Faculty Perspectives on Information Literacy as a Student Learning Outcome

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Information literacy is a popular and widely-written about topic in the literature of library information science, and is widely identified as an essential competency for college students. Nevertheless, recent research indicates that students largely lack the competencies associated with information literacy and that many colleges and universities are not moving beyond one-shot, course-level library instruction sessions to integrate information literacy into their curricula at the program and institutional levels. One reason for this lack of progress may be that discipline faculty—those who have the most direct contact with students, as well as the most direct oversight of and responsibility for the curriculum—have been largely missing from the conversation. This study aims to fill this gap by surveying and interviewing a nationwide sample of teaching faculty in six disciplines for their perspectives on the importance and relevance of information literacy competencies for their students. The results of this study provide academic librarians a broader insight into faculty understanding of information literacy and will help to advance the discourse of information literacy further into the disciplines.

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Information literacy is a popular and widely-written about topic in the literature of library information science (LIS). Librarians have been discussing information literacy for decades, promoting its importance with documents like the American Library Association's (ALA) *Final Report*,[1] and establishing definitions and frameworks such as the Association of College and Research Libraries' *Information Literacy Competency Standards for Higher Education*.[2] Academic librarians, in particular, point to information literacy as a way for college and university libraries to directly support the educational mission of their institutions, align with institutional goals, and regain some of their historical centrality on campus. While acceptance of information literacy in the broader field of higher education has been more recent, publications like the Lumina Foundation's *The Degree Qualifications Profile*,[3] and the American Association of College and Universities' (AACU) *Liberal Education and America's Promise* (LEAP),[4] as well as the standards and supporting documents of the six regional accreditation organizations demonstrate that these stakeholders recognize information literacy as an important learning outcome essential to a broad liberal education. In general, stakeholders within higher education seem to agree with librarians that the ability to find, access, evaluate, and use information in effective and ethical ways is necessary to a students' success within their educational program and afterward in their work and personal lives. Indeed, *The Degree Qualifications Profile*[5] describes the use of information resources as one of five broad competency areas that transcend disciplinary boundaries and enhance learning across different fields and programs. Nevertheless, recent research indicates that students largely lack the competencies associated with information literacy[6] and that many colleges and universities are not moving beyond one-shot, course--level library instruction sessions to integrate information literacy into their curricula at the program and institutional levels.[7]

One reason for this lack of progress may be that disciplinary faculty—those who have the most direct contact with students, as well as the most direct oversight of and responsibility for the curriculum—have been largely missing from the conversation. The vast majority of writing about information literacy comes from the LIS literature, and is written from the librarian's perspective. Even the development of the ACRL standards took place without the input of disciplinary faculty, and yet these are the standards teaching faculty are most often expected to address in their courses. Are disciplinary faculty aware of information literacy standards such as those offered by ACRL? Do they believe that the skills and competencies associated with information literacy are important for their students to learn? And, if so, whose responsibility do they believe it is to teach those competencies? Do faculty attitudes and perceptions vary across disciplines? This study aims to answer these

questions by surveying and interviewing a nationwide sample of teaching faculty in six disciplines for their perspectives on the importance and relevance of information literacy competencies for their students. The results of this study provide academic librarians a broader insight into faculty understanding of information literacy and will help to advance the discourse of information literacy further into the disciplines. Teaching faculty and others with responsibility for overseeing the curriculum will also be interested to see how instructors in these disciplines currently understand and address information literacy. Building on these insights, faculty and librarians might engage in conversations for further integration of information literacy into the curriculum.

Literature Review

Information literacy, commonly defined as the ability to find, access, evaluate and use information, has its roots in traditional library or bibliographic instruction. In recent years, however, stakeholders in higher education, including research and policy organizations, regional accreditation organizations, and the federal government, have recognized and endorsed information literacy as an essential student learning outcome. In supporting its integration throughout the curriculum, the Middle States Commission on Higher Education emphasizes that the skills and concepts associated with information literacy are relevant to all disciplines and should be addressed within the majors and programs as well as part of the general education curriculum. Such integration requires buy-in and support from the faculty who oversee the curriculum, which in turn assumes that faculty value these skills and competencies. Nevertheless, there have not been many systematic studies of faculty attitudes toward information literacy, leading McGuinness to state that "our knowledge of faculty attitudes towards, and perceptions of, information literacy development, have been shaped primarily by second-hand accounts of their behavior."[8] While there have been some studies of faculty perceptions of information literacy, most have been limited to faculty within a single disciplinary area and/or those teaching in a single institution or geographic region. Looking across these studies, however, there are some patterns as to instructors' attitudes toward information literacy and their assessment of students' competency in this area.

