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THE LIBRARY AND UNDERGRADUATE RESEARCH IN THE LIBERAL ARTS: PRESENT CONTRIBUTIONS AND FUTURE OPPORTUNITIES

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Abstract

This study sought to describe library value as seen through its various contributions to the mentored undergraduate research experiences of students in the arts, humanities, and social sciences at Hope College. Concurrently, it explored new opportunities for how librarians might become more directly connected with students involved in this hallmark of the academic program. Findings were intended to both highlight existing library contributions and initiate a well-informed movement toward aligning library priorities and with the greater institutional academic mission.

KEYWORDS: Academic libraries, arts and humanities, assessment, liberal arts, social sciences, undergraduate research

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Introduction

Within higher education's pervading culture of assessment, academic libraries, like other departments on campus, face increasing pressure to demonstrate how their contributions foster greater institutional goals and missions. Traditional library assessment data are no longer sufficient in that they do nothing to tell how the library actually impacts the work and experiences of students or faculty (MacAyeal 2014). Recognizing this, the Association of College and Research Libraries' (ACRL) *Plan for Excellence* placed atop its five-year goals and objectives a call for libraries to "demonstrate alignment with and impact on institutional outcomes" (Association of College and Research Libraries 2013 Association of College and Research Libraries. 2013). The *Value of Academic Libraries* report expounds on this in greater detail in an effort to both challenge and empower librarians to become proactively involved in campus initiatives concerning impact and accountability (Oakleaf 2010). In more specific terms, Matthews (2007) explains that "libraries must do a better job articulating the value of the library and its resources to research productivity" (109).

Motivated by such charges, the current study at Hope College sought to gauge and describe value as seen through the library's various contributions to the experiences of students engaged in one of the most essential aspects of Hope's educational mission—undergraduate research. Concurrently, opportunities for future, more intentional, library support for this key aspect of the curriculum were explored. Specifically considered for this study were students involved in Hope's burgeoning undergraduate research initiatives within the arts, humanities, and social sciences disciplines.

What is undergraduate research?

Defining characteristics

Undergraduate research has been called a “high-impact educational practice” (Kuh and Geary Schneider 2008), “the epitome of engaged learning” (Lopatto 2006), and “the pedagogy for the twenty-first century” (Dotterer 2002). However, while such accolades have provided a great deal of endorsement and support for undergraduate research, what are the characteristics that actually *define* it? Considering the range of programmatic and curricular models among institutions, as well as inherent differences between academic disciplines, constructing a universal definition can be difficult. Beckman and Hensel (2009) concur, as they conclude that there is no “correct” definition—“one size does not fit all” (44). In light of how widespread undergraduate research has become, such an assertion is indeed true; however, there are several important characteristics that echo throughout.

Hakim (1998) suggests that undergraduate research—“in the laboratory, in the studio, in the classroom, or in the library”—may be defined by four distinguishing attributes: mentorship, originality, acceptability, and dissemination (190). The first of these is perhaps the keystone of the greater framework in which undergraduate research is cultivated—that is, students working under the direct guidance of, or in collaboration with, a faculty mentor. Faculty proponents of undergraduate research, therefore, reject the long-held notion that teaching and scholarship are at separate “poles” of their “professional dichotomy”—in contrast, they embrace a pedagogy wherein these two elements “become parts of one simultaneous, overlapping, shared process” (Dotterer 2002). As Lee (2011) explains, students engaged in undergraduate research “take ownership in their own learning alongside a professor, and

together contribute new knowledge to the discipline” (n.p.). This “new knowledge” points to the originality of the work being done. It is this quality that is emphasized in the concise definition provided by the Council on Undergraduate Research (CUR), where it is called “an original investigation or inquiry . . . that makes an original intellectual or creative contribution to the discipline” (Council on Undergraduate Research (CUR) n.d.a). Hakim's third characteristic, “acceptability,” refers to how undergraduate research must be guided by the accepted conventions and practices of the field in which it is being done. The faculty mentor, therefore, “initiates the student into the methods of a discipline” (Kinkead 2003). With research methods, procedures, and milieus varying greatly among disciplines, it is here where the aforementioned “one size does not fit all” is especially fitting.

