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INFORMATION LITERACY FOR MULTIPLE DISCIPLINES

Toward a campus-wide integration model at Indiana University, Bloomington

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ABSTRACT

Within disciplines are a set of shared values and thought processes that students must master in order to become participants of that discipline. Information literacy as defined by the ACRL is a set of standards and principles that can apply to all disciplines. In order to produce information literate undergraduates in a given discipline, information literacy standards must be integrated with the values and processes of the discipline. In this study, librarians partnered with faculty in gender studies and molecular biology to integrate information literacy with courses in those areas. Student performance and attitudes improved as a result of the collaboration. This article discusses the collaboration process, the assessment methods and results, and the long-term importance of developing best practices for information literacy integration at the campus level through a disciplinary approach.

INTRODUCTION

The libraries at Indiana University (IU) have a strong tradition of engagement in information literacy education. As early as 1996, IU librarians had developed a detailed plan for information literacy assessment. The plan was never published publicly and never implemented to any great degree, but its existence speaks to the level of enthusiasm for information literacy that IU librarians shared with many colleagues around the world. In the 10 years since the establishment of the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education (ACRL, 2000), many academic libraries have worked toward incorporation of the standards and the principles they represent into the educational fabric of their institutions. At IU, this has been most evident in the marked increase in instructional activities. In fact, until recently, library instruction has been viewed as the primary (if not the only) vehicle for applying information literacy standards. This view of instruction and information literacy now seems too narrow, and, in some ways, has possibly kept information literacy from being integrated more deeply in the university's curriculum. However, progress has been made in recent years at IU to make information literacy not just a key ingredient of library instruction, but an important pedagogical approach that can be applied to a variety of disciplines with very positive effects.

One major development at IU that has encouraged this recent progress was the approval of a new General Education Policy that affects all new undergraduates starting in 2011. The bulk of the policy relates to requiring a minimum number of credit hours in areas of humanities, math, and science, but one portion of the policy, called "Shared

Goals," encourages schools and programs to incorporate things like intensive writing, diversity, service learning, and information fluency. The Shared Goal of Information Fluency is presented in the following way:

Information Fluency includes, but goes beyond, information technology skills, to introduce students to critical information resources that underlie the major field of study and introduce students to skills in utilizing information resources within that field. Students should be able to determine the extent of information needed, access the needed information effectively and efficiently, evaluate information and its sources critically, incorporate selected information into one's knowledge base, use information effectively to accomplish a specific purpose, and understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally. (Indiana University, Information Fluency)

Obviously, the language of the policy is a summary of the ACRL Information Literacy Competency Standards (ACRL, 2000). While the Shared Goals are not a required component of the General Education, they are expected to be adapted and implemented by each program or school, and an assessment expected at some point in the future. So, essentially, regardless the name, information literacy is what will be implemented and assessed. The development of the policy, and specifically the Information Fluency goal, presents two very exciting but challenging opportunities for the IU libraries. As information literacy education is still primarily the domain of librarians, there is an opportunity for

librarians to assert their expertise in a new and meaningful way on campus by acting as chief consultants for its implementation. Likewise, with the substantial body of knowledge on information literacy assessment available, information literacy implementation is now best approached with assessment at the forefront of the planning and development stages.

The greatest challenge to capitalizing on these opportunities is to develop models for implementation and assessment that are both effective and sustainable. It is a common and logical assertion that information literacy standards bear greater meaning the more contextualized they are when applied to specific disciplines. Teaching the standards as stand-alone skills that can be applied in any context has merit, but establishing connections between the information literacy standards and specific course syllabi and assignments allows librarians to approach large-scale implementation of information literacy across disciplines and courses in a consistent manner based on evidence (VanScoy & Oakleaf, 2008). While effectiveness seems to increase with deeper contextualization, it can require increased time and effort from librarians, who are already limited in number and time to devote to such activities. However, this assertion is based on the assumption that more information literacy education means more library instruction sessions taught by librarians. To develop effective and sustainable models, it will be necessary to envision a plan to integrate information literacy with courses and curricula on campus in a way that does not require librarians to be present and responsible for its packaging and dissemination every step of the way.

