Butler University
Digital Commons @ Butler University

Scholarship and Professional Work | University Libraries

2011

Course-Integrated information literacy instruction in introduction to accounting

Anne Kelly
Butler University, akelly@butler.edu

Teresa Williams
Butler University, twilliam@butler.edu

Brad Matthies
Butler University, bmatthie@gmail.com

J. B. Orris
Butler University, orris@butler.edu

Follow this and additional works at: http://digitalcommons.butler.edu/librarian_papers

Part of the Accounting Commons, and the Library and Information Science Commons

Recommended Citation
Anne Kelly, Teresa Williams, Brad Matthies, and Deane Orris. "Course-Integrated information literacy instruction in introduction to accounting" Journal of Business & Finance Librarianship 16.4 (2011): 326-347.

This Article is brought to you for free and open access by the University Libraries at Digital Commons @ Butler University. It has been accepted for inclusion in Scholarship and Professional Work by an authorized administrator of Digital Commons @ Butler University. For more information, please contact fgaede@butler.edu.

Course-Integrated Information Literacy Instruction in Introduction to Accounting

ANNE S. KELLY
TERESA D. WILLIAMS
BRAD MATTHIES
J. BURDEANE ORRIS
Butler University, Indianapolis, Indiana, USA

Shortened version of the title suitable for the running head: Course-Integrated Information Literacy Instruction

Course-Integrated Information Literacy Instruction in Introduction to Accounting

ABSTRACT

Two groups of students enrolled in Introduction to Accounting volunteered to participate in a pedagogical study to assess course-integrated information literacy instruction. Only one group had received information literacy instruction in an earlier business course. Academic librarians provided three instruction sessions and students completed a semester-long case to evaluate a company as a potential investment. The results suggest that information literacy skills can be learned for application in subsequent coursework. This research also provides some evidence of significantly greater improvement in information literacy and significantly higher perceptions of course-integrated instruction benefits by students who had not received the previous instruction.

KEYWORDS information literacy, course-integrated instruction, librarian-faculty collaboration, student learning, retention, assessment

INTRODUCTION

Business research often overwhelms undergraduate students with its sequential steps and complex set of interrelated resources. Academic librarians and faculty are challenged to effectively teach the required skills, which can be simplified using a conceptual framework for research instruction. The Information Literacy Competency Standards for Higher Education of the Association of College and Research Libraries (ACRL), a division of the American Library Association (ALA), provide “a framework for assessing the information literate individual” and address five levels of proficiency

(ACRL, 2000, p. 4). As described by Reichel and Ramey (1987), this approach enhances learning, making it more likely that "students should be able to apply what they have learned, to transfer it to new situations, and to generalize from it" (p. xviii). Although it is difficult to determine how much knowledge students retain, a longitudinal study by MacMillan (2009) suggests that it is possible to "observe long-term changes in the information literacy skills of students and to draw conclusions about the nature and causes of those developments" (p. 140).

This paper discusses a pedagogical empirical study using student subjects in an introduction to financial accounting course to investigate whether information literacy (IL) knowledge and skills taught within a conceptual framework are retained. One important aspect of this study is to ascertain whether students who received IL instruction in an introductory business course would show significantly higher performance than students who were not previously trained. The study uses a pre-test questionnaire administered at the beginning of the semester for the accounting course to gather data to test for this effect.

Common at many universities with professional schools of business, first-year students enroll in an introduction to business course followed by an introductory financial accounting class in their second year. In this study, the exploratory freshmen business class includes business IL training with additional instruction using financial applications embedded in the introductory accounting course. Students across this private midwestern university who have not taken the introductory business course also enroll in this same accounting class, permitting a comparison between these two groups.

Another facet of this research involves the investigation of significant differences between the two groups in IL knowledge and skills at the end of the accounting course. The IL standards and related performance indicators provide the framework necessary to develop the interrelated sequence of instruction activities and associated assignments so that students enrolled in the accounting course use these skills and apply their knowledge. A post-test questionnaire given at the end of the accounting course semester solicits information about students' knowledge of library resources useful in evaluating a potential investment in a company. It also asks students to share their perceptions of the benefits and helpfulness of course-integrated IL instruction in order to explore whether student perceptions are significantly different between the two groups.

BACKGROUND

A critical skill in the modern business environment is the ability to quickly find and ethically use relevant information necessary for decision-making. IL instruction aimed at preparing students to become "competent entry-level knowledge workers in the information society" (Hawes, 1994, p. 60) is important because business entities incur tangible costs associated with reduced operational efficiency and lost opportunities when their employees lack information literacy skills (Cooney, 2005, p. 4 referring to a study by Cheuk, 2002). Technological advancements and the evolution of global markets have particularly impacted the Accounting discipline so that graduates must possess the abilities to adapt to these changes, which are best taught using a "learn-by-doing approach" (Gabbin, 2002, p. 83). In addition, accountants rely on knowledge gathered from sources external to the organization and therefore, accounting educators

must find effective methods to teach the skills necessary for the ethical treatment of information (St. Pierre, Wilson, Ravenscroft, & Rebele, 2009). Specifically, Cunningham and Anderson (2005, p. 4) recognize the parallels between accounting education and information literacy instruction so that the "call for changes in accounting education to better teach these [critical thinking and continuous learning] skills is congruent with goals of business librarians to teach information literacy skills in disciplines such as accounting."