To make the experience all the more authentic and rewarding, undergraduate research culminates by providing students with, or helping them to identify, opportunities for dissemination. Many schools put on an annual undergraduate research conference where students are able to share their work (Abrams 2009; Potter et al. 2010). To reach a wider audience, students are often encouraged to submit proposals to national or local undergraduate research conferences or even to discipline-specific academic conferences (Helm & Bailey 2013; Spellman 2012). Further, some undergraduates may even see their work published. Whether locally in-house (Mariani et al. 2013), or through traditional scholarly journals (often coauthored by student and mentor), dissemination of undergraduate research via publication has become an increasingly viable option.

Recent history and implementations

The proliferation of undergraduate research in recent years is often accredited to the 1998 Boyer Commission report—a “blueprint” that put forth ten ways to “reinvent” undergraduate education at America's research universities; the first of these was a call to “Make Research-Based Learning the Standard” (Boyer Commission 1998). The report outlined suggestions for how this might be implemented, with the overarching goal to infuse the undergraduate curriculum with collaborative, inquiry-driven learning opportunities. Despite Boyer's emphasis on research universities, liberal arts colleges have heeded the call too (Cooley, García, & Hughes 2008; Mervis, 2001; Spellman 2012). In one study, undergraduate research programs at selective liberal arts colleges were found, on average, to outperform research universities in a number of measures (Hu, Kuh, and Gayles 2007). Regardless of institution type, undergraduate research has historically been, and still is, most prevalent within the “hard” sciences. However, through steady, successful expansion into other disciplines, mentored research opportunities are now more readily available to undergraduates whose academic interests lie in a more diverse range of subjects (Bettison-Varga 2006; Brown and Hargis 2008; Gabbert 2010; Moore, Avant, and Austin 2008; Rodrick and Dickmeyer 2002; Schantz 2008; McNary-Zak and Peters 2011; Stephens, Jones, and Barrow 2011; Stephens and Thumma 2005; Wilson 2003).

Arguably, the quintessential environment for undergraduate research is set within highly concentrated summer immersion programs. Because of obvious logistical barriers standing in the way of admitting all students into such programs, comparable undergraduate research experiences are also embedded into regular semester courses such as honors

(Stanford and Shattell 2010; Grobman 2011; McKinney and Busher 2011), and senior seminars (Allyn 2013). Although inherently less intimate and intensive than summer programs, it is possible for such courses to similarly employ facets of collaborative, inquiry-based learning when students “conduct research in which the outcome is not known (even to the course instructor) and have at least some input into the research topic and design of the methodological approach” (Lopatto 2010). Allyn (2013), for example, explains how, for nearly a decade, undergraduate research has been successfully integrated into a Health and Human Performance senior seminar. Over the course of the semester, students proceed through the various stages of conducting a small-group, original research project and are required to share the results via campuswide presentation. In the process, students are exposed to discipline-appropriate research fundamentals such as institutional review, treatment of human subjects, statistical analysis, and peer review.

Outcomes and student benefits of undergraduate research

The CUR lists the following as benefits of undergraduate research:

- Enhances student learning through mentoring relationships with faculty;
- Increases retention;
- Increases enrollment in graduate education and provides effective career preparation;
- Develops critical thinking, creativity, problem solving, and intellectual independence;
- Develops an understanding of research methodology;
- Promotes an innovation-oriented culture (CUR n.d.b).