To begin the process of building a model for

campus-wide implementation and assessment, the authors applied for and were awarded a small grant by the IU Scholarship of Teaching and Learning group to investigate integrating information literacy with undergraduate courses in two different disciplines, gender studies and molecular biology. The majority of the funds were distributed to the teaching faculty as an award for their participation, while the remaining amounts were dedicated to employing a part-time graduate student from the School of Education to assist with assignment and assessment development and implementation. While these disciplines (like all academic disciplines) certainly have some things in common structurally, the nature and logic of each is different enough to make them suitable areas for study and comparison. Central to this study was the determination of the authors to apply the ACRL information literacy standards to each discipline as opposed to developing or using pre-developed discipline-specific standards. The rationale for this was that developing unique standards for multiple programs on campus would not be feasible or sustainable. Also, the traditional ACRL standards were intended to be adaptable by design, and the authors intended to demonstrate that. Specific research objectives of the study included:

- identifying courses in the disciplines that would serve as good models;
- working with instructors to determine specific information needs of students;
- working with instructors to revise course syllabi and design appropriate exercises and assignments;
- co-teaching the courses, assessing student learning, and documenting the instructors' evaluation of

student learning and the integration process itself.

BACKGROUND

Information literacy integration is most effective when it is performed in the context of a specific discipline, and Ann Grafstein's article on the subject stands as a pillar of reason to support this assertion (Grafstein, 2002). She successfully argues that critical thinking and lifelong learning are already goals of most disciplines and the liberal arts in general, so information literacy naturally complements educational approaches in those areas. One key component to Grafstein's work is the insistence that librarians cannot be the sole purveyors of information literacy and that collaboration and buy-in from all parties is essential to make information literacy education effective. Perhaps her most important argument, though, is that separating the information literacy process from the content of a discipline risks losing meaning and context. Her positions are eloquently and succinctly summarized in the following excerpt:

Broadly speaking, research is conducted differently in the humanities, the social sciences, the physical sciences, and the formal sciences (i.e., mathematics and logic). Critical thinking, moreover, does not take place in a vacuum. There are essential aspects of the ability to think critically that develop within the context of an understanding of the research concerns in particular disciplines. An understanding of the discipline, and not simply abstract critical thinking skills, is what provides students with the tools to evaluate research critically in that discipline.

More detailed studies on collaboration support Grafstein's assertions regarding the importance of collaboration. Lindstrom described a model for collaboration that includes librarians co-teaching, being involved in learning communities, and, perhaps most importantly, staying involved in campus-wide conversations about information literacy (Lindstrom & Shonrock, 2006).

There are also studies on information literacy integration with specific disciplines that strengthen the argument for a discipline-specific approach. For the sciences, Manuel makes a strong case by comparing information literacy standards to national standards for science education (2004). The overlap between the goals of the two sets of standards does not imply redundancy; rather it speaks to the complementary nature of the standards. Indeed, when viewed as a process, information literacy standards bear a striking resemblance to the process of science itself. Recent studies at Indiana University where information literacy standards were used as a process to guide undergraduates through the steps of writing research proposals support this (Petzold, Winterman, & Montooth, 2010; Winterman, 2009). Another study by Gehring and Eastman combined information literacy with inquiry-based learning to improve students' abilities to find and use information and to understand how those skills are important to their coursework (2008).

There has been little research on discipline-specific information literacy instruction for gender studies. This could be because of the interdisciplinary nature of the field or the relative newness of gender studies as an academic field. Existing literature seems to advocate the embedded model (Bell & Benedicto, 1998; Bowler & Street, 2008; Goetsch, 1989; Weeg, 1997), in which the

librarian plays an active, integrated role in the course or have a librarian teach a for-credit information literacy course (Wilkinson, 2004, 2006), rather than specific strategies or techniques. In each of these cases, it seems that there is potential for a librarian to play a key role in developing information literacy skills for the discipline-specific needs within gender studies.