Conceptual Framework

A conceptual framework in many disciplines provides the necessary structure for a cohesive and comprehensive understanding of the related information. In the context of a student's search of bibliographic information, Kobelski and Reichel (1981) indicate that a conceptual framework may be used "to provide a meaningful sequence for the information covered" (p. 73) especially for course-integrated IL instruction. O'Keeffe (1998) suggests more strongly that the framework can actually function "as a tool in achieving information literacy" (p. 73).

Course-Integrated Instruction

Academic librarians stress the importance of a "course-specific collaborative approach to incorporating IL/BIL (Information Literacy/Business Information Literacy) into individual classroom settings" (Simon, 2009, p. 252). Additionally, Zabel (2004) emphasizes that IL instruction "must be integrated, relevant, ongoing, collaborative, and applied" to be successful (p. 20). Past studies have also shown the effectiveness of collaborative teaching efforts for IL training. Atwong and Heichman Taylor (2008) worked together to teach students how to use a new business database. They specify

that “faculty-librarian collaboration in the implementation process creates a meaningful learning experience while enhancing students’ information literacy” (p. 439). Another study concludes that librarian-faculty collaboration can result in a useful partnership that “is an effective means of improving students’ information literacy” (Bowers, Chew, Bowers, Ford, Smith, & Herrington, 2009, p. 124).

Several studies of faculty-librarian collaboration have focused on IL training in accounting courses. Murphy and Hoeppner (2002) found that the combined efforts of an accounting educator and librarian using a conceptual framework with structured guidelines helped students prepare for class projects in an intermediate financial accounting course. Jackson and Durkee (2008) also utilized a collaborative approach that had a positive impact on IL skills of students in an international accounting course. These authors found that “(c)ourse-integrated IL instruction sessions are an extremely effective method of introducing students to print and electronic resources in accounting as well as introducing and/or reinforcing information literacy concepts” (p. 88). In fact, Cooney (2005), in a survey on business IL instruction, found that most of these research efforts have been directed to graduate students or upper-level undergraduates. Cooney concludes that “(p)erhaps the greatest challenges to collaboration are engaging the interest of faculty who have not collaborated in the past, and enlarging upon the collaborative efforts already in place” (p. 18).

Retention of Information Literacy

A major thrust of the research described in this paper is the retention and learning of IL skills over time. Orme (2004) stresses the importance of this objective. “If information skills instruction is a component of information literacy, our efforts need to

have some lasting impact. Knowledge should be retained and, more important, transferable to other situations and contexts" (p. 213). In their study on "the enduring impact of library instruction" (p. 386), Wong, Chan, and Chu (2006) found that students demonstrated short-term retention at four to eight weeks after the training session. Likewise, Lieberthal (2009) found that most students applied library instruction which included business databases, from the time they received the IL instruction through the remainder of the semester.

The research discussed in this study is an extension of these earlier studies because it examines retention beyond the course in which the initial instruction is conducted. Orme (2004) summarizes this study's expectation well. IL instruction sessions provided early in a student's college career "are often intended to form the foundation for information literacy skills that students can build on as they proceed through their academic careers and beyond" (Orme, 2004, p. 206). This research study anticipates that students will learn and apply IL skills in subsequent coursework.

Student Perceptions of Information Literacy Instruction

Another objective of the research study described in this paper is to investigate students' perceptions of the benefits of IL instruction in a business accounting course. Rutledge and Maehler (2003) examined the views of students regarding the helpfulness of a special library instruction session intended to introduce students to print and electronic bibliographic resources in a Principles of Marketing course. These researchers conclude that students perceived a benefit related to this training.

Zoellner, Samson, and Hines (2008) explored student perceptions in an Introduction to Public Speaking course. Two aspects of their study are relevant here.

First, these researchers investigated the self-reported comfort of students in seeking library assistance while using library research tools including databases. Second, they found a significant increase in students' confidence of their abilities "to complete research in preparation for their assignments" (Zoellner et al., 2008, p. 377).

METHODS

Upon entering the university, students selecting a major offered in the College of Business (i.e. accounting, marketing, finance) are required to enroll in an introduction to business course in their first year, typically during the fall semester. This course, which is closed to non-freshmen, introduces students to the global business environment and various business disciplines. Furthermore, students in this class are instructed about resources available through the library within a business context to help them in their four years of college study.

The library instruction in the introduction to business course draws on the information literacy competency standards (ACRL, 2000) and includes desired learning outcomes for each of the five standards. During the lecture-based instruction, the librarian advises students to use specific library resources to complete a semester-long mock business project for which students identify, find, evaluate, and use business information to support their business decisions. Topics covered in this lecture include business databases, trade publications, and industry classification systems.

Business students usually take the subsequent introduction to financial accounting course in the fall semester of their sophomore year. This course is open to all students in the university regardless of college, major, or year in school. As a result, two distinct groups of students enroll in this accounting class: students who have

received the IL instruction in the introduction to business course during their first year and those students who have not received this training.

Participants

One hundred-twenty students enrolled in four sections of an introduction to financial accounting course volunteered to participate in this study. Data was collected in this class in the fall semesters of two consecutive academic years. No changes in the curriculum or the specific courses were made during this time frame (i.e. course materials, homework assignments, the library instruction in both the introduction to business class and the accounting class). The participants varied in their chosen colleges including liberal arts, education, pharmacy, fine arts, and business. All of the accounting material was taught in an identical manner by the same professor and the two librarians involved in the study provided the same IL instruction to each section. The responses from one hundred participants were used to analyze the data; the difference between the number of volunteers and usable responses is attributable to two factors, withdrawals from the course (ten students) and failure to take the post-test (ten students) because of non-attendance on the day it was administered. In terms of the two groups, fifty-eight students had previous IL instruction in the earlier introduction to business course and forty-two of the participants had not received this earlier training.

