Online and Face-to-Face Library Instruction: Assessing the impact on upper-level sociology undergraduates

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Abstract

Online information literacy instruction: can it impact learning as effectively as face-to-face instruction? Using a quasi-experimental design, this study examined that in relation to upper-level sociology students; it also considered whether library instruction affected participants' perceptions of learning formats' (i.e., online or face-to-face) effectiveness and the academic library's place in their research. Using a pretest/posttest design, no significant learning difference was found between the two instructional delivery formats. However, data suggested that instruction did impact online participants' perceptions of the academic library as a place for research. Implications of this research and future directions for inquiry are discussed.

Keywords: online learning, e-learning, information literacy, sociology, undergraduate students

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Introduction

The aim of library instruction is to provide meaningful, useful, and applicable information literacy learning opportunities for students. Of course, there are many ways to do this, and some instructional means result in better learning outcomes. Interest has burgeoned in the delivery of online and virtual instruction; undergraduate instruction has moved increasingly online, and as early adopters of online learning and outreach tools, libraries and librarians have worked to translate these instructional opportunities online. Part of this process involves considering the impact of the medium on student learning.

This study examines this issue through the lens of upper-level undergraduate sociology students. Seeking clarification to these points of inquiry is valuable for libraries and librarians attempting to determine whether to move instruction online and, if so, how to do so effectively. If librarians can build online learning interactions that are as meaningful and effective as face-to-face interactions, this can have far-reaching implications for libraries' instructional practices.

The Literature

Considering learners and their preferences is an important first step in offering library instruction online. Upper-level students are likely to depend on electronic resources independent of a subject librarian and, more broadly, feel they do not need formal instruction in information literacy; they believe they can identify their own information-seeking needs and find scholarly information independently (Earp 2008, Harrington 2009, Kumar, Ochoa and Edwards 2012, Monroe-Gulick and Petr 2012). To respond to these perceptions, librarians can work to offer information literacy instruction within the context of a specific scholarly need *rather* than in the silo of the library. This re-positioning can make learning more authentic and meaningful by demonstrating its clear connection to their academic purpose (Leibiger 2011). A study of social

sciences graduate students' information literacy knowledge found that situating instructional content online, rather than in the traditional library or campus space, expanded the librarian's presence and impacted students' information literacy knowledge (Harrington 2009).

How online information literacy takes shape, though, can vary. For instance, social sciences librarians may need to adapt and teach information literacy competencies through the lens of discipline- or department-specific standards rather than the Association of College and Research Libraries' (ACRL) standards (Gordon and Bartoli 2012, Lampert 2005). Resituating instruction may also involve integrating the library into problem-based or project-oriented, social constructivist learning environments (Leibiger 2011). Regardless of the format, reaching students in these ways involves forming deeper, more meaningful academic partnerships between faculty members and librarians (Gordon and Bartoli 2012, Lampert 2005, Leibiger 2011). Such collaborations can help make students more critical researchers who are engaged in their learning through concrete, useful knowledge-building activities (Lee Roberts and Taormina 2013).

Embedded librarianship, where library services are brought to the user (rather than the user to library services) is a frequently-used pedagogical structure that integrates information literacy instruction and librarian presence into subject-specific courses (Becker 2010, Carlson and Kneale 2011, Kesselman & Watstein 2009). These practices are not new and first took shape as branch libraries and liaison librarians were established (Hines 2013). Embedded librarianship and embedded library services have been shown to effectively reach learners, online and in-person (Costello, Lenholt and Stryker 2004, Daly 2011, Davis and Weber 2002, Herring, Burkhardt and Wolfe 2009, York and Vance 2009), and they shift the view from "library as space" to "library as a service" (Riccio 2012).

In fully online, face-to-face, or blended courses, embedded librarianship commonly includes posting information literacy information (handouts, instructions, videos, and tutorials), or establishing and monitoring discussion boards online (Herring, Burkhardt and Wolfe 2009, Jackson 2007, Markgraf 2008, Mestre et al. 2011). Librarians embedded online may also take on more instruction-focused work, such as assessing student performance (Hearn 2005). In instances where distance or fully-online students need to be reached, embedded librarianship helps to provide equitable experiences and to address the differences in knowledge, understanding, and experience these students face (Kumar, Ochoa and Edwards 2012, Matthew and Schroeder 2004).

Using technology tools to teach information literacy concepts is a well-accepted practice. Student learning can, and does, occur from online library instruction through online tutorials, synchronous sessions, supplementary materials, or other help resources (Bracke and Dickstein 2002, Buchanan, Luck & Jones 2002, Dewald 1999, Donaldson 2000, Ganster and Walsh 2008, Grant and Brettle 2006, Johnston 2010, Lo and McCraw Dale 2009, Sult et al. 2013). Embedding information literacy modules within academic courses can promote the growth of students' skills and confidence in using library resources, encourage students to seek assistance from the library staff, improve students' research-conducting abilities, and increase students' satisfaction with library services and resources (Hsieh and Holden 2010, Zoellner, Sampson and Hines 2008, Silver and Nickel 2005).