In order to develop the most effective model for integrating information literacy campus-wide at Indiana University, it is evident that taking a discipline-based approach is a logical choice. Whether the ACRL standards can be effectively applied as they are to all or most academic disciplines is an important question. The standards appear to be adaptable by design, and the authors claim them to be “common” to all disciplines; but the following excerpt from the section, “Use of the Standards,” seems to anticipate the question:

Some disciplines may place greater emphasis on the mastery of competencies at certain points in the process, and therefore certain competencies would receive greater weight than others in any rubric for measurement.

Other language in the document also implies an understanding that the standards, their objectives, and their outcomes can be selected and applied as appropriate, depending on the teaching and learning needs of the academic discipline and the academic level of the student. For example, the discussion of “higher order” and “lower order” thinking skills in the assessment section of the document, while stressing the importance of considering these skills in designing an appropriate assessment plan, does not dictate that these outcomes be

sought in any linear or chronological order. Again, this flexibility implies an acknowledgement that some customization will be a natural part of any integration process. By implementing this study in a social science (gender studies) and a hard science (biology), the intention of the researchers was to demonstrate that, while research competencies vary among disciplines, the librarian’s contribution to facilitating and guiding the implementation of information literacy education into various courses can follow a similar model. In this case, the fundamental element of success is the librarian’s collaboration with a faculty member, the incorporation of information literacy standards in a variety of assignments that allow learners to build on prior knowledge, and the building of assessments that measure students’ understanding of information seeking, evaluation, and use. While both librarians implemented these strategies differently based on the disciplinary nature of each course’s content and goals, the ACRL standards established a common framework that governed both approaches.

The single greatest campus-wide implementation of information literacy education across the curriculum was achieved by the California State University System with its Information Competence Initiative (Rockman, 2003) that supported collaborative efforts between librarians and faculty to bring about broad curricular changes. While these changes occurred at the course level, it was the original ACRL Information Literacy Competency Standards, rather than a discipline-specific revision of them, that provided the framework for implementation. Still, there have been efforts to revise the ACRL standards to address the needs of specific disciplines. The ALA/ACRL/STS Task Force on Information Literacy for Science

and Technology developed the Information Literacy Standards for Science and Engineering/Technology (<http://www.ala.org/ala/mgrps/divs/acrl/standards/infolitscitech.cfm>) which states, “Science, engineering, and technology disciplines pose unique challenges in identifying, evaluating, acquiring and using information.” While this is undoubtedly true for these broad subject areas, it is also true for more specific disciplines within these areas and beyond. Developing specific standards for different subject areas may be unnecessary and, moreover, may be redundant with any adaptations that occur during integration. To move forward with a campus-wide integration initiative that is sustainable and assessable, it will be important to develop a model based on the ACRL standards that is adaptable to all or most disciplines.

Context of the Collaboration

The authors, a gender studies librarian and a biology librarian, identified professors in their respective subject areas with whom to collaborate. The choice of collaborator was guided partially by identifying an appropriate course in which the partnership would take place and partially by the level of willingness on the part of the professor to collaborate. It was imperative to work with professors who were willing to accommodate full integration of information literacy principles as opposed to simply allowing library components to be added to the schedule. After identifying willing partners early in 2008, planning began for integration and assessment to take place during the fall semester.

The biology librarian partnered with a molecular biologist who teaches a 3-credit hour course on writing in molecular biology (L322). The course is aimed at juniors and seniors majoring in biology and is designed

to develop logic, rhetoric, and writing skills in molecular biology. Students are taught to outline, draft, and revise several different document types over the course of the semester, including essays, review articles, and book chapters.