In general, most faculty rate information literacy competencies from all five ACRL standards, ranging from proper citation of sources to finding and evaluating scholarly literature, as important.[9] Indeed, Gullikson found that faculty rated 61 out of the 84 information literacy outcomes as highly important, with an average score of 3.25 out of 4, while very few outcomes were rated as not important.[10] When asked to rate their students' information literacy competencies against the ACRL standards, most journalism instructors stated that their students were moderately competent, but very few believe their students to be excellent. The number of journalism faculty stating that all of their students are information literate was never higher than 10%.[11] Similarly, faculty in both engineering and business indicate that information literacy competencies and instruction are important for their students. More than two-thirds of engineering professors believe that information literacy instruction is important for engineering students in all four years of undergraduate study, and note that student competencies in this area are not always satisfactory.[12] Business faculty members are particularly concerned with plagiarism, and indicate that they expect students to use library resources in their assignments.[13] While engineering faculty did not note a difference between students' ability to find, evaluate, and use information, other researchers suggest that students are adept at locating information, but often have trouble evaluating and synthesizing it into the type of literature review expected of academic papers.[14,15] These perceptions align with those of the ERIAL project, which found that with some training, students were well able to use library technology and tools, but continued to have difficulty with other information literacy competencies such as reading and understanding citations, implementing sophisticated search strategies, and evaluating information.[16]

While the instructors appear to value information literacy competencies, they do not necessarily agree on how students should be taught these abilities. For instance, instructors vary in the extent to which they address information literacy outcomes in their courses, the level at which they expect students to acquire information literacy abilities, and who should be responsible for teaching and assessing those competencies.[17] For instance, while a majority of journalism and business instructors include assignments requiring library research or schedule an information literacy session in each of their courses, just over half of architecture and art and design instructors engage in activities that support information literacy learning outcomes.[18–20]

While engineering professors indicate that their students' abilities improve by senior year, these faculty members "admit to having a poor understanding of how students learn to do library-based research."[21] Indeed, some instructors seem to expect that students will acquire the necessary competencies on their own, or through exposure to resources.[22,23] Further, many faculty members appear to be reluctant to collaborate or otherwise engage with librarians in instruction and assessment of information literacy, and predict that dependence on librarian assistance in teaching will continue to decrease.[24] For instance, although most journalism instructors indicated that students' information literacy competencies improved after library instruction, few instructors integrated such instruction into their courses. Likewise, nursing instructors are more likely to view librarians as collaborators in curriculum development or assessment than as partners in instruction.[25]

One obstacle to faculty and librarian and further integration of information literacy into the curriculum may be confusion over the term *information literacy* itself. Even since the development of the ACRL standards, librarians have spent much time discussing and refining definitions for information literacy. In some cases, these debates might confuse rather than clarify the meaning.[26] Gullikson notes that faculty respondents returned her information literacy survey with notes indicating the term is vague and confusing, and generally lamenting the choice of language.[27] Moreover, information literacy is often over-identified with library skills. As a result, teaching faculty might believe competencies and abilities associated with information literacy are not their purview, a feeling occasionally reinforced by librarians who want to retain ownership of information literacy.[28,29] Such attitudes encourage faculty to focus on discipline content and assume that information literacy will be addressed in other ways.[30] In order to bridge the gap, librarians must understand the various cultures in which teaching faculty work, and reach out to them on their terms.[31,32] This study, by offering insight into perceptions of and attitudes toward information literacy of six different faculty groups, will help librarians toward such understanding and outreach.

Research Procedures

The purpose of this study is to explore faculty perspectives on information literacy, and to investigate possible cultural differences in their attitudes toward and approaches to information literacy within their disciplines. Specifically, the study aims to examine the following questions:

- How do faculty members define or understand information literacy?
  - Are they familiar with existing standards such as ACRL?
  - Does the development of a local definition of information literacy impact faculty understanding?
- How important do instructors believe information literacy to be for their students? How do they address information literacy, or expect it to be addressed within the curriculum?
- Are there disciplinary differences in faculty attitudes toward and approaches to information literacy?

Comparing cultural differences to information literacy across different disciplines is an important part of this study, and required the selection of a set of discipline or major areas on which to base the inquiry. Because the ACRL standards are the most widely known and used set of information literacy standards in American higher education, it made sense to use these as the basic framework for the study. Further, at the time the subject recruitment began, in the spring of 2011, ACRL task forces had developed five sets of discipline specific information literacy standards: Anthropology (2008), Science and Technology (2006), English Literature (2007), Psychology (2010), and Political Science (2008). Thus it was determined to choose a random sample of faculty in these disciplines from colleges and universities across the country for potential participation in the study. Because science and technology is such a broad area, and really incorporates two separate disciplines, it was decided to survey faculty in a natural science, namely biology, as well as in computer science. With the assistance of a graduate student, the researcher collected a random sample of 50 colleges and universities with undergraduate majors for each of the six programs. The institutions included in the study came from across the country, with representation from each of the six regional accreditation areas, and all of the Carnegie classifications. The graduate student then visited the web sites of each of the institutions and gathered the contact information for three faculty members from each. In departments with fewer than three faculty members, contact information was gathered for all instructors in the department.

