-4], Neuman argues that information literacy skills should be integrated into the curriculum. They are more than just library skills; they are essential skills for learning at all levels and cannot be taught in a vacuum. Neuman describes this in some detail in an article describing the history and value of the school media center [5].

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Library science and instructional design are complementary, and Neuman presents the I-LEARN model which is an instructional design model focused on information use. The model is not solely a library skills model; it is a learning model which could be applied in a variety of situations focused in nearly any subject. Grounded in instructional design research and theories of information science, the model's central premise is that information is the basic building block of all learning and that use of information is learning. Simply put, learning is the central reason for seeking information in the first place. Neuman describes the work of a number of prominent researchers in information science theory [6-7] and uses Anderson and Krathwohl's [8] revised Bloom's Taxonomy as the underlying framework. The model is recursive, flexible, and can be used in any information setting. The model maps to both the AASL standards [9] as well as the current ACRL standards [10]. The I-LEARN model includes six elements as described in Table 1.

Table 1. The I-LEARN model

Identify	an information problem by activating an interest, scanning the environment, and focusing on a question
Locate	the needed information through searching and extracting the relevant information
Evaluate	that information through questioning its authority, relevance, and timeliness
Apply	that information to the question thorough organizing and communicating
Reflect	on what is found and revising as needed
Know	through personalizing and internalizing the information

3 Overview of Experimental Study

The primary purpose of the experimental study was to determine if information literacy skills instruction designed using the I-LEARN model increases student understanding and application of information literacy concepts as compared to how librarians currently provide information literacy skills instruction. This experimental research involved two groups: the experimental group (I-LEARN Instruction) and the control group (Standard Instruction). The experimental group (I-LEARN Instruction) received information literacy skills instruction in a single class period and had access to a library research guide designed using the I-LEARN model. The control group (Standard Instruction) received information literacy skills instruction in a single class period and had access to a library research guide designed using a systems design model.

The experimental group (I-LEARN Instruction) and the control group (Standard Instruction) were tested with information literacy pre- and post-test instruments, and the information resources participants selected for their class assignments were evaluated using a citation analysis rubric. A participant survey was given to participants upon submission of their assignment and included items gauging use of the library research guide, participant attitudes, and perceived value of the in-person instruction and library research guide. The pre- and post-test instruments were designed by the researcher and reviewed by two librarians and three instructional design faculty.

The study included 134 first-year undergraduate students enrolled in seven sections of the same required composition and communications course. Of the 134 students enrolled, 112 attended the information literacy skills class session and completed the information literacy skills pre-test, information literacy skills post-test, and participant survey.

3.1 Treatments

As is typical for much of information literacy instruction, both treatments included a one-shot, 50 minute class period of instruction. For both groups, the first 20 minutes included the same content:

0-5 min: Objectives; class needs/topics; introduction to library research guide which includes research process steps, links to relevant databases, checklists for evaluating information resources, where to get help, etc.

5-10 min: Importance of evaluation, steps for evaluating an information resource, evaluation practice.

10-20 min: Background research and pre-search strategies, keywords versus subjects, developing basic search strategy with practice searching, places to find sources for class needs/topics.

For the remaining 30 minutes, the control group had an opportunity for hands-on practice with assistance from the course instructor and the author. The control group used a standard online library research guide designed with a systems approach as their primary tool for this activity.

For the experimental group, the remaining 30 minutes included an introduction to the steps of the I-LEARN process through an online library research guide designed using I-LEARN as the framework (see http://libguides.uky.edu/ilearn for examples). The experimental group had a class discussion about various types of information and their uses, focusing on how those could be used for class topics. The experimental group discussed how they would find, evaluate, and integrate information resources for their assignment. Participants had time to practice finding information in groups, and the session concluded with a review of the model via the guide.

3.2 Results of Experimental Study

I-LEARN Instruction. This group had 70 participants. On the information literacy skills test, the group had a pre-test score of M=70.79, SD=12.15 and a post-test score of M=74.86, SD=13.78. The difference score for this group was M=4.07, SD=11.37. The citation analysis score for those who submitted their assignment online to the author (N=38) was M=2.89, SD=0.96 on a four point scale.

Standard Instruction. This group had 42 participants. On the information literacy skills test, the group had a pre-test score of M=62.62, SD=15.51 and a post-test score

of *M*=66.07, *SD*=18.63. The difference score for this group was *M*=3.45, *SD*=17.62. The citation analysis score for those who submitted their assignment online to the author (*N*=25) was *M*=2.92, *SD*=0.72 on a four point scale.

Participant Survey. Participants were given a ten item scaled survey rating their experience with the instruction and the library research guide as well items gauging use of the library research guide, participant attitudes, and perceived value of the in-person instruction. The participant survey included two open-ended questions to provide participants with the opportunity to elaborate on their responses. Most participants agreed with all of the statements in the participant survey.

Looking across both groups, there were no striking differences in responses. Of the participants (*N*=112), 94 agreed or strongly agreed that using the library research guide made it easier to find information resources for their assignment, 90 agreed or strongly agreed that they developed a better understanding of the research process after participating in the information literacy instruction session, 90 agreed or strongly agreed that information from the information literacy instruction session and library research guide will help them academically in the future, 88 indicated that they will use the library research guide for assignments in other classes, and 84 indicated that they will use what they learned from the information literacy instruction session for assignments in other classes. Only three participants felt that the information literacy instruction session was not a good use of class time.