Teaching information literacy skills to social sciences students using technology tools provides a critical point of outreach, particularly since most students first use online resources to execute information-seeking processes (Earp 2008, Leibiger 2011). Screenshots, video demonstrations, and online instructions revise the traditional one-shot library instruction session

and extend the instructional interaction into the course management system (Becker 2012); this can shift the focus from the library to a specific assignment or need. And, for discipline faculty, embedding library content represents an option for increasing the technology use in their classrooms (Gordon and Bartoli 2012, Caravello et al. 2008; Lampert 2005; Louw et al. 2009). Social sciences students respond positively to faculty-librarian collaborations and view library content presented online as relevant and convenient to their learning; more importantly, social sciences students learn discipline-relevant library knowledge through such collaborations (Bracke and Dickstein 2002, Silver and Nickel 2005).

Methodology

Design

To consider the effectiveness of online learning modules in teaching upper-division sociology students, this study used a quasi-experimental design with a pretest-posttest that measured respondents' knowledge of information literacy concepts, perceptions of library resources and services, and attitudes about online learning. Participants were solicited from three upper-level sociology courses at Oakland University, a Midwest Carnegie-class doctoral institution. The pretest and posttest mirrored each other closely, and the same pretest and posttest were administered to face-to-face and online participants before and after the library workshops.

Materials

Two face-to-face workshops were offered for the three courses, and an online instructional module was embedded in each course's Moodle page. All students in these courses could participate in the workshops regardless of their participation in the study. The online and face-to-face learning workshops addressed the same content and differed only in delivery medium. In the face-to-face workshops, the librarian delivered lecture-style instruction in a

computer lab; using a presenter computer and screen broadcast software (i.e., Vision), she demonstrated processes and illustrated concepts on participants' computers.

For the online workshops, the librarian created several series of online instructional videos to replicate the instruction delivered in the face-to-face workshop. These videos were created using Camtasia, a screen capture tool that allowed for narration, annotations (i.e., highlighting relevant content), zooming in/out, and other features to prominently display important information. Five short video series were created: Getting Started - Using Library OneSearch (the library's discovery tool); Keyword and Subject Searching Strategies; Searching Subject-Specific Library Databases for Peer Reviewed Articles and Scholarly Journals; Expanding the Process: Tips and Tricks; and Other Helpful Tools (i.e., using RefWorks, the university's citation management tool). Videos ran between 1:04 minutes and 3:12 minutes in length, each video series contained between two and four videos, and videos were organized as playlists on the library's YouTube channel and in Moodle, the university's course management system (CMS).

Procedure

Students were contacted via email one week before the first face-to-face workshop was held; the email described the study and included a copy of the consent form. Each course's online module then opened in Moodle. Prior to engaging in either form of instruction, students completed a consent form; those who elected to participate in the study completed the pre-test and then moved onto the course content. Per Dewald's (1999) recommendations, online content was designed with a clear link to courses, illustrated objectives, followed a consistent structure, and offered information for those seeking additional help. Each video was also brief enough to hold students' attention and situated within each course's page in Moodle so as to be easily

findable (Bowles-Terry, Hensley and Hinchliffe 2010, Nichols Hess 2013, Oud 2009). Both instructional modes gave participants time to work through the skills and processes presented. At the conclusion of the workshops, study participants were then asked to complete the post-test.

Two face-to-face workshops were offered in March 2013; the online instructional content remained available for students to work through until the end of April 2013. At the end of the Winter 2013 semester, pretest and posttest data were downloaded, anonymized, and analyzed.

Data

Demographics

In total, 36 students (n=36) participated in the study; 31 students (n=31) completed both the pretest and posttest surveys and indicated a learning format (face-to-face, online, or both). These respondents' data are reflected in the results. Nineteen participants (n=19) attended the face-to-face workshops, eight (n=8) participants used the online course module, and four (n=4) participants used both resources.