Once a list of faculty from each of the selected schools had been compiled, and with the approval of the researcher's Institutional Review Board, an email was sent to each faculty member inviting them to participate in a brief survey (See Appendix 1). The body of the email outlined the project, assured participants of privacy and confidentiality, and then offered a link which directed them to the web-based survey. A reminder email was sent out about two weeks after the initial contact. Faculty members were asked a series of close-ended questions regarding their familiarity with information literacy standards, their perceived importance of information literacy for their students, and their estimation of their students' overall skills in several information literacy competency areas. The last two questions were open-ended. The first simply asked for any additional comments. The second asked the respondent to provide contact information if they would be willing to participate in a follow-up interview. The survey took about 5 to 10 min to complete. The survey was made intentionally brief, both because its purpose was exploratory with the intention to establish a baseline of faculty perspectives on information literacy, and in the hope that a short survey would encourage a higher response rate.

Based on survey responses, the researcher arranged interviews with those respondents indicating a willingness to participate. Because the interviewees live all across the country, interviews were conducted by phone. The interviews were semi-structured; a basic list of questions was asked of all participants, but there were some variations or additional questions which came up in the course of some of the interviews (See Appendix 2). Again, all participants were assured of the privacy and confidentiality of their responses. The researcher took notes during all interviews, and then analyzed the content of the interviews to look for patterns or themes in responses. The coding for the interviews was emergent; that is, interview transcripts were read numerous times, note was taken when similar words, phrases, or ideas were expressed, and then these instances were gathered into categories or codes to represent the major themes in participant responses.

Quantitative Findings

Response rate is always a concern with surveys, as low rates can skew results and limit the ability to generalize from those results. This survey has two separate response rates—the first is the overall response from the total number of surveys sent out, and the second is the set of individual response rates from the total number of surveys sent to each discipline area. Figure 1 lays out the total and disciplinary response rates. At 33.3%, the overall response rate for this survey is relatively high. Nevertheless, it is important to consider that there might be significant differences between responders and non--responders, and therefore be careful in extending the results to the greater population. Still, the findings offer some interesting insights into faculty perceptions of information literacy, and can still be instructive for librarians and others hoping to work with faculty on integrating information literacy into their courses and curricula.

On the surface, the response rates suggest some disciplinary difference in participation. As the table demonstrates, the response rates across the disciplines were fairly consistent with each other and with the total, with the exception of technology, which was substantially lower than the other disciplines. A chi-square test on the response rates results in a p of .0001, showing a very strong correlation between a faculty member's discipline and whether or not they responded to the survey. That said, 18 participants chose the 'other' category and indicated computer science as their area in the open-ended response. If those 18 are added to the 14 respondents who chose technology, it raises the response rate for this category to 24.8%, and cancels the correlation. From this perspective, then, there is no difference in response rate across disciplines.

Similarly, the basic questions regarding the importance of information literacy competencies, and students' abilities in those competency areas, revealed no difference among disciplines. Faculty members overwhelmingly believe that information literacy is important for their students. When asked to rate their agreement with the statement that information literacy is important, 71.8% or 196 participants strongly agree, and another 24.9% (68 participants) agree. Similarly, 77.6% of respondents (211 participants) strongly agreed or agree that they address information literacy concepts in their teaching. Substantially fewer faculty, 55.2% (148 participants) strongly agree or agree that they assess for information literacy outcomes.

When asked to rate their students' overall abilities in each of the seven competency areas, faculty were somewhat less positive. As

Figure 1
Response rates: total and by discipline.

Discpline Area	Total Survey Requests Sent	Number of Responses Received	Response Rate
Anthropology	137	40	29.2%
Biology	145	47	32.4%
English Literature	142	44	31.0%
Psychology	137	46	33.6%
Political Science	144	41	28.5%
Technology	129	14	10.9%
Other	n/a	46	n/a
Total	**834**	**278**	**33.3%**

illustrated in Figure 2, the majority of the faculty rated students as 'somewhat strong' in six areas, specifically: identifying scholarly materials, identifying reliable/authoritative information, finding relevant information, citing sources properly, synthesizing information, and searching databases. The only skill area in which students were rated 'strong' was searching the general web. On the other hand, very few participants rated their students as very poor or poor in any area. These results suggest that, while students could improve in most areas, they do demonstrate some ability with information literacy competencies.

Nevertheless, there were some disciplinary differences in questions regarding assessment of student abilities, and familiarity with standards for information literacy. There was a weak correlation between faculty discipline and assessment of students' ability to identify scholarly materials ($p = .054$), to search databases ($p = .054$), and cite sources properly ($p = .057$). There was a strong correlation between discipline and assessment of students' web search abilities, with the majority of Biology faculty rating students as very strong in this area, while English Literature and Anthropology faculty largely assessed students as 'somewhat strong.' There was no difference among the disciplines in assessment of students' abilities to find reliable information, find relevant materials, and synthesize information. Interestingly there were much stronger correlations between position title (Assistant Professor, Associate Professor, Professor, Lecturer) and assessment of student abilities, with assistant professors generally rating students somewhat lower than their counterparts.