Additionally, the participant survey included two open-ended items. Of the 57 participants who completed the open-ended items, 39 described the information literacy instruction session as helpful, and 26 participants offered a specific suggestion to improve the session or the library research guide for the future, with nine stating that the amount of time spent on information literacy instruction during the semester needed to be increased. Most of those respondents suggested that at least two class periods be devoted to library research. Five participants specifically described using the library research guide for an assignment in another course. Only three participants commented negatively on the information literacy instruction session.

3.3 Hypothesis Testing

Test of Hypothesis 1. The first hypothesis tested was as follows: "Students who receive information literacy skills instruction designed with the I-LEARN model will perform significantly higher on the information literacy skills test that covers the steps and procedure necessary to locate and evaluate information compared to students who do not receive the instruction."

In order to test the hypothesis, a *t*-test was performed. Prior to conducting the t-test, Levene's Test for Equality of Variances was conducted. Based on the result ($F(1,110) = 2.08$, $p = 0.15$), equal variances were assumed. The test of the primary hypothesis that students who receive information literacy instruction designed with the I-LEARN model (*M*=4.07, *SD*=11.37) will perform significantly higher on the information literacy skills test compared to students who received the standard

instruction (M=3.45, SD=17.62) did not yield a significant difference ($t(110) = 0.23$, p =0.82). Thus the hypothesis is not supported.

Test of Hypothesis 2. The second hypothesis tested was as follows: "Students who receive information literacy skills instruction designed with the I-LEARN model will perform significantly higher on the citation analysis rubric than students who do not receive the instruction."

In order to test the hypothesis, a t-test was performed. Prior to conducting the t-test, Levene's Test for Equality of Variances was conducted. Based on the result ($F(1,61) = 2.41$, $p = 0.13$), equal variances were assumed. The test of the primary hypothesis that students who receive information literacy instruction designed with the I-LEARN model (M=2.89, SD=0.96) will perform significantly higher on the citation analysis rubric compared to students who received the standard instruction (M=2.92, SD=0.72) did not yield a significant difference ($t(61) = 0.13$, p = 0.89). Thus the hypothesis is not supported.

3.4 Use of Library Research Guides

Usage of the library research guides for each group of participants was tracked using the library research guide software. Tracking was not available for individual participants, but total hits per guide were available as shown in Table 2.

Table 2. Number of Library Research Guide views, January – March 2013

	Number of Guide Views
I-LEARN Instruction (N=70)	678
Standard Instruction (N=42)	282

These usage figures show that the guide for the experimental group, I-LEARN Instruction (N=70), was viewed 678 times. The guide was viewed approximately 16 times per day during the period that participants were completing their assignments. Standard Instruction group participants (N=42) viewed their library research guide 282 times. The guide was viewed approximately 8 times per day during the period that participants were completing their assignments. Participants in the I-LEARN group viewed their guide twice as often as those in the standard instruction group. Despite examination of all data collected in the study, it is unclear why this is so and warrants future study.

4 Future Implementation and Study of I-LEARN

While no statistically significant difference was found in the experimental study, participants who received the standard instruction did not perform as well on the information literacy skills test as participants who received the I-LEARN instruction. The information literacy test difference score of those in the I-LEARN group (N=70)

was M=4.07, SD=11.37, and the difference score for those in the standard instruction group (N=42) was M=3.45, SD=17.62. The I-LEARN model is new, and at the time of this experiment, no examples of its use were available in the literature. This was one of the first times the model had been used in a real world setting, particularly in an academic library environment. As the I-LEARN instruction was the same as or slightly better than the standard instruction, this suggests that future study of the use of the I-LEARN model is needed.

Based upon this study, the author has several suggestions for future implementation and study of I-LEARN. First, it would be helpful for the librarian to work more closely with the faculty member on the class assignment. This would allow the instruction to be integrated more closely with the assignment and might provide opportunities for the librarian to participate in the class throughout the semester. Instruction designed with the I-LEARN model does lend itself to needing more time than a single class period information literacy instruction session; however, continuing to explore ways to improve the single class period information literacy instruction session is important as it is often the only time allotted for this instruction.

Future use and study should consider other options for delivery. In particular, the use of I-LEARN as a framework for an online library research guide should be examined more closely. Given the positive reaction from students in using the I-LEARN-designed research guide, the author has continued to explore using I-LEARN as a template for developing online library research guides. Librarians at another university have used I-LEARN as a template for course guides in chemistry, psychology, earth science, and writing to date. Currently two librarians there are conducting a study related to the effectiveness of I-LEARN as an online research library guide framework.

A future study might include more qualitative components in the research. Some questions arose as a result of this study. For students, what specifically did they find valuable about the in-person instruction and the library research guide designed using the I-LEARN model? The student insights in the participant survey were invaluable, and perhaps focus groups could be conducted in a future study to better understand student preferences between use of one design model versus another.

For faculty, how might they consider integrating concepts from the I-LEARN model into their course? Currently the author and the model's author are working with a small group of faculty to determine how faculty might do that. These teaching faculty are working to develop instruction and instructional materials designed using the I-LEARN model. The rationale for having faculty create materials is that they will be able to work with students throughout the entire research process. Librarians typically help with identifying a research question and locating and evaluating information. The faculty will work with students throughout the process and can be of particular assistance in helping students apply the information, reflect on/revise their work, and ultimately incorporate the information into their knowledge base and develop new questions with this new knowledge.

The model is promising in developing other types of instructional materials. The author is planning to develop an I-LEARN-designed Blackboard module to scaffold an assignment for a course she is teaching this fall. I-LEARN would serve as a strong

framework for video tutorials as well. Current information on additional research projects and examples of I-LEARN in practice can be found on the author's I-LEARN website: http://libguides.uky.edu/ilearn

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