IL Instruction and Student Activities in Accounting

Between the completion of the pre-test at the beginning of the semester and the post-test administered near the end of the course, librarians provided identical IL instruction to all students in the accounting class. The training sessions and student exercises were developed in collaboration with the course professor to address specific

IL standards and performance indicators. The IL instruction involved demonstrations and hands-on training and was sub-divided into three sessions: two sessions emphasizing how to effectively identify, find, evaluate, and use resources for business research, and one session on the ethical use of information through proper citation of sources. The first session included instruction on identifying and using business research resources including several databases (i.e. Mergent Online, Key Business Ratios, Business Source Complete, and others) and a customized LibGuide (Williams, 2009). In the second session, the instructor and librarians guided students through a "hands-on" process to search for and retrieve information for a publicly-traded company and its industry. Students were encouraged to ask questions during this session and they completed a search log to document their investigation activities. The last module involved a brief training session on proper citing of business resources.

After each session, students were assigned a series of individual and small group activities to complete in class or as homework assignments to immediately reinforce the knowledge conveyed in the instruction. The instruction and associated activities were experiential in that students used the skills that the librarians taught in the instruction sessions to evaluate a potential investment in an actual public company. As their final assignment, student small groups of three to five students presented their investment decision supported by their research findings to class peers.

Pre-Test and Post-Test Questionnaires

Two questionnaires were drafted and administered to students at the beginning (Pre-Test) and at the end (Post-Test) of the introduction to financial accounting course. Both questionnaires collected information about the students' knowledge of accounting

concepts and library resources useful in evaluating a potential investment in a company. Students were instructed to select the correct response to each question and had the option of choosing “I don’t know” if they were unaware of the correct response. This inclusion was based on the literature which suggests that students will guess, often incorrectly, if they are not given the opportunity to indicate lack of knowledge regarding the appropriate response (Hill & Perdue, 2008). The Pre-Test data for some of these questions permits an investigation of knowledge retention of IL concepts from the time some of the participants completed the introduction to business course to their enrollment in the introduction to financial accounting course; this time period was usually a year. The Pre-Test questionnaire, which was not discussed with the students duing the semester, also gathered participant demographics.

The Post-Test questionnaire was given at the end of the accounting course and the questions regarding accounting concepts and library resources are identical to those on the Pre-Test. This latter questionnaire also includes additional questions regarding student perceptions of the benefits of course-integrated library instruction involving collaborations between business faculty and librarians.

Hypotheses and Research Questions

The first hypothesis (H1) anticipates students receiving instruction in the earlier business course (Business Course Group) will perform significantly better on the Pre-Test IL questions than students who had not received this instruction (Non-Business Course Group). Four questions were formulated in an attempt to test for this learning. The analysis examines significant differences in the proportions of students in each group answering the specific question correctly.

A second hypothesis (H2) speculates that the Non-Business Course Group will show a significantly greater improvement as compared with the Business Course Group from the Pre-Test to the Post-Test if the course-integrated instruction is successful. A related research question (RQ1) arises regarding the attainment of information literacy at the end of the accounting course related to course-integrated instruction. Specifically, will the Business Course Group perform significantly better than the Non-Business Course group at the end of the accounting course on the IL questions related to reinforcement of the earlier IL instruction?

A second research question (RQ2) investigates whether the perceptions of students regarding the benefits of the course-integrated library instruction will be significantly different for each of the two groups. Directional hypotheses were not proposed a priori because of the exploratory nature of the research question in this context.

Statistical Analysis

To obtain results on the comparison of two independent proportions for Hypothesis 1 and Research Question 1, the analysis utilizes the one-tailed *z* test because of the directional expectation that the Business Course Group will perform significantly better than the Non-Business Course Group. A comparison of two independent proportions using a two-tailed *z* test is employed for Research Question 2 because significant differences between the two groups were anticipated. For Hypothesis 2, a two-way cross-tabulation of group type (Business Course versus Non-Business Course) and response on the Pre-Test versus Post-Test is formulated to

facilitate a chi-square test for independence (Bowerman, O'Connell, Murphree, & Orris, 2012). P-values less than .05 are considered significant.

RESULTS

H1: The Business Course Group will perform significantly better on the Pre-Test IL questions than the Non-Business Course Group.

The results associated with the first hypothesis indicate that students receiving the instruction in the earlier introduction to business course performed better for three of the four IL questions on the Pre-Test than those students who had not received the previous IL training. Table 1 presents the student responses by question for the number of students and percentages of the total by Business Course Group and Non-Business Course Group. The correct responses to the questions are shown in bold print. IL questions #1 and #2 address the classification schemes for business entities established by the federal government for data collection and reporting purposes. IL question #1 inquires about the North American Industry Classification System (NAICS) designation and IL question #2 tests the students' knowledge about the Standard Industrial Classification (SIC) code. The third IL question investigates students' awareness of the business database which is a source for articles from trade publications. The fourth and final IL question relates to an online resource called LibGuides, which are created and maintained by librarians at the university.

[Insert Table 1 about here]

In testing for H1, the proportion of students answering each question correctly for the Business Course Group is compared with the Non-Business Course Group with the expectation that the former group will perform significantly better. Table 2 provides the results of this testing. The percentages of students who correctly knew the NAICS

acronym are 55.2 percent and 28.6 percent for the Business Course Group and the Non-Business Course Group, respectively, so that there is a significant difference between the groups (p = .0041). A surprising outcome occurred with respect to knowledge of SIC code. The two groups performed similarly with 37.9 percent of Business Course Group students and 33.3 percent of Non-Business Course Group students answering this question correctly. Therefore, the performance of the two groups is not significantly different at the .05 level.