Respondents were also asked to rate their level of agreement with the following statements:

- Instruction of information literacy is the responsibility of teaching faculty
- Instruction of information literacy is the responsibility of librarians
- Instruction of information literacy should be led by faculty with the collaboration and support of librarians.

The intention of this question was to determine if faculty members have an opinion as to who should be responsible for teaching information literacy concepts, but no clear answer emerged from this question. As Figure 3 demonstrates, high percentages of respondents agreed or strongly agreed with each of the three statements, with only a handful of respondents disagreeing on any count. Further, there was no correlation between faculty discipline and perceptions on teaching responsibilities for information literacy.

Conversely, a strong correlation was discovered between discipline and whether the faculty member had invited a librarian to their classroom often/several times or once/never ($p = <.0001$), although there was no difference across disciplines as to whether they believe the library instruction was effective.

Finally, faculty were asked whether they were familiar with any standards for information literacy, and if so which ones. Chi-square tests suggest a relationship between discipline and whether the faculty member was familiar with any existing definitions of information literacy ($p = .0082$). If participants indicated they were familiar with information literacy standards, they were asked to identify which ones. The responses were fairly equally distributed among the ACRL standards, regional accreditation standards, and locally developed definitions. While there was no difference among the disciplines with regard to whether faculty believe information literacy is important for their students, and whether they claim to address information literacy competencies in their courses, further chi-square tests demonstrated that familiarity with information literacy standards—regardless of which ones they were—was strongly correlated with whether the faculty member addresses information literacy competencies in their courses ($p = <.0001$) and whether they think information literacy is important for their students ($p = <.0001$). These findings suggest that knowledge of information literacy standards or definitions is more important than discipline with regard to faculty perspectives on information literacy.

Qualitative Findings

The second part of this study consisted of a series of 25 qualitative interviews with participants who volunteered at the end of the survey. All interviews were conducted by phone. As illustrated in Figure 4, the participation rate for interviews varied more widely than the response rate for surveys, with Biology and Anthropology faculty participating at much higher rates.

Interviewees were asked to define information literacy, and then answered open-ended questions regarding whether they address information literacy concepts in their courses, and where they see information literacy fitting into the overall curriculum. Content analysis of interview notes highlights some important trends in the way faculty think about information literacy both in general and

Figure 2
Rating student ability in information literacy competencies.

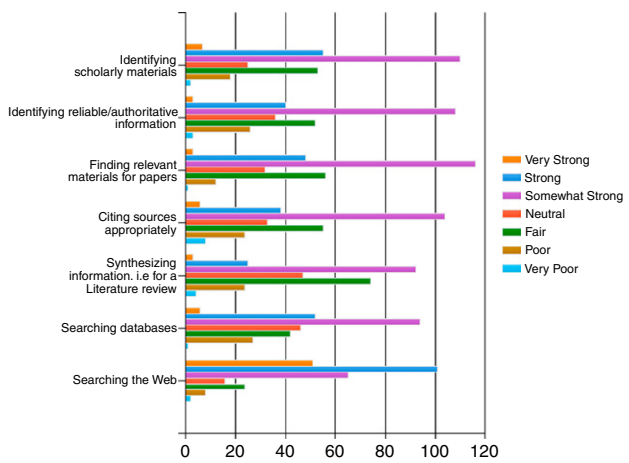

Figure 3
Responsibility for information literacy instruction.

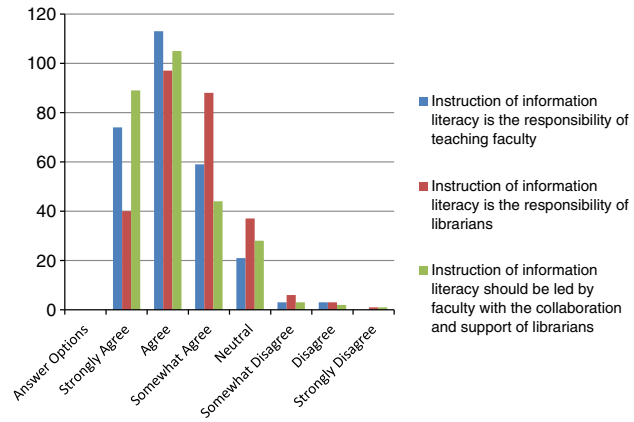

Figure 4
Number of interviewees by discipline.

Discipline Area	Anthropology	Biology	English Literature	Political Science	Psychology	Computer Science	Total
Number of Interviews	7	8	5	3	1	1	25

within their individual disciplines. Overall, this study confirms earlier findings that faculty believe the competencies associated with information literacy are important and students need to develop these competencies, but there is a lack of consensus about where information literacy belongs in the curriculum and who should be teaching it. Within the disciplines, interviewees did highlight some differences in terms of how information literacy is applied, although most interviewees also stressed that there are important similarities as well. Each of these theme areas is explored in more detail below.