Learning Outcomes

The study's pre- and post-tests assessed participants' knowledge of library concepts through questions that corresponded to skills or concepts articulated in the ACRL (2000) *Information Literacy Competency Standards for Higher Education* and to the workshops' learning outcomes. First, it was important that participants be able to articulate their information-seeking need, generate ideas for their research, and identify potential keywords (ACRL performance indicators 1.1.c, 1.1.e, 1.1.f, 2.1.d, 2.2.b); these first research steps were demonstrated using the Libraries' discovery tool, Library OneSearch. Participants also needed to be able to generate keyword and subject searching strategies for their research (ACRL performance indicators 2.2.b, 2.2.d, 2.2.e, 2.3.a, 2.4.a, 2.4.b). As a subsequent event in their research processes, participants also needed to

learn to identify quality peer-reviewed and scholarly content, which included evaluating information's sources (ACRL performance indicators 3.2.a, 3.2.d). And finally, participants needed to be able to revise and continue their research using information-seeking strategies, including mining information (i.e., citations) from gathered research (ACRL performance indicators 3.2.d, 3.5.a, 3.7.b).

These responses were coded as correct, incorrect, or that the respondent had indicated they did not know the answer. Each correct score was given a point value of 0.2; all other answers were given a point value of 0.0. The scores of these five questions were summed and noted as the pretest and posttest scores (see Table 1).

An independent-samples t-test was conducted to compare scores for face-to-face instruction and online instruction. There was not a significant difference in the scores for face-to-face instruction and online instruction (see Table 1). An independent-samples t-test was then conducted to compare scores for face-to-face instruction and online instruction at the posttest question level. At this level, there was not a significant difference in the scores for face-to-face and online instruction (see Table 2). Because students could engage in one or both of the instructional activities, a one-way between subjects ANOVA was conducted to compare the effect of instruction method on learning in participants electing face-to-face instruction, online instruction, and both instruction methods (see Table 3). There was not a significant effect of instruction method on learning at the $p<.05$ level for the three conditions of face-to-face instruction, online instruction, or both instruction methods. These results suggest that the method of instruction does not have a significant difference on student learning. Furthermore, it suggests that engaging in multiple learning formats (i.e., face-to-face *and* online) does not lead to significant learning gains.

Learning Formats: Preferences and Expectations

Participants were also asked to consider their learning format preferences for, and perceptions of learning effectiveness with, different instructional media. Using a Likert-type scale (1=Strongly Disagree, 5=Strongly Agree), they rated their opinions on five statements on both the pretest and posttest. A paired-samples t-test was conducted to compare perceptions of learning formats before and after library instruction. There was not a significant difference in perceptions of learning formats before and after library instruction (see Table 4).

Library Perceptions

Finally, participants' perceptions of the library and its role in their research were assessed through five statements on the pretest/posttest. Participants were asked to rate these statements using a Likert-type scale (1=Strongly Disagree, 5=Strongly Agree). A paired-samples t-test was conducted to compare perceptions of the library before and after library instruction. There was a significant difference in perceptions of the library before and after library instruction for four of five statements (see Table 5).

To consider how this manifested across specific instructional groups, a one-way between subjects ANOVA was conducted to compare the effect of instruction methods on library perceptions in participants electing face-to-face instruction, online instruction, and both instruction methods. There was a significant effect of instruction method on library perception at the $p<.05$ level for the three conditions of face-to-face instruction, online instruction, or both instruction methods for one pretest statement: *The library is the first place I go when starting my research*. Post-hoc tests using Bonferroni indicated there was a significant effect of instruction method on pretest library perceptions in participants who selected the online instruction method as compared to the face-to-face instruction method and both instruction methods. The post-hoc

test of the posttest using Bonferroni showed no significant effect of instruction method on library

perceptions in participants selecting online instruction, face-to-face instruction, or both

instruction methods. (see Table 8). This suggests that, following library instruction, participants

who selected the online learning method were more likely to use the library as a starting point for

future research.

Discussion

Face-to-Face and Online Learning: Equally Effective

In examining these findings, it is important that no significant difference in performance was

observed on the pretest and posttest between instructional groups. This suggests that online

instruction can be as effective as traditional face-to-face instruction in teaching upper-level

sociology students research skills. Moreover, this suggests that continued development of online

learning objects and online learning environments related to library and information literacy

knowledge is useful. Since this may be an effective option, libraries and librarians should

consider building these environments in scalable and meaningful ways.

Even though there was no significant difference in student pretest/posttest performance,

scores on posttest assessment were not as high as hoped (see Table 1). This suggests that,

regardless of format, librarians and instructors need to consider how to best deliver relevant,

high-quality instruction. An analysis of the question-by-question breakdown illustrates that on

only one question – identifying the meaning of *peer-reviewed* – did all participant groups

achieve at least a 50% correct response rate (see Table 2). The two most challenging questions

for all participants were the identification of scholarly journals and searching an article's

references or citations. While this study focused on the delivery of introductory research skills

(e.g. keyword versus subject searching, tips for mining a record), perhaps more basic instruction

was necessary to better scaffold this learning and improve assessment scores. Considering learners' preexisting understanding and gauging this knowledge in meaningful ways to shape instructional practices, then, is an ongoing consideration *regardless* of instructional format.