The course seemed ideal for information literacy integration for several reasons. First, the nature of the course work requires students to gather, evaluate, and synthesize information from a number of different sources in order to complete the writing assignments. Information literacy principles could complement and enhance that process seamlessly. Second, because the students are juniors and seniors, they have enough laboratory and lecture experience in biology to read and synthesize biology information at a higher level than freshman or sophomores. Finally, the professor is a highly accomplished scientist, author, and teacher in molecular biology; and he had originally designed the course with input from other groups on campus related to writing support and teaching innovation. His expertise and his openness to improved teaching and learning seemed a perfect combination for the project. Learning outcomes for the course remained much the same as they were before information literacy integration: for students to demonstrate the ability to read, analyze, and author literature in the discipline at a level that should be expected of a graduate student in the discipline. The information literacy integration was intended to augment and enhance the achievement of reaching those outcomes.

The gender studies librarian partnered with a professor to conduct research in the 300-level course, G300: Core Concepts and Key Debates, for the gender studies major at Indiana University. In G300, the gateway course to the major, students explore a

series of themes through which gender is discussed, analyzed, and defined. Conceptual frameworks of gender, theories of sexuality, and the cultural and historical construction of the body are emphasized. The course builds on ways of thinking about gender that students are likely to have encountered in introductory courses and hones their command of gender as an analytic framework and a dynamic field of study. For this writing intensive course, students write three short essays (3-5 pages, 5-7 pages revised) and one long essay (8-10 pages, 11-14 pages revised), resulting in a portfolio of research and writing. There are 25 students in the course, and most are gender studies majors. The information literacy integration for this course involved two major research assignments designed to encourage the use and understanding of primary and secondary sources for scholarly inquiry and one non-writing, discussion-based assignment.

METHODS

Case 1: Molecular Biology

During the semester before the class started, the librarian and professor met multiple times to plan for the collaboration. They first examined course goals, assignments, and timelines, then began discussing the details of integrating information literacy. Previous offerings of the course had required students to write reviews of articles and book chapters, but the topics were prescribed. So, it was decided to incorporate a research proposal writing assignment with students developing their own topics to act as the primary vehicle for teaching information literacy skills. There were two major reasons for this decision. First, the process of developing a topic requires certain information literacy skills by itself and also allows the students to engage in a topic that is personally or professionally interesting to them. Second, when

TABLE 1 — PROCESS OF WRITING A RESEARCH PROPOSAL

ACRL Information Literacy Standard	Research Proposal Process
Determine the extent of information needed	Students start with a topic of interest and develop a strategy for exploring specific types of information.
Access needed information effectively and efficiently	Students use appropriate resources effectively to perform nearly exhaustive searches on their topics and acquire the full text of articles.
Evaluate information and its sources critically and incorporate it into one's knowledge base	Students evaluate the value of primary and secondary literature in supporting or disproving aspects of their research topics; students synthesize information in order to identify a gap in research.
Use information effectively to accomplish a specific purpose	Students write research proposals in the appropriate format and orally explain and defend their proposals.
Understand the economic, legal, and social issues surrounding the use of information	Students discuss plagiarism and learn how and when to cite sources in the appropriate style.

information literacy standards are viewed as a somewhat linear or cyclical process, they match very well with the process of writing a research proposal (see Table 1).

In the fall of 2008, the course began with 25 students, the maximum allowed in the class, and met twice per week for 75 minutes. While the professor led most lectures, the librarian was present for each meeting and contributed as appropriate. The professor emphasized to the students from the beginning that the librarian was a co-instructor, and he encouraged them to contact the librarian with any relevant questions or concerns just as they would him. The librarian officially led a total of six meetings, though he did discuss information literacy on the first day of class and explained its relevance to the course goals. The first of the official librarian-led lectures was early in the semester (around week 3) and included a presentation of information resources and hands-on exercises in which students practiced search techniques. This lecture was not only intended to prepare students for work on their research proposals later in the semester, but also to prepare them for other writing assignments in the class. Around the semester midpoint, the librarian presented the research proposal assignment and timeline to the students and began to work with them one-on-one outside of class to help them develop their topics and information strategies. The remaining librarian-led lectures were consecutive, starting around week 12 of the semester, and covered the purpose and structure of the research proposal. In-class activities included review of research proposal examples, discussion of the different parts of the proposal and their purpose, and students reviewing and editing each other's drafts. After these meetings, the students had 2 weeks to refine their work, meet with

the professor or librarian for consultation, and turn in their final drafts.