Evidence supporting these and other claims can be readily found throughout the scholarly and professional literature (Fechheimer, Webber, and Kleiber 2011; Guterman 2007; Harsh, Maltese, and Tai 2011; Hunter, Laursen, and Seymour 2007; Kinkel and Henke 2006; Lopatto 2004, 2007, 2009, 2010; Russell, Hancock, and McCullough 2007; Seymour et al. 2004). Lopatto,

one of the more prolific and vocal advocates of undergraduate research, has been involved in several large-scale studies aimed at assessing its impacts on student learning (Lopatto 2009). Reporting on one such study, a multiyear assessment of summer research programs at four liberal arts colleges, he explained how benefits such as learning a topic in depth, developing a relationship with their mentor, understanding the research process, and readiness for more demanding research were all rated very highly by participating students. Gains in specific skills—hypothesis formation, data collection/interpretation, information literacy, computer work, and communication—were also reported (Lopatto 2006).

Recognizing the disparity of assessment data between the sciences and other subject areas, Ishiyama (2002) looked specifically to uncover the benefits of undergraduate research in the social sciences and humanities. Results indicated a positive correlation between early (freshman and sophomore year) undergraduate research participation and student gains in three specific areas of independent analytical development—namely, their ability to “think analytically and logically,” “put ideas together, and note similarities and differences between ideas,” and “learn on their own and to find information they need to complete a task” (385). Collaborative research with faculty was found to be especially beneficial to first-generation college students, a recognized at-risk population known to have more difficulty integrating academically.

Another cross-disciplinary study found that, across major, academic class, ethnicity, gender, and GPA, students involved in undergraduate research reported comparable benefits, including topic knowledge, résumé improvement, learning how to do research, and graduate

school preparation. The authors, one of whom was an undergraduate, also saw a positive correlation between undergraduate research participation and other outcomes, such as graduation rate and national awards won (Crane et al. 2011).

Other, more narrowly scoped, studies have found that undergraduate research positively affects student retention (Hippel et al. 1998) and the likelihood that students will matriculate on to graduate school (Hathaway, Nagda, and Gregerman 2002; Ishiyama and Breuning 2003). Potter et al. (2010), focusing specifically on the impact of a campuswide undergraduate research conference, found “presentation creation,” “public speaking,” “sharing ideas with colleagues,” and “confidence in taking initiative” to be among the benefits reported by students (29). Presenting at a professional conference has also been found to be a very positive experience for students (Helm and Bailey 2013). Further, numerous studies have revealed the benefits as seen by the other key participants in undergraduate research—the faculty mentors (Cooley, García, and Hughes 2008; Zydney et al. 2002; Kardash 2000; Wayment and Dickson 2008).

Academic libraries and undergraduate research

Recognized role

The CUR gives an affirming nod to libraries in its best practices protocol, *Characteristics of Excellence in Undergraduate Research* (Rowlett, Blockus, and Larson 2012). Section 3.3 acknowledges that “adequate library resources” (e.g., journals, monographs, books, disciplinary research tools/databases) and services (e.g., interlibrary loan, information literacy training) are critical to sustaining highly effective undergraduate research environments (7). Additional

materials such as archives and special collections, often housed in branches of the greater campus library system, are also included but listed separately under “Other research resources” (8).

In the academic library literature

The literature is replete with studies seeking to assess the role and effectiveness of library contributions to the generically defined “research” experiences of undergraduates, but those in which “undergraduate research” is singled out and *named*, as it has been here, have been slow to surface. Clearly chagrined by this fact, Stamatoplos (2009) asserts that the academic library literature has largely failed to acknowledge undergraduate research as a distinct student undertaking and movement within higher education. Rather than classifying the work and needs of undergraduate researchers uniquely, he notes that most of the available LIS literature presents these students “in traditional ways with traditional assumptions” (239). Stamatoplos’ article, which goes on to chronicle a successful collaboration between libraries and the various undergraduate research initiatives of his institution, is in many ways a call to action—first, by seeking to remedy the fact that undergraduate research has been deprived of its due distinction in the library literature, and second, by encouraging librarians to seek ways to align themselves and their services, when appropriate, with this increasingly common and integral aspect of baccalaureate education.