Participants who used both face-to-face and online learning interactions had highest pretest and posttest assessment scores (see Table 1). Using both optional learning opportunities implies that these participants were perhaps more motivated or engaged in their learning. It also illustrates a potential question for future inquiry: is online instruction best when *coupled* with face-to-face learning? This could be constructed in a number of ways. For example, the flipped classroom model delivers introductory information via video or other e-learning tools prior to face-to-face instruction. Alternately, face-to-face instruction can be delivered *first* and targeted online learning objects or environments can be designed to respond to the questions and issues identified therein. Continued research on whether online learning is most effective when paired with face-to-face interactions, and in what format this online learning has the greatest effect, would be valuable to libraries and department faculty as they consider e-learning options.

Face-to-Face Instruction Perceived as More Effective

While the data indicated there was not a significant difference in perceptions on learning formats following face-to-face instruction, online instruction, or both instruction methods, examining participants' qualitative feedback on the value of instructional formats is instructive as librarians consider where to build instructional connections. Participants consistently preferred face-to-face learning interactions for several reasons. First, the personal connection received through face-to-face sessions was considered valuable and not replicated online. One participant noted that face-to-face instruction was more effective because "there is not something between you and the instructor," while another perceived a "[loss of] a lot of things that are

picked up from non verbal [sic] communication" when working with online instructional tools. Several participants indicated that they are easily distracted or do not devote as much attention to online learning objects. One participant wrote, "I get bored easily when learning online, so I prefer face-to-face instruction," while another said that face-to-face instruction "is less boring and more interactive." Finally, participants appreciated the immediacy of instructor response in face-to-face instruction. Many of the respondents noted that they could ask specific and targeted questions that are "answered on the spot or even by step by step instruction with comments."

Those respondents who preferred online instruction cited convenience as a factor. One participant noted that, "Online instruction can be handled during the MOST convenient time" (emphasis theirs) for their needs. Another participant cited the convenience of being able to review information as needed. They stated that online learning modules provide "a useful teaching tool [that]… allows me to rewind and re-listen [to] concepts I may not have heard clearly or that I need repeated. I love this option with online instructions/videos." Maximizing online learning's convenience while incorporating the positive interpersonal components of face-to-face instruction, then, is an area for additional research.

Using Instruction to Improve Online Users' Perception of the Library and its Resources

Finally, respondents' pretest and posttest data indicated that library instruction – whether online, in-person, or in both formats – improved the library's relevance in their research. Online learners showed a greater perception increase, specifically in the perception of the library as a starting point in the research process. This may be for a variety of reasons. First, those who attended the face-to-face workshop may have had positive opinions of the library and had those opinions confirmed, rather than changed, through instruction. Conversely, those participants who self-selected the online learning option may have been less aware of the library's online services

and access to scholarly material; modules demonstrating the library's online presence made it more relevant to their research. Perhaps the most salient point is that librarians can positively affect users' perceptions of the library's purpose in their research process and can even reach those students who do not come to the physical space. Continued development of online learning objects and online course presence is necessary, then, since intentional design of these resources can affect library perception.

Interestingly, those who saw a significant perception shift were of junior or senior standing. This suggests that users' opinions of the library may not be locked throughout their academic experience. This is relevant as librarians consider preparing students for professional work and post-graduate education; illuminating the important role the library can play in lifelong learning has meaning. Library instruction may have impacted these users because it was timely, targeted, or relevant to their needs as upper-level students While online learning objects *have* been shown more effective when embedded in authentic contexts (Dewald 1999), further investigation on the most effective timing and environments can guide the development of online learning interactions.

Future Directions

While this study provides insight into the effectiveness of online and face-to-face instruction for upper-level sociology students, continued examination with a larger sample size needs to be conducted to make findings more generalizable. This may help to confirm if online instruction can be as effective as face-to-face instruction. From there, studying how to deliver library learning online in scalable, strategic, and coordinated ways for the social sciences is critical (Bracke and Dickstein 2002, Bridgland and Whitehead, 2005).

As academic librarianship as a profession changes, understanding these core instructional and perceptional issues can ensure that learning interactions are designed to foster more meaningful knowledge-building. If librarians know what students think about the library's resources and purpose in their learning experience, they can more adequately address misconceptions and target instruction and outreach efforts to specific points-of-need. This, in turn, can help inform and shape how faculty-librarian partnerships are created and how the academic library as a place and a service is presented at different points in an undergraduate's research life (e.g. the introductory undergraduate research course and advanced discipline-specific undergraduate scholarship). And, pushing back against these issues through the use of online tools and resources may help in providing highly-used, discipline-focused library instruction that is both convenient and personalized.

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