Learning outcomes for information literacy were assessed using both qualitative and quantitative methods for the courses involved in this study; however, all students received the same instruction and participated in the same course assignments and assessments. While establishing a control group would have been an effective means of making comparisons to measure student learning, the investigators wanted all students to benefit from the opportunity to engage in coursework enhanced with information literacy knowledge. The following describes the assessment methods and their purpose.

Assessment

Pre- and Post-Test Survey

A survey (see Appendix A) was administered at the beginning and end of the course to measure basic information literacy skills as well as self-perceptions about writing and scientific thinking. There were three qualitative questions to test the students' abilities to derive keywords from a research question and describe a search strategy. Also, there were nine multiple choice questions with one best answer to test knowledge of information resources, search strategies, and understanding of the structure of information. Finally, there were four multiple choice questions that asked students to rank their abilities to find information, comprehend literature, and communicate as a scientist.

Portfolio Reviews

The professor met with students throughout the semester to review their work and their overall progress. As part of this process, students were asked to describe what they liked best and least about the course work. These reports were analyzed and tabulated.

Results

Pre- and Post-Test Survey

The first three questions were demographic in nature. The majority of students were seniors (12) and juniors (6), and all were majors in biology, biotechnology, biochemistry, or chemistry. When asked about future plans, six planned to attend medical school, seven planned to attend graduate school, and the rest were divided among nursing school, law school, dental school, and “undecided.” The next nine questions were multiple-choice with only one correct answer and tested basic information skills such as ability to distinguish appropriate resources and identifying the purpose of and use resources. The results of these questions showed overall improvement between pre- and post-test, which was expected. The knowledge and skills tested in these questions were explicitly taught as part of the course content.

The next three questions were qualitative in nature and asked students to write a research question, develop a search string that they might use in a related search, and identify an appropriate strategy for the search including what resources to use. There was little change in the quality of research questions, partly because of the limited time to complete the survey and partly because it is not reasonable to expect an elaborate research question to be developed in the context of a survey. Nonetheless, the primary purpose of the research question was to provide material to answer the questionnaire’s next two questions. Overall, students showed a marked improvement in their abilities to develop a search string based on their research question by the end of the course. In the pre-test, natural language, lack of variety of keywords, and poor use of Boolean operators were prevalent. In the post-test, students

demonstrated a solid grasp of truncation, Boolean operators, and use of a variety of synonyms and similar concepts. Finally, student search strategies improved a great deal going from simple responses like “Google” or “library catalog” to specific journal indexes and document types, “browsing abstracts,” and revising search strings.

Perhaps the most interesting changes between pre- and post-test appeared in the four self-ranking questions. While self-ranking responses cannot necessarily be expected to reflect actual learning, they may offer an important view of students’ confidence in their own abilities to pursue science as a profession. Undergraduates are obviously less likely to apply for graduate or medical school if they do not perceive themselves to be capable of doing the work, including the crucial but often intimidating or difficult skill of writing like a scientist. Table 2 shows the percentage increase or decrease for each possible answer to the self-ranking questions.

Portfolio Reviews

When students were asked to name their most favorite and least favorite writing assignments in the class, the two most commonly mentioned assignments favorite and least favorite were the research proposal (described above) and the review article, respectively. For the review article, students read and discussed a published review article then were asked to write their own on a prescribed topic. Ironically, the review article was the second most favorite assignment behind the research proposal, but it was also the overall least favorite assignment. The research proposal was the most highly favored assignment by far. The most common reason given for favoring the research proposal was that students enjoyed choosing their own topics. One student

commented that “the assignment mattered to me.” Some mentioned that they enjoyed the process itself. The most common reason given for not enjoying the review article was that the topic was not familiar or not interesting.