Importance of Information Literacy

Participants unanimously and overwhelmingly agree that information literacy is important for their students, underscoring their feelings with words like "critical," "absolutely," and "essential." Further, some participants contend that information literacy is not only important for college students, but also for everyone. One faculty member noted that "we can't function without it," while another insisted "I can't think of anything you can do in the world today that you can do without this… no task that doesn't involve information. Every person in the world today at every level needs it." Responder bias could certainly account for some of the enthusiasm of the responses, as it is likely that faculty members who volunteered to be interviewed likely already support the idea of information literacy. Nevertheless, the participants did not all share an equally clear understanding of the concept. For instance, when asked to define information literacy in their own words, several respondents conflated information literacy with technology or computer literacy at first. Some also initially limited their definition to the use of library sources, or the basic skills of searching. In the end, however, all participants arrived at similar definitions, which generally included location, access, evaluation, and application of information.

In addition to some initial confusion over definitions, it is worth noting that some participants indicated they were not familiar with the term before this study, and some indicated discomfort with the term. For instance, several faculty members began their response by saying information literacy was not a term they used, but then went on to identify those competencies usually associated with it such as access and evaluation of information. One participant stated "I think the term information literacy gets in the way" because, to her, literacy implies only basic skills and understanding. Comments such as these support the idea that some discussions on information literacy might be forestalled due to misunderstandings or lack of knowledge about the term itself.

Regardless of their individual definitions and reactions to the terminology, faculty members agree that students generally need instruction and support to develop their information literacy skills. In fact, while quantitative assessments of student abilities were largely positive, with most faculty rating students as strong/very strong in each competency area, interviewees highlighted specific concerns and problem areas. In particular, several participants pointed to the problems students faced in dealing with information overload, which they variously referred to as a "glut," and an "avalanche." These participants note that students need help filtering through the information. They also suggested that, contrary to what is generally believed about the generation referred to as 'digital natives,' students are not particularly adept at searching for and finding information. One participant indicates that students perceive themselves to be better searchers than they actually are, while another contends that the idea of "digital natives is such a lie" and that "the art of thinking like a cataloger" has been lost. Many respondents lament students' over-reliance on familiar sources such as Google and Wikipedia. Ironically, one interviewee contends that students rarely seem to look for information despite its abundance and accessibility on the Web. In her words, "the more information is available, the less students seem to use it." As an example, she noted that when her students read an assigned story and did not recognize certain names of people or places (such as jazz musician Charlie Parker or Harlem), they did not bother to look up the subjects.

Another common concern is students' lack of discrimination selecting resources. While most students seem to understand that they must evaluate information they access on the open Web, according to interviewees some students fail to distinguish among other information sources such as newspaper articles, opinion pieces, and scholarly journals. These respondents lament students' reluctance to question what they read or are told. One participant stated that students "want to be told what to think," while another described students' tendency to trust information sources as a lack of "natural skepticism." In general, faculty members appear to believe that students need instruction and support in locating and identifying quality information. The prevalence of issues around accessing and evaluating information suggests that information literacy needs to be addressed sequentially and developmentally within the curriculum.

Information Literacy in the Curriculum

While interviewees strongly support the idea that students need to learn information literacy competencies, there was less consensus about when, how and by whom those skills should be addressed. When asked whose domain is information literacy, or who should be responsible for teaching it, respondents tended to be somewhat vague and general in their responses. Several respondents contend that information literacy should ideally be addressed at the high school or even junior high level. It was unclear, however, whether these respondents are suggesting that information literacy could be addressed at a higher level when students enter college, or whether they believe information literacy would not need to be addressed at all. Similarly, others suggested it belongs in general education and could be addressed through core composition or first year classes. Such responses suggest that students could become fully competent through these introductory courses, and faculty within the disciplines would not have to address it. Only one faculty member put the responsibility for teaching information literacy squarely on the shoulders of the librarians, stating that librarians are "good at it" and faculty members should simply "let them do their job."

Conversely, two or three respondents indicate that they consciously and systematically address information literacy, and they

offer some interesting examples. For instance, one biology professor indicated that her department completely restructured the introductory course, partly in response to a perceived need to address information literacy concepts. She says they "threw out half the content" of the course and spend more time now teaching students how to obtain, interpret, and use data. Similarly, one of the Political Science faculty members describes a truly integrated and developmental approach to information literacy in his department, what he calls "an intentional approach." In his example, as students progress from the 100 to the 400 level courses, they build their skills incrementally. For instance, in the 200 level courses, they are not assigned a research paper, but they do construct a bibliography and indicate how they would use the sources. At the 300 level they carry out their research and write a paper, for which they have to use library and archival resources. At the 400 level they focus on how to critique sources "in a professional manner," and write meaningful reviews. Each of the assignments for these courses is graded against a rubric, which includes attention to information literacy competencies such as whether students choose scholarly and relevant materials.