The expected result was identified regarding students' awareness of the business database that is a source for articles from trade publications. The Business Course Group was quite knowledgeable with 63.8 percent of the students selecting the correct response, which is significantly higher than the corresponding 14.3 percent for the Non-Business Course Group ($p < .0001$). The proportion of students noting the correct answer on the Pre-Test for the fourth question on LibGuides was 91.4 percent for the Business Course Group, which is significantly higher than the 33.3 percent for the Non-Business Course group at the .05 level ($p < .0001$). The results for the four IL questions combined indicated that 62.1 percent of student-question combinations were answered correctly by the Business Course Group whereas only 27.4 percent of student-question combinations were correct for the Non-Business Course Group, yielding a significant difference between the two groups at $p < .0001$.

[Insert Table 2 about here]

H2: The Non-Business Course Group will show greater improvement as compared with the Business Course Group from the Pre-Test to the Post-Test on the IL questions.

It was expected that the Non-Business Group, having begun the introduction to financial accounting course with less knowledge, would show greater improvement

related to the course-integrated IL instruction that they received in the accounting course. An additional research question arose as this hypothesis was considered.

RQ1: Will the Business Course Group perform significantly better on the Post-Test IL questions than the Non-Business Course Group?

The first step in discussing the analysis with respect to H2 and RQ1 is to examine the student responses on the Post-Test for the IL questions. Table 3 shows the number of students and the percentage of the total number of students for each group associated with each response. The correct responses to the questions are again highlighted in bold print. Table 4 summarizes a comparison of the two groups on the differences in proportions of correct student responses from the Pre-Test to the Post-Test.

[Insert Table 3 about here]

According to Table 4, the percentage increase of 54.7% by the Non-Business Course Group for the correct response on the NAICS acronym (IL1) was higher than the corresponding increase of 41.4 percent by the Business Course Group; however, this improvement is not significantly greater at the .05 level. It is interesting to note that both groups improved their knowledge of SIC code (IL2) by similar percentages, 57.2 percent and 60.4 percent for the Non-Business Course Group and the Business Course Group, respectively. Therefore, this data indicates that the Non-Business Course Group did not experience a significantly greater improvement than the Business Course Group. In contrast to the first two IL questions, the anticipated results for the remaining two questions are realized. The Non-Business Course Group shows significantly greater improvement (p = .0049) on the business database question (IL3) with an increase of 59.5 percent in the number of students choosing the correct response as compared with

a 22.4 percent difference for the Business Course Group. The findings for the LibGuide IL question (IL4) are even more dramatic. Almost all of the students in the Business Course Group answered this question correctly on the Pre-Test and the Post-Test showing an improvement of only 3.4 percent. These results can be contrasted with the Non-Business Course Group where a 61.9 percent increase in the number of students selecting the correct response is found, resulting in a significance level of $p = .0048$. For the combination of all four IL questions, there was a significant difference between the two groups at the .05 level ($p = .0003$). The differences in the proportions of students responding correctly on the Post-Test versus the Pre-Test is 31.9 percent for the Business Course Group and 58.3 percent for the Non-Business Course Group.

[Insert Table 4 about here]

An analysis of the first research question (RQ1) regarding whether the Business Course Group performed better than the Non-Business Course Group on the IL questions at the end of the accounting course is presented in Table 5. The results indicate that the Business Course Group did perform significantly better than the Non-Business Course Group on IL questions #1 and #2 addressing the industry classification schemes established by the federal government for data collection and reporting purposes. IL question #1 on the NAICS designation shows that 96.6 percent and 83.3 percent of students in the Business Course Group and the Non-Business Course Group, respectively, correctly responded which is significant at $p = .0113$. IL question #2 on SIC code indicates that 98.3 percent of the Business Course Group and 90.5 percent of the Non-Business Course Group answered this question correctly which is significant at $p = .0387$.

The third IL question inquires about students' awareness of the business database, which is a source for articles from trade publications. The Business Course Group showed an improvement in their knowledge with 86.2 percent of the students selecting the correct response. The Non-Business Course Group also improved to 73.8 percent, thereby closing the gap between the two groups so that no significant difference between the two groups on this question at the .05 level is found on the Post-Test. The fourth IL question on LibGuides interestingly shows almost identical percentages of students in each group, around 95 percent, answering this question correctly. Hence, no significant difference between the two groups is found for this IL question on the Post-Test. Finally, the results for the four IL questions combined indicate that 94.0 percent of student-question combinations were answered correctly by the Business Course Group students whereas only 85.7 percent of student-question combinations had the correct response in the Non-Business Course Group yielding a significant difference between the two groups at the .05 level (p = .0027).

[Insert Table 5 about here]

RQ2: Are there significant differences in the perceptions of the benefits of course-integrated IL instruction between the two groups?

The perception questions utilize a five-point likert scale from 1 to 5 (1 = *strongly disagree* and 5 = *strongly agree*). For each of the individual perception questions on the benefits of course-integrated IL instruction, the Non-Business Course Group agreed more strongly than the Business Course Group. Table 6 presents the response information from the student subjects and Table 7 provides the significance testing results.