CASE 2: GENDER STUDIES

The librarian’s involvement in the course began with a visit to the class to discuss primary sources and their importance in illuminating course readings and related concepts. In the context of this course, the concepts included capitalism, consumerism, production, socialism, class, and hierarchies. Students were encouraged to think about their research, to ask questions, to expect things to be confusing and unclear. The librarian was integrated into the course management system to encourage students to ask questions and came to class several

times throughout the semester. Beyond discussions and demonstrations of library resources and the research process, students were also taught to use the social bookmarking site *delicious* as a way of understanding the structure of information and classification systems (Donovan, 2009). Over the course of the semester, the librarian and professor worked together toward the following learning outcomes and information literacy standards (see Table 3).

In addition to a research assignment involving primary sources, G300 students engaged with secondary scholarly resources in preparation for partnering with classmates to lead class discussion on one day during the semester. In groups of four and five, students selected an article related to the course readings for one unit in direct consultation with the librarian. Communicating with a librarian throughout

TABLE 2 — SELF-RANKING QUESTIONS		
Self-Ranking Question	Possible Answers	Change between Pre- and Post Test
How would you rank your ability to find relevant journal articles?	excellent	10.5%
	good	36.8%
	average	0.0%
	poor	-36.8%
How would you rank your ability to read and understand scientific journal articles?	excellent	10.5%
	good	31.6%
	average	-31.6%
	poor	-5.3%
How would you rank your ability to express scientific ideas and questions in writing?	excellent	10.5%
	good	52.6%
	average	-42.1%
	poor	-15.8%
How would you rank your ability to formulate a topic or question for scientific research?	excellent	0.0%
	good	36.8%
	average	-10.5%
	poor	-21.1%

the selection process ensured that the chosen article was scholarly and content-rich enough to spark discussion and debate. Students posted the article in the Course Management System at least 3 days before the due date so that every student could read the chosen article prior to class and answer three discussion questions about it through an online forum. This was an effective way to prepare students for the class discussion and give the discussion leaders a prompt for the kinds of questions to use/ask during class. In class, discussion leaders summarized the article for their classmates and engaged their classmates in a discussion of the article's core argument. Each leader turned in a one-page explanation of authority and credibility for the article in order to demonstrate his or her learning of the evaluative criteria involved in scholarly

source selection, including author/source credibility, date of publication, etc.

The culminating research assignment resulted in the creation of an online index of student-selected articles to be used as research resources for the largest essay assignment. Each student was required to find and post online one (unique) scholarly article relating to an assigned course reading chosen in consultation with the librarian. In class, students reflected on the research process and collectively constructed a keyword index for the class source collection. Students wrote a one page justification for their selection in terms of relevance, authorship, and perspective, which served as a qualitative assessment tool to measure student learning.

TABLE 3 — LEARNING OUTCOMES AND INFORMATION LITERACY STANDARDS

Course Learning Outcomes		ACRL Information Literacy Standards
Students identify arguments in texts	↔	Standard One: The information literate student defines and articulates the need for information.
Students understand where/how to search for scholarly information within the field of gender studies	↔	Standard Two: The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.
Students seek out scholarly texts to answer questions	↔	Standard Three: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
Students seek out scholarly texts to raise new arguments	↔	Standard Three: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Pre- and Post-Test Survey

A survey was administered at the beginning and end of the course to measure basic information literacy skills as well as self-perceptions about writing and disciplinary thinking. The survey was optional and anonymous; responses were gathered by order turned in to obtain an even number of pre- and post-test responses.

Reflection Papers

Students were assigned a one-page reflection paper explaining where and how they found an article to use for an in-class discussion. These papers were examined to determine to what degree students applied research strategies taught in class, for an increase of confidence or awareness of the research process, and for information evaluation strategies.