The majority of participants suggest that it is a shared responsibility to teach information literacy. These participants said things like information literacy should be taught to students "in lots of different places and in lots of different ways," and that there are "multiple homes for information literacy, starting in the classroom," but also involving the departments, the library, and IT. Similarly, one respondent states "everyone in the entire university should be responsible" for teaching information literacy. When asked how they incorporate information literacy concepts into their own courses, several respondents describe instances in which they invite librarians to their classes to do library instruction. They repeatedly used words like "excellent" and "expert" to describe the librarians, stating they were valuable but often underutilized resources. Indeed, one faculty member said she learns something new every time she has the librarians come to her class, and suggested that the librarians should offer more workshops for the faculty.

While such responses appear supportive of both information literacy and librarians, they highlight the fact that most teaching faculty still take an intermittent or ad-hoc approach to information literacy. For these participants, addressing information literacy tended to be dependent on whether the course required a research paper. Some interviewees explained that some of their classes were too large to assign research papers, and as a result they did not address information literacy in those courses. When they do assign research papers, these faculty members tend to set expectations about the quality and scholarliness of the resources to be included. The extent to which they explicitly instruct students in methods for finding and evaluating these sources varies, however. Some simply set the expectation, and assume students either know how to find such sources, or will ask for help. Others do incorporate instruction into classes either by teaching it themselves, or by inviting librarians in to demonstrate database searching. However, despite belief in the librarians' expertise, none of the respondents indicated that they collaborate with the librarians or look on them as potential partners in instruction. There was not a single example of faculty working with librarians to design assignments, co-teach classes, or develop learning outcomes. Rather, library instruction seems to be regarded as an add-on, and heavily dependent on whether the faculty member can give up class time.

One faculty member, an English Literature professor who also teaches introductory composition courses, likened the situation of information literacy to that of writing in the curriculum. As she noted "everyone thinks the English department should teach writing, but then they only have one semester to do it." As a result, she believes information literacy "gets foisted" on the librarians, and "they only get a 75 minute session." This perspective aligns with earlier research that finds a lack of responsibility or ownership of information literacy on many campuses.[33] As this interviewee sees it, many faculty members assume it is taught in introductory courses, and become frustrated when they have to address it themselves. Further, while she thinks librarians are wonderful, she contends that they are "not trained to teach." Her fear seems to be that librarians' lack of pedagogical training compounds the problem of having so little time in the classroom, and might make them less effective teachers. The literature of library and information science supports the claim that librarians often feel un- or underprepared to act as teachers.[34] However, one could also argue that few PhDs are taught to be teachers either, and that librarians have been making a concerted effort to get the training they need either through continuing education or other professional development opportunities. Either way, though, this perceived deficit is one that librarians will have to face and work to convince faculty that they can be effective and knowledgeable in this area.

Finally, the respondents to this study are not likely to assess specifically for information literacy. In general, they claim to consider the quality of the sources as part of the overall grade for the assignment, but the scores do not seem to be tied to rubrics, nor is it clear if they are made explicit to students in the feedback. In general, these responses appear to confirm that while faculty believe information literacy is important, for the most part they have not identified ways to integrate it into the curriculum in a systematic way, or to move beyond individual courses to the program level. These findings support results from a previous study on the state of information literacy in higher education.[35] Conversely, however, faculty discussions of how information literacy differs in the disciplines strongly suggest that a more systematic and developmental approach to teaching information literacy is required.

Information Literacy in and across Disciplines

One of the primary aims of this study was to explore whether the competencies of information literacy are understood and/or applied differently in different disciplines. To this end, participants were asked to define information literacy in their own words, and later were asked whether they think information literacy means something different in their field as opposed to others. Although there was variation among respondents as to the extent of disciplinary differences, the consensus seems to be that information literacy consists of both a baseline set of competencies that are transferable or cross-disciplinary, as well as some knowledge and skills that are specific to each field. A couple of respondents minimized the variance, claiming that there are more similarities than differences, but only one interviewee insists there are no disciplinary differences in information literacy.

The baseline competencies identified by participants center mostly on the location, access, and basic evaluation of information. As noted below, faculty are concerned with students' reliance on Google and Wikipedia for information, and contend that all students need to be aware of and have some understanding of other sources of information and how to search and access them. Similarly, there is consensus that all students should understand that information varies in quality and authority, and should be able to discriminate among different types of sources. As students get further into their fields, however, greater distinctions are made. Interestingly, some differences are finer than just the broad field or discipline. Some interviewees made distinctions between, for instance, practical/applied and theoretical biology, or humanistic/historical versus biological anthropology.

One of the biggest differences to emerge from these interviews is the types of sources on which each discipline relies, as well as how those sources are located and evaluated. While peer-review was important to all interviewees, faculty members in the sciences stressed the primacy of the peer-reviewed article. They also included original data as a source of information for students. On the other

hand, those in the social sciences and humanities are also interested in having students access and interpret newspaper articles, blog posts, and other sources that might be considered less scholarly. As one faculty member noted, sometimes she wants her students to look at opinion pieces, but they have to understand that it is opinion.