Today, Stamatoplos would be pleased to see that librarians have begun to fill the gaping void exposed by his article. Although far from inundated, the academic library literature and conference proceedings are now speckled with examples of librarians showing interest in

exploring their role in the explicitly stated “undergraduate research” programs at their institutions. Most recently, Hensley, Shreeves, and Davis-Kahl (2014) surveyed 758 college and university libraries of various sizes and classifications to determine if, and how, they are directly involved in supporting undergraduate research. Two hundred and forty-one of the 326 total respondents indicated that their institutions did have official undergraduate research programs, and of these, over two-thirds reported some level of library support being provided (e.g., collections, space, publishing, preservation, etc.). Prior to this, the same authors spoke at an ACRL conference on the topic of libraries targeting and supporting undergraduate research, specifically the dissemination stage, via institutional repositories and other platforms (Davis-Kahl, Hensley, and Shreeves 2011). Jones and Canuel (2013) presented at another ACRL conference on this same topic, emphasizing how during this final stage of undergraduate research librarians have the opportunity to contribute to students’ understanding of concepts such as scholarly communication, publication, and open access.

A cursory search of academic library websites or .edu domains in general will find that many libraries have been aligning themselves with undergraduate research by sponsoring awards for exceptional use of library collections. Bonnet et al. (2013) found value in reviewing the reflective, personal essays submitted by “apprentice researchers” applying for one such award at the University of Michigan. From the content of the essays and corresponding projects, the authors gained insight into the unique library and information needs and habits of these students. This knowledge was then used to inform and shape library programs and services aimed at future cohorts of undergraduate researchers.

The embedded librarianship approach was proven successful by Knapp, Rowland, and Charles (2014) within an integrative social sciences undergraduate research lab. Since incorporating a librarian, the authors found that the breadth of resources used by students has grown and the overall quality of their projects has improved. Noting how undergraduate research involvement often correlates with student success and retention, it was suggested that extending the embedded librarianship model into these experiences can “offer librarians a useful entry point to contribute to the academic mission of colleges and universities, and in a measurable way” (129).

Hayes-Bohanan (2013) described her experience as a librarian mentoring an undergraduate research project, overseeing a library student worker's development of a custom subject guide to support a newly created social justice program at Bridgewater State University. Through this for-credit project the student made an original contribution to the library and fulfilled an actual need while learning the skills and processes of critically evaluating, curating, and organizing pertinent resources. While it is not as common to see librarians assume the role of mentor, in part due to the fact that library science is not considered an undergraduate discipline, Hayes-Bohanan's example demonstrates that it can be done.

Undergraduate research at Hope College

Institutional profile

Founded in 1866 and located in Holland, Michigan, Hope College is a four-year, private, coeducational liberal arts institution affiliated with the Reformed Church in America. It has approximately 3,300 baccalaureate students with a student-faculty ratio of 13:1. Ninety-one

majors are offered among its four academic divisions—Arts, Humanities, Natural and Applied Sciences, and Social Sciences. Degrees offered include Bachelor of Arts, Bachelor of Music, Bachelor of Science, and Bachelor of Science in Nursing. The Arts and Humanities (separate divisions under a single dean, hereafter referred to jointly as “Arts and Humanities”) and Social Sciences divisions, whose students were expressly sought for the current study, are comprised of sixteen departments—four, five, and seven, respectively (See Table 1).