[Insert Table 6 about here]

Although the Non-Business Course Group agreed more strongly about the IL instruction benefits regarding Perception questions #1 and #2, there were no significant differences between the two groups at the .05 level. Both groups agreed on Perception question #1 that the library instruction sessions helped them to identify the information needed for the class assignments. The groups also agreed on Perception question #2 that their abilities to conduct company research improved over the semester.

Significant differences between the two groups emerge for the remaining three perception questions. Perception question #3 queries students about whether it is important for accounting professors to collaborate with librarians for instruction on business research resources. The mean response of 4.14 for the Non-Business Course Group was higher than the mean of 3.76 for Business Course Group, which is significant at p = .0268. Perception question #4 asks whether the students used resources for their research after the library instruction sessions that they would not have used otherwise. The Non-Business Course Group agreed significantly more strongly with a mean response of 4.48 compared with the mean of 3.93 for the Business Course Group (p = .0011). The Business Course Group was neutral (mean = 3.12) on Perception question #5 inquiring about whether the library session on citing was helpful in citing resources for class assignments. The mean of 3.60 for the Non-Business Course Group on this question was significantly higher at the .05 level (p = .0121). The summation of all five perception questions also shows a significant difference between the two groups at p = .0010, with the Non-Business Course Group agreeing more strongly than the Business Course Group that they benefited from the course-integrated IL instruction.

[Insert Table 7 about here]

DISCUSSION

For the first hypothesis, significantly better performance by the students receiving the IL instruction in the earlier business course was found for three of the four IL questions and for the combination of all four questions. The question on the SIC code classification scheme for business entities was the only question lacking significance. The proportion of students who answered this question correctly was similar, with a range of about thirty-three percent for the Non-Business Course Group to roughly thirty-eight percent for the Business Course Group. This latter percentage on the Pre-Test is substantially lower than for any of the other IL questions. The result is especially curious when coupled with the results from the first IL question on the NAICS acronym where about fifty-five percent of Business Course Group students answered the question correctly. These findings appear to impact the second hypothesis which is discussed in the following paragraph.

Recall that Hypothesis Two expects that students in the Non-Business Course Group will show a significantly greater improvement in their performance from the Pre-Test to the Post-Test. Both groups show similar low proportions of students responding correctly to the Pre-Test question on SIC code and all students received identical IL instruction in the introduction to financial accounting course. Furthermore, the Post-Test results reveal that almost all of the students in the Business Course Group responded correctly to this question (ninety-eight percent) whereas between ninety and ninety-one percent of students in the Non-Business Course Group selected the correct answer. These findings in concert suggest that once reminded, almost all of the

students receiving the IL instruction in the earlier introduction to business course (fifty-seven of fifty-eight) chose the correct response on the Post-Test.

The results of the Hypothesis 2 testing regarding the NAICS acronym question must also be mentioned here. As discussed in the RESULTS section, the Non-Business Course Group did improve more (about fifty-five percent difference) than the Business Course Group (approximately forty-one percent difference), although not significantly. These results should be viewed in conjunction with testing of the first research question which examines whether the Business Course Group will show significantly higher performance on their IL knowledge than the Non-Business Course Group at the end of the semester. This finding was realized; a significantly higher percentage of Business Course Group students (about ninety-seven percent) selected the correct response of NAICS on the Post-Test as compared with the students in the Non-Business Course Group (only eighty-three percent). The results associated with NAICS and SIC suggest that reinforcement of concepts used for business research in subsequent coursework may be helpful to some students for retention of that knowledge.

The second research question considered the perceptions of students regarding the benefits of course-integrated IL instruction and whether significant differences between the two groups would emerge. The Non-Business Course Group agreed more strongly about the benefits of this instruction type for each perception question although their responses were significantly different from the Business Course Group for three of the five questions. It is important to specifically discuss two of the questions showing significant differences. Regarding the importance of collaborations between accounting

faculty and business librarians, students from the Non-Business Course Group averaged a response slightly higher than Agree. Perhaps students in this group perceived that IL learning actually took place in the accounting course because they had begun the course with less knowledge and both the professor and librarians were actively involved in the instruction and the assignments throughout the semester. With respect to the application value of the IL instruction, almost all (forty of forty-two students) in the Non-Business Course Group answered Strongly Agree or Agree that they used library resources for their research after the library instruction sessions. This finding suggests that these students may have relied more heavily than the Business Course Group on the IL instruction that they received in the accounting course to complete their assignments.

SUMMARY AND CONCLUSIONS

The results from this research investigation suggest that IL knowledge and skills taught in an introduction to business course can be learned and applied in a subsequent introduction to financial accounting course. Furthermore, students receiving this instruction in the earlier business course performed significantly better than students who had not received this training. Some evidence suggests that repetition may be helpful for specific concepts, such as acronyms used for industry classification, and students, once reminded, are able to show retention of knowledge that extends beyond the current semester.

In addition, this study explores the perceptions of students regarding the benefits of course-integrated IL instruction. Students who had not received the earlier instruction showed significantly greater agreement about the importance of in-class collaborations

between accounting faculty and business librarians. They also agreed significantly more strongly that they used resources for their research after the IL instruction sessions.

Limitations of this research effort include a relatively small sample size and participants from a single university in a specific geographical area. Furthermore, variables other than the specific IL instruction provided to the students in this study may have contributed to the students' performance on the Pre- and Post-Test, as well as their retention. These potential confounding variables include IL instruction in other courses, innate student ability, peer interaction, and students' not taking the questionnaires seriously. There is an opportunity for future research into the impact of these variables. In addition, it is unknown whether the self-reported perceptions by students in this study are representative of all students who receive course-integrated IL instruction.