Many of the interviewees discussed the importance of distinguishing between primary and secondary literature, but even what is identified as primary or secondary varies from discipline to discipline. For literature professors, primary documents are the novels, stories, and poems created by authors, while for anthropologists and biologists, primary sources are original research reports. On the other hand, political science and historical anthropologists identified newspapers, letters, and diaries as primary documents. Anthropology professors also included maps, cultural artifacts, and genealogical resources.

As the sources vary, so does the evaluation and use of the sources. For instance, while determining the authority of an article might be similar across disciplines, faculty members noted that in the sciences, students also have to assess the quality of the research. In other words, they need to understand the research process and the collection and interpretation of data in order to determine if a particular research project and the conclusions drawn from it are valid. These faculty members suggest that evaluation in the humanities might be more about interpretation of meaning and aesthetic appreciation. Some of the interviewees drew comparisons to writing within the disciplines. They point out that how one builds an argument or presents data varies so that a lab report, for instance, is a very different document from a critical interpretation of a novel, and that students often take time to comprehend the differences.

Finally, the location and access of information seems to vary slightly from one discipline to another. Most of the interviewees stressed the importance of moving beyond Google to find scholarly and peer-reviewed articles. For many, this meant students had to learn to use the library databases, although some also pointed to Google Scholar or open access sources such as PubMed and the National Library of Medicine as good sources of information. One political science professor noted the importance of chaining, or following citations to locate an original source, while an anthropology professor included familiarity with specific genealogical software packages such as Family Tree Maker and Kinship as necessary. One interviewee who teaches in the area of history and political science describes how researchers in his field need to be able to 'imagine' documents and information before they can try to search for them. For example, he suggested that if someone wanted to study fear as an underlying cause of the American Revolution, they first would have to imagine "where fear would be expressed in a document that would be readily discernible today—would it be pamphlet, a broadside, letters, newspaper articles?" They would then have to consider "Who would write about/care about/publish these? Where would I find them?" The process he describes seems to bridge more traditional search strategies with what Torres and Yakel describes as archival intelligence.[36] Whatever their focus, however, all faculty members indicate that an ability to find and use sources outside of course textbooks and assigned readings is an essential ability, implying the importance of learning outcomes for information literacy across disciplines.

Conclusions

The results of this study have some implications for librarians when working with disciplinary faculty. To begin with, the findings indicate that there continues to be opportunities for librarians to become involved with information literacy, but likewise the onus is still on the librarians to initiate and sustain discussions with faculty. The fact that interviewees strongly believe information literacy is important, but still have not found systematic ways to integrate it into their curriculum, suggests they might be open to suggestions and ideas from librarians in this area. Perhaps the most important finding of this study is that knowledge of and familiarity with information literacy standards is more closely associated with whether faculty address information literacy in their courses than any other variable including disciplinary area. Instructors who are familiar with standards or definitions of information literacy of any type are much more likely to incorporate information literacy concepts into their teaching, and to assess for information literacy competencies. As such, it is incumbent on librarians to initiate and continue conversations about information literacy with faculty.

As Smith pointed out over ten years ago, the onus is still on the librarians to bring ideas and approaches for information literacy to faculty.[37] The current study suggests that faculty might be receptive to approaches by librarians, under the right circumstances. Librarians often perceive faculty to be reticent in working with them, and librarians generally believe that faculty do not see them as peers. Indeed, this study demonstrates that faculty members are not collaborating with librarians, and, in at least one case, the faculty member is doubtful of librarians' preparation to be teachers. On the other hand, however, the findings also suggest that faculty have a lot of respect for librarians and their expertise. What is more, the faculty seem open on the whole to being approached by librarians. One interviewee mentioned that the new anthropology librarian had an open house in the department when she was first hired. Unfortunately, this faculty member was unable to attend and now, a year later, she still has not met the librarian in person. She said that even though she gets occasional emails, she wished the librarian would just knock on her door and say hello, maintaining that face-to-face contact is still very useful. Another interviewee indicated that faculty would like to be consulted when librarians are making policy decisions or planning events. Several interviewees emphasized how much they appreciate libraries and librarians, noting that as students and researchers they have often spent a lot of time in libraries using the resources. As such, the seeming unwillingness of faculty to partner with librarians may have less to do with a lack of respect for the position, and more to do with a lack of understanding of how librarians can contribute to and support their instruction. To take advantage of faculty receptiveness, however, librarians have to be what one interviewee described as "aggressive in a good way." In other words, they must be persistent, vocal, and confident in their ability to contribute to learning outcomes.

Further, several of the faculty members interviewed seemed cognizant of and sympathetic to the challenges that librarians face. For example, some interviewees acknowledged that students seem reluctant to go to the library or to use resources that they cannot access full-text online. One interviewee noted that students seem to be intimidated by librarians, although he did not understand why they would be. These participants recognize the reality that libraries have to market their services. Further, some of the respondents also realize the role they can play in promoting the library. Specifically, they noted the need to "create assignments that require that skill set and grade in part on that." One interviewee lauded the library for developing workshops and tutorials, but admitted that "if they're not mandated the students won't go." Finally, several interviewees highlighted the importance of having the faculty member recommend the library to the students, and specifically send them there for assistance. These responses suggest that faculty understand that they strongly influence how students view and ultimately use the library.