Student Interviews

Students were interviewed by a third party near the end of the semester and asked about their experiences with having a librarian integrated into the course, their research strategies, and comprehension questions about primary and secondary sources.

Professor/Librarian Interview

The professor and the librarian were interviewed together by a third party at the end of the semester to reflect on the collaboration. They were asked questions about their expectations and thoughts on the final results of the project.

*Results**Pre- and Post-Test Survey*

There were two questions on student demographics (year in the program, gender studies major or not), and four questions asking students to self-rate their confidence level on various facets of research that the librarian taught over the semester. Demographics did not change significantly,

but as indicated in Tables 4, 5, 6 and 7, student confidence increased in each surveyed area. Possible responses were assigned point values, and pre- and post-test averages are presented as well as the number of individual responses.

Reflection Papers

While research strategies and confidence change were unclear from the reflection papers, evaluation strategies were clearer. Out of the 16 students in the class who submitted a one-page reflection paper justifying the selection of their article, all but 4 identified elements of authorship, perspective, and relevance to the course readings.

Student Interviews

Students mentioned that they found the discussion leader component of the course (during which students in small groups chose articles for the class to read and discuss) to be both “enjoyable” and “beneficial.” Working with the librarian, they said, made research “easier,” and they also specifically mentioned new knowledge of key databases within gender studies and “lot better strategies to find the right information.” Students were able to define primary and secondary sources as “pure” and “essential,” and said that they had a new appreciation for library resources and their authority: “We have subscriptions to everything!”

Professor/Librarian Interview

Responses indicated that this kind of collaboration offers opportunities to improve student learning and to resolve “problematic” issues with the course. As the professor said, “[This collaboration] definitely improved the course all around and the particular assignments and most of the readings.” The librarian commented that this project allowed the two collaborators to

TABLE 4 — PRE- AND POST-TEST RESPONSES				
Overall, how confident do you feel about your ability to do research for G300?	Pre-Test Response	Post-Test Response	Pre-Test Average	Post-Test Average
Not Confident (1pt)	0	0	2.63	2.73
Somewhat Confident (2pts)	7	3		
Confident (3pts)	4	9		

TABLE 5 — PRE- AND POST-TEST RESPONSES				
How confident do you feel about your ability to find primary sources?	Pre-Test Response	Post-Test Response	Pre-Test Average	Post-Test Average
Not Confident (1pt)	0	0	2.27	2.90
Somewhat Confident (2pts)	8	1		
Confident (3pts)	3	10		

TABLE 6 — PRE- AND POST-TEST RESPONSES				
How confident do you feel about your ability to find scholarly secondary sources?	Pre-Test Response	Post-Test Response	Pre-Test Average	Post-Test Average
Not Confident (1pt)	2	0	2.36	2.63
Somewhat Confident (2pts)	5	4		
Confident (3pts)	4	7		

TABLE 7 — PRE- AND POST-TEST RESPONSES				
How confident do you feel about evaluating the quality of information sources?	Pre-Test Response	Post-Test Response	Pre-Test Average	Post-Test Average
Not Confident (1pt)	1	0	2.18	2.63
Somewhat Confident (2pts)	7	4		
Confident (3pts)	3	7		

“realize too that we have the same goals, really, for the students. It’s really to get them thinking more about what they’re reading in class by bringing in different perspectives, and then also there’s the benefit that they get these information-seeking skills kind of without really realizing that that’s a focus of the course.” In other words, this type of project enhances both relationships with faculty and student learning.

CONCLUSIONS

In both cases, the collaboration resulted in the enrichment and improvement of the teaching and learning process. For students, critical evaluation of information and an understanding of the nature and structure of information and its relevance to disciplinary thinking improved their research output and their overall experience of the courses. The importance of self-ranking and confidence, while sometimes criticized as an accurate measure of success, should not be taken lightly for undergraduates, especially if the goal of the institution is to produce scholars with the confidence and ability to assert their ideas and visions. For the instructors and librarians, the ability to collaborate and combine pedagogical approaches exposed new practices that will affect teaching styles whether the librarian is present in the future and will inform the librarians’ strategies for information literacy integration in all future cases of collaboration.