REFERENCES

Association of College and Research Libraries. (2000). *Information literacy competency standards for higher education*. Retrieved October 11, 2010 from http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm#stan

Atwong, C. T. & Heichman Taylor, L.J. (2008). Integrating information literacy into business education: A successful case of faculty-librarian collaboration. *Journal of Business & Finance Librarianship, 13*(4), 433-449.

Bowerman, B. L., O'Connell, R. T., Murphree, E. S., & Orris, J. B. (2012). *Essentials of business statistics* (4th ed.). New York: The McGraw-Hill Companies, Inc.

Bowers, C. V. M., Chew, B., Bowers, M. R., Ford, C. E., Smith, C. & Herrington, C. (2009). Interdisciplinary synergy: A partnership between business and library faculty and its effects on students' information literacy. *Journal of Business & Finance Librarianship, 14*(2), 110-127.

Cheuk, B. (2002). Information literacy in the workplace context: Issues, best practices and challenges. White paper prepared for UNESCO, the U.S. National Commission on Libraries and Information Science, and the National Forum on Information Literacy, for use at the Information Literacy Meeting of Experts, Prague, The Czech Republic.

Cooney, M. (2005). Business information literacy instruction: A survey and progress report. *Journal of Business & Finance Librarianship*, *11*(1), 3-25.

Cunningham, N. A., & Anderson, S. C. (2005). A bridge to FARS and information literacy for accounting undergraduates. *Journal of Business & Finance Librarianship*, *10*(3), 3-16.

Gabbin, A. L. (2002, April). The crisis in accounting education. *Journal of Accountancy*, *193*(4), 81-86.

Hawes, D. K. (1994). Information literacy and the business schools. *Journal of Education for Business*, *70*(1), 54-61.

Hill, R. R., & Perdue, G. (2008). A methodological issue in the measurement of financial literacy. *Journal of Economics & Economic Education Research*, *9*(2), 43-59.

Jackson, S., & Durkee, D. (2008). Incorporating information literacy into the accounting curriculum. *Accounting Education*, *17*(1), 83-97.

Kobelski, P., & Reichel, M. (1981). Conceptual frameworks for bibliographic instruction. *Journal of Academic Librarianship*, *7*(2), 73.

Lieberthal, S. P. (2009). Teaching undergraduate business students to access public company information: Assessing students' use of library resources. *Journal of Business & Finance Librarianship*, *14*(3), 230-247.

MacMillan, M. (2009). Watching learning happen: Results of a longitudinal study of journalism students. *Journal of Academic Librarianship*, *35*(2), 132-142.

Murphy, E. A., & Hoeppner, C. J. (2002). Using technology and library resources in financial accounting courses. *Journal of Accounting Education*, *20*(4), 331.

O'Keeffe, J. (1998). One step at a time: a framework for introducing business students to basic sources of company and industry data, *Research Strategies*, *16*(1), 71-77.

Orme, W. A. (2004). A study of the residual impact of the Texas Information Literacy Tutorial on the information-seeking ability of first year college students, *College & Research Libraries*, *65*(3), 205-15.

Reichel, M & Ramey, M. (Eds.) (1987). *Conceptual Frameworks for Bibliographic Education: Theory into Practice*. Littleton, Colo: Libraries Unlimited.

Rutledge, D. P., & Maehler, A. (2003). An assessment of library education contributions to business student learning: A case study. *Journal of Business & Finance Librarianship*, *9*(1), 3-19.

St. Pierre, K., Wilson, R. M. S., Ravenscroft, S. P., & Rebele, J. E. (2009, May). The role of accounting education research in our discipline-An editorial. *Issues in Accounting Education*, *24*(2), 123-130.

Simon, C. (2009). Graduate business students and business information literacy: A novel approach. *Journal of Business & Finance Librarianship*, *14*(3), 248-267.

Williams, T. (2009). Resources & tips for group company project. *Butler University Libraries LibGuides*. Retrieved April 27, 2011 from http://libguides.butler.edu/KellyAC203

Wong, G., Chan, D., & Chu, S. (2006). Assessing the enduring impact of library instruction programs. *Journal of Academic Librarianship*, *32*(4), 384-895.

Zabel, D. (2004). A reaction to "Information literacy and higher education." *The Journal of Academic Librarianship*, *30*(1), 17-21.

Zoellner, K., Samson, S., & Hines, S. (2008). Continuing assessment of library instruction to undergraduates: A general education course survey research project, *College & Research Libraries*, *69*(4), 370-83.

Table 1

Student Pre-Test Responses to the Information Literacy Questions

	Business Course Group		Non-Business Course Group	
	Number of Students	Proportion of Students	Number of Students	Proportion of Students
IL1: The federal government has adopted standards for classifying business establishments. Each type of establishment is assigned a numerical code which is used for data collection and reporting purposes. Which of the following is the acronym for this code?				
A. FASB	11	19.0	17	40.5
B. NASDAQ	3	5.2	4	9.5
C. NAICS	**32**	**55.2**	**12**	**28.6**
D. None of the above	3	5.2	1	2.4
E. I don't know	9	15.5	8	19.0
	58		42	
IL2: Prior to 1997, the federal government used another coding system to classify business establishments. This older code is still used in some business research databases. Which of the following is the acronym for this code?				
A. ASCII	4	6.9	4	9.5
B. IRB	5	8.6	4	9.5
C. SIC	**22**	**37.9**	**14**	**33.3**
D. None of the above	2	3.4	1	2.4
E. I don't know	25	43.1	19	45.2
	58		42	
IL3: You will often find articles on industry trends in a trade publication. Which of these business databases is a source for articles from trade publications?				
A. Business Source Complete	**37**	**63.8**	**6**	**14.3**
B. International Financial Statistics	0	0.0	7	16.7
C. Accounting Research Manager	1	1.7	3	7.1
D. All of the above	10	17.2	11	26.2
E. I don't know	10	17.2	15	35.7
	58		42	
IL4: In addition to databases, the University Libraries offer another online resource for assisting with business research. What is the name of this resource?				
A. Statistical Abstracts	1	1.7	3	7.1
B. Research Log	0	0.0	2	4.8
C. Pathfinder	0	0.0	7	16.7
D. LibGuides	**53**	**91.4**	**14**	**33.3**
E. I don't know	4	6.9	16	38.1
	58		42	

The correct response is shown in **bold print**.