Finally, this study highlighted a number of common areas of concern as well as some disciplinary differences among faculty with regard to information literacy. Across the disciplines, interviewees were concerned with students' lack of discrimination and evaluation of sources. However, previous research suggests that librarians tend

to focus on location and access of information during instruction sessions.[38] Similarly, at least one interviewee noted that librarians are not spending much time on evaluation of sources, and suggests that the library "might have a role of promoting and practicing skepticism" of information and information sources.

One of the biggest differences among the disciplines appears to center on sources: which are preferred, how they are found, and how they are evaluated. Indeed some of the critiques regarding librarians and library instruction also focused on the sources the librarians demonstrated or recommended to students. For instance, one faculty member complained that she had sent students to the library specifically to retrieve books, but several had come back with articles instead and as a result she was unable to carry out the activity she had planned. Another was upset to find that a librarian had recommended an encyclopedia as a good source of information to one of her students, when she wanted that student to look at research. While these are isolated incidents, they point to the fact that librarians might not always be aware of which sources of information are preferred in different disciplines. If librarians are focusing exclusively on subscription databases during instruction sessions, they may be overlooking some of the other information sources, including primary documents, that faculty want students to use. Once again, this finding points to the need for librarians to maintain dialogues with faculty to keep themselves informed of the needs and requirements of different courses and programs. On the whole, the findings of this study suggest that faculty and librarians both value the competencies with information literacy, but further discussion is necessary to develop a more systematic integration of these competencies into the curriculum.

Appendix 1

1. What is your position?

   Assistant Professor
   Associate Professor
   Professor
   Professor of Practice/Clinical Professor
   Lecturer
   Other (please specify)

2. Which best describes your subject field/area of specialty?

   Biology
   Anthropology
   English Literature
   Psychology
   Political Science
   Technology
   Other (please specify)

3. How long have you been teaching at the undergraduate level?

   Fewer than 5 years
   5–10 years
   11–15 years
   16–20 years
   20 + years

4. What is your institution's Carnegie classification?

   Bachelor
   Master's Smaller
   Master's Medium
   Master's Larger
   Doctoral
   Research

5. In which accreditation region is your institution located?

   New England Association of Schools and Colleges (NEASC)
   Middle States Commission on Higher Education (MSCHE)
   North West Commission on Colleges and Universities (NWCCU)
   North Central Association of Colleges and Schools Higher Learning Commission (NCACS-HLC)
   Western Association of Schools and Colleges (WASC)
   Southern Association of Colleges and Schools (SACS)

6. Are you familiar with any information literacy standards or definitions?

   Yes
   No
   Not sure

7. If yes, which ones?

Association of College and Research Libraries (ACRL)
Big 6
Regional accreditation standards
Locally-developed definition

8. One standard definition of information literacy is "the ability to locate, access, evaluate, and use information effectively and within legal and ethical guidelines." Based on this definition, please answer the following questions:

Please rate your level of agreement with the following statements:

	Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
Information literacy is an important concept for college students to master							
I address information literacy concepts (such as how to conduct literature reviews, cite sources, synthesize information, etc.) in my courses							
Instruction in information literacy is the responsibility of teaching faculty							
Instruction in information literacy is the responsibility of librarians							
Instruction in information literacy should be led by faculty with the collaboration and support of librarians							
I assess students on information literacy abilities							

9. Have you ever had a librarian present in your class?

Never
Once
Several times
Often

10. How effective would you say the library presentations are, in general?

Very effective
Effective
Somewhat effective
Neutral
Somewhat ineffective
Ineffective
Very ineffective

11. Please rate your students' abilities in the following areas:

	Very strong	Strong	Somewhat strong	Neutral	Fair	Poor	Very poor
Identifying scholarly materials							
Identifying authoritative/reliable information							
Finding relevant materials for papers							
Citing sources appropriately							
Synthesizing information, i.e. for a literature review							
Searching databases							
Searching the Web							

12. Are you aware of any programs, discussions, or initiatives for information literacy taking place on your campus?

Yes
No

13. If yes, who originates these discussions, initiatives, or programs? Check all that apply:

    Librarians
    Faculty
    Administrators
    Technology
    Center for Teaching Excellence
    Don't know
    Other (please specify)

14. Is there anything else that you would like to add?

Appendix 2. Interview questions

1. How would you define information literacy?
2. Would you say information literacy is important for your students?
3. Do you address information literacy competencies in your courses?
4. Do you assess for information literacy specifically?
5. Based on our discussion and your knowledge/understanding of information literacy, would you say that information literacy is different in your discipline compared to others? Is it context-dependent?
6. Is there anything else you would like to add?

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