The fact that both librarians started from the same set of standards and principles in this study is key. Both librarians approached the consultation and design process with the ACRL standards in mind. Also imperative was the understanding that only through a clear exchange and communion of learning goals would either course be successful. To the benefit of the librarians, both instructors

were receptive to new approaches to improving their courses. Despite volumes of literature and general buzz within the library culture about change, specifically that involving technology, user attitudes, and the role of the librarian itself, the adherence to the ACRL standards as they are, along with good communication between librarians and instructors, is the most demonstrably effective way for librarians to remain effective in the academic teaching and learning realm.

As a result of the data gathered for this study, collaborative efforts in restructuring course assignments and implementing assessments specifically designed to measure information literacy knowledge are proven successful approaches to implementing information literacy across disciplines in a scalable way. While regularity in course offerings in gender studies and biology as well as instructor availability has proven to be difficult for consistency, the approach offers one model for information literacy education that could be implemented by librarians working with faculty in any discipline. For future assessments in the form of pre- and post-tests, questions regarding perceived levels of “confidence” will be replaced with more straightforward questions correlated with course goals, specifically the identification and understanding of audience, perspective, and authorship as represented in scholarly sources. While it was helpful to have qualitative data for the purposes of this study, using open-ended questions would have allowed further insights into students’ awareness of these topics. The reflective piece in which students were requested to describe their process for source selection and provide justification based on authorship, perspective, and audience was the assessment approach that was most illuminating. In addition, it coalesced with

the research assignment in an organic way that made sense to students as an authentic assessment, unlike the pre- and post-tests which were delivered as a stand-alone assessment.

At Indiana University, this study built on a body of evidence and best practices that offer new and innovative ways for librarians to participate in the teaching and learning mission of the university. For the library to support and be active in the new General Education Policy, it will be essential for librarians to have a body of work from which to draw guidance and successful models for the development and implementation of information literacy in other disciplines. To date, the evidence suggests that the most effective approach is a tiered model to information literacy education, whereby students meet specific information-related learning goals in unison with the learning goals of the discipline. While this study focused on specific levels of undergraduates in two different disciplines, it is important to develop and assess practices in other disciplines in order to reach the ultimate goal: a university-wide model for information literacy integration.

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APPENDIX A — G300 PRE- AND POST-TEST SURVEY QUESTIONS

In G300: Gender Studies Core Concepts & Key Debates, you are required to conduct research to prepare for leading class discussion and for the Secondary Scholarship exercise in preparation for your long essay. The following questions relate to your knowledge of research resources and strategies for G300.

Indicate your student status:

Freshman, Sophomore, Junior, Senior, other

Are you a gender studies major?

Yes, No, undecided

Overall, how confident do you feel about your ability to do research for G300?

Not confident, Somewhat confident, Confident

How confident do you feel about your ability to find primary sources?

Not confident, Somewhat confident, Confident

How confident do you feel about your ability to find scholarly secondary sources?

Not confident, Somewhat confident, Confident

How confident do you feel using a search engine such as Google to search for resources on a specific topic?

Not confident, Somewhat confident, Confident

How confident do you feel using the IUB Libraries' web site to search for resources on a specific topic?

Not confident, Somewhat confident, Confident

How confident do you feel about evaluating the quality of information sources?

Not confident, Somewhat confident, Confident

When you do research, how important are the following tools/resources?

1 = not important 2 = somewhat important 3 = important

- IUCAT, the IUB Libraries' online catalog
- Library resources such as Academic Search (EBSCO) or Gender Studies Database
- Search engines such as Google
- Librarian
- Course instructor
- Classmates

When you do research, how important are the following criteria for selecting information sources?

1 = not important 2 = somewhat important 3 = important

- Overall relevance to research topic
- Relation to course readings
- Credibility of the author
- Contradicts what you already know
- Corresponds with what you already know