Table 2

Correct and Incorrect Pre-Test Responses to the Information Literacy Questions

	Business Course Group		Non-Business Course Group	
	Number of Students	Percentage of Students	Number of Students	Percentage of Students
IL1: The federal government has adopted standards for classifying business establishments. Each type of establishment is assigned a numerical code which is used for data collection and reporting purposes. Which of the following is the acronym for this code?				
Correct Response	32	55.2	12	28.6
Incorrect Response	26	44.8	30	71.4
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	**0.0041**			
IL2: Prior to 1997, the federal government used another coding system to classify business establishments. This older code is still used in some business research databases. Which of the following is the acronym for this code?				
Correct Response	22	37.9	14	33.3
Incorrect Response	36	62.1	28	66.7
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	0.3182			
IL3: You will often find articles on industry trends in a trade publication. Which of these business databases is a source for articles from trade publications?				
Correct Response	37	63.8	6	14.3
Incorrect Response	21	36.2	36	85.7
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	**0.0000**			
IL4: In addition to databases, the University Libraries offer another online resource for assisting with business research. What is the name of this resource?				
Correct Response	53	91.4	14	33.3
Incorrect Response	5	8.6	28	66.7
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	**0.0000**			
Combination of all four information literacy questions.				
Correct Response	144	62.1	46	27.4
Incorrect Responses	88	37.9	122	72.6
Total Responses	232	100.0	168	100.0
Significance Level (p-value)	**0.0000**			

Significance at the .05 level is shown in **bold print**.

Table 3

Student Post-Test Responses to the Information Literacy Questions

	Business Course Group		Non-Business Course Group	
	Number of Students	Proportion of Students	Number of Students	Proportion of Students
IL1: The federal government has adopted standards for classifying business establishments. Each type of establishment is assigned a numerical code which is used for data collection and reporting purposes. Which of the following is the acronym for this code?				
A. FASB	1	1.7	3	7.1
B. NASDAQ	0	0.0	2	4.8
C. NAICS	**56**	**96.6**	**35**	**83.3**
D. None of the above	0	0.0	2	4.8
E. I don't know	1	1.7	0	0.0
	58		42	
IL2: Prior to 1997, the federal government used another coding system to classify business establishments. This older code is still used in some business research databases. Which of the following is the acronym for this code?				
A. ASCII	0	0.0	1	2.4
B. IRB	0	0.0	0	0.0
C. SIC	**57**	**98.3**	**38**	**90.5**
D. None of the above	1	1.7	0	0.0
E. I don't know	0	0.0	3	7.1
	58		42	
IL3: You will often find articles on industry trends in a trade publication. Which of these business databases is a source for articles from trade publications?				
A. Business Source Complete	**50**	**86.2**	**31**	**73.8**
B. International Financial Statistics	0	0.0	0	0.0
C. Accounting Research Manager	0	0.0	0	0.0
D. All of the above	2	3.4	5	11.9
E. I don't know	6	10.3	6	14.3
	58		42	
IL4: In addition to databases, the University Libraries offer another online resource for assisting with business research. What is the name of this resource?				
A. Statistical Abstracts	0	0.0	0	0.0
B. Research Log	0	0.0	0	0.0
C. Pathfinder	2	3.4	0	0.0
D. LibGuides	**55**	**94.8**	**40**	**95.2**
E. I don't know	1	1.7	2	4.8
	58		42	

The correct response is shown in **bold print**.

Table 4

Improvement on the Information Literacy Questions

Pre-Test to Post-Test

	Business Course Group			Non-Business Course Group		
	Pre-Test	Post-Test	Difference	Pre-Test	Post-Test	Difference
IL1: The federal government has adopted standards for classifying business establishments. Each type of establishment is assigned a numerical code which is used for data collection and reporting purposes. Which of the following is the acronym for this code?						
Number of Correct Responses	32	56		12	35	
Total Number of Responses	58	58		42	42	
Correct as a Percentage of Total	55.2%	96.6%	41.4%	28.6%	83.3%	54.7%
Significance Level (p-value)	0.2009					
IL2: Prior to 1997, the federal government used another coding system to classify business establishments. This older code is still used in some business research databases. Which of the following is the acronym for this code?						
Number of Correct Responses	22	57		14	38	
Total Number of Responses	58	58		42	42	
Correct as a Percentage of Total	37.9%	98.3%	60.4%	33.3%	90.5%	57.2%
Significance Level (p-value)	0.9076					
IL3: You will often find articles on industry trends in a trade publication. Which of these business databases is a source for articles from trade publications?						
Number of Correct Responses	37	50		6	31	
Total Number of Responses	58	58		42	42	
Correct as a Percentage of Total	63.8%	86.2%	22.4%	14.3%	73.8%	59.5%
Significance Level (p-value)	**0.0049**					
IL4: In addition to databases, the University Libraries offer another online resource for assisting with business research. What is the name of this resource?						
Number of Correct Responses	53	55		14	40	
Total Number of Responses	58	58		42	42	
Correct as a Percentage of Total	91.4%	94.8%	3.4%	33.3%	95.2%	61.9%
Significance Level (p-value)	**0.0048**					
Combination of all four information literacy questions.						
Number of Correct Responses	144	218		46	144	
Total Number of Responses	232	232		168	168	
Correct as a Percentage of Total	62.1%	94.0%	31.9%	27.4%	85.7%	58.3%
Significance Level (p-value)	**0.0003**					

Significance at the .05 level is shown in **bold print**.

Table 5

Correct and Incorrect Post-Test Responses to the Information Literacy Questions

	Business Course Group		Non-Business Course Group	
	Number of Students	Proportion of Students	Number of Students	Proportion of Students
IL1: The federal government has adopted standards for classifying business establishments. Each type of establishment is assigned a numerical code which is used for data collection and reporting purposes. Which of the following is the acronym for this code?				
Correct Response	56	96.6	35	83.3
Incorrect Response	2	3.4	7	16.7
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	**0.0113**			
IL2: Prior to 1997, the federal government used another coding system to classify business establishments. This older code is still used in some business research databases. Which of the following is the acronym for this code?				
Correct Response	57	98.3	38	90.5
Incorrect Response	1	1.7	4	9.5
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	**0.0387**			
IL3: You will often find articles on industry trends in a trade publication. Which of these business databases is a source for articles from trade publications?				
Correct Response	50	86.2	31	73.8
Incorrect Response	8	13.8	11	26.2
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	0.0594			
IL4: In addition to databases, the University Libraries offer another online resource for assisting with business research. What is the name of this resource?				
Correct Response	55	94.8	40	95.2
Incorrect Response	3	5.2	2	4.8
Total Responses	58	100.0	42	100.0
Significance Level (p-value)	0.5370			
Combination of all four information literacy questions.				
Correct Response	218	94.0	144	85.7
Incorrect Responses	14	6.0	24	14.3
Total Responses	232	100.0	168	100.0
Significance Level (p-value)	**0.0027**			

Significance at the .05 level is shown in **bold print**.

Table 6
Student Responses to the Perception Questions

	Business Course Group		Non-Business Course Group	
	Number of Students	Proportion of Students	Number of Students	Proportion of Students
P1: The library instruction sessions helped me identify the information I needed for my class assignments.				
A. Strongly Agree	15	25.9	18	42.9
B. Agree	34	58.6	20	47.6
C. Neutral	7	12.1	4	9.5
D. Disagree	1	1.7	0	0.0
E. Strongly Disagree	1	1.7	0	0.0
	58		42	
P2: My ability to conduct company research improved over the semester.				
A. Strongly Agree	22	37.9	22	52.4
B. Agree	31	53.4	18	42.9
C. Neutral	5	8.6	1	2.4
D. Disagree	0	0.0	1	2.4
E. Strongly Disagree	0	0.0	0	0.0
	58		42	
P3: It is important for accounting professors to collaborate with librarians for instruction on business research resources.				
A. Strongly Agree	8	13.8	15	35.7
B. Agree	35	60.3	19	45.2
C. Neutral	10	17.2	7	16.7
D. Disagree	3	5.2	1	2.4
E. Strongly Disagree	2	3.4	0	0.0
	58		42	
P4: After the library instruction sessions, I used resources for my research that I would not have used otherwise.				
A. Strongly Agree	16	27.6	23	54.8
B. Agree	26	44.8	17	40.5
C. Neutral	12	20.7	1	2.4
D. Disagree	4	6.9	1	2.4
E. Strongly Disagree	0	0.0	0	0.0
	58		42	
P5: The library session on citing helped me cite resources for my class assignments.				
A. Strongly Agree	3	5.2	4	9.5
B. Agree	19	32.8	20	47.6
C. Neutral	23	39.7	15	35.7
D. Disagree	8	13.8	3	7.2
E. Strongly Disagree	5	8.6	0	0.0
	58		42	

Table 7

Significance Testing of the Student Perception Questions

		Business Course Group N = 58	Non-Business Course Group N = 42
P1: The library instruction sessions helped me identify the information I needed for my class assignments.			
Mean value		4.05	4.33
Standard deviation		0.78	0.65
Significance Level (p-value)	0.0597		
P2: My ability to conduct company research improved over the semester.			
Mean value		4.29	4.45
Standard deviation		0.62	0.67
Significance Level (p-value)	0.2239		
P3: It is important for accounting professors to collaborate with librarians for instruction on business research resources.			
Mean value		3.76	4.14
Standard deviation		0.88	0.78
Significance Level (p-value)	**0.0268**		
P4: After the library instruction sessions, I used resources for my research that I would not have used otherwise.			
Mean value		3.93	4.48
Standard deviation		0.88	0.67
Significance Level (p-value)	**0.0011**		
P5: The library session on citing helped me cite resources for my class assignments.			
Mean value		3.12	3.60
Standard deviation		1.01	0.77
Significance Level (p-value)	**0.0121**		
Summation of all five perception questions.			
Mean value		19.16	21.00
Standard deviation		2.96	2.25
Significance Level (p-value)	**0.0010**		

Scaling: Strongly Agree = 5; Agree = 4; Neutral = 3; Disagree = 2; Strongly Disagree = 1

Significance at the .05 level is shown in **bold print**.