Table 1: Hope College Academic Departments by Division

Arts and Humanities	Social Sciences
<p style="text-align: center;">Arts Division</p> <p style="text-align: center;">Art and Art History</p> <p style="text-align: center;">Dance</p> <p style="text-align: center;">Music</p> <p style="text-align: center;">Theatre</p> <p style="text-align: center;">Humanities Division</p> <p style="text-align: center;">English</p> <p style="text-align: center;">History</p> <p style="text-align: center;">Modern and Classical Languages</p> <p style="text-align: center;">Philosophy</p> <p style="text-align: center;">Religion</p>	<p style="text-align: center;">Communication</p> <p style="text-align: center;">Economics, Management, and Accounting</p> <p style="text-align: center;">Education</p> <p style="text-align: center;">Kinesiology</p> <p style="text-align: center;">Political Science</p> <p style="text-align: center;">Psychology</p>

Hope has a well-established, amply supported, and nationally recognized undergraduate research program, as student-faculty collaboration has long been considered one of its distinguishing qualities. Lauding its “outstanding example” of a “highly successful program,” CUR executive officer, Nancy Hensel, called Hope a leader “in teaching students effectively through original research with members of the faculty and creative performance opportunities” (Hope College 2011). Since its humble beginnings in chemistry over sixty years ago, undergraduate research at Hope has evolved across the curriculum, becoming what is now a

highly valued college-wide enterprise in which students and faculty from all disciplines routinely participate. Gone are the days of “limited interest in integrating undergraduate students into research programs outside of science and mathematics at Hope” (Gentile 2000). The Social Sciences Division is now committed to a “[c]ritical mass of faculty engaged in collaborative scholarship with students” and “[a] placement for each student that desires one” (“Social Science” n.d.). Likewise, in the Humanities, efforts are being made to “expand research programs and opportunities beyond the classroom” (Hope College 2010). These commitments are evident through initiatives such as the annual “Social Sciences Young Investigators Award,” which recognizes excellence in student-faculty collaborative research and includes funding for winning teams to present at a professional conference. Also, the flourishing “Mellon Scholars” honors program for the digital arts and humanities was conceived to fully align with the undergraduate research model.

In addition to the many courses in Arts and Humanities and Social Sciences that include elements of undergraduate research, Hope has recently established a summer research program specific for these disciplines consisting of weekly luncheons, student presentations, and a culminating poster session and reception. Hope's undergraduate research students are also active presenters off campus. In recent years students have shared their work at venues such as the Michigan Academy of Science, Arts, and Letters (MASAL); the National Conference on Undergraduate Research (NCUR); and CUR's highly selective “Research on the Hill” in Washington, DC.

Malachowski (2003) asserts that, in order to “embrace a research-across-the-curriculum movement, measures need to be taken to ensure that undergraduate research and its outcomes receive more prestige on our campuses” (67). Hope's response to such a claim can be found, in part, at its annual “Celebration of Undergraduate Research and Creative Performance” (CURCP). Now in its thirteenth year, this much-publicized, high-profile interactive showcase provides students the opportunity to share their work with the college and local community by way of an afternoon-long poster session. A wide range of disciplines is represented, and in recent years, student participation has consistently been in the mid-300s.

The library and undergraduate research at Hope

Hope's library, including the archives, has been well integrated into a wide range of individual courses, but there have historically been few official partnerships connecting it to the undergraduate research program. The director of the archives has served as a project mentor on several occasions, and librarians have provided support to many undergraduate research students through various interactions; however, in general, direct library involvement, both in summer research programs and research-intensive courses such as capstones and honors seminars, has been inconsistent. One way the library has been increasing its support for undergraduate research in recent years is through its offering and administration of “Digital Commons,” Hope's institutional repository. Since 2010, Digital Commons has been including the abstracts and some posters of student projects presented at the CURCP. Beyond this, however, the library has been seeking ways to more intentionally work with the undergraduate research program at Hope, as, according to Stamatoplos (2009), this is simply “too important an area not to consider and target specifically” (239).

The current study

Purpose and intention

In effort to both illuminate existing library contributions and seek ways to further align library priorities with greater institutional goals and mission, the purpose of the current study was twofold: (1) to quantify and describe how students in the arts and humanities and social sciences reportedly make use of the library and value its contributions to their undergraduate research experiences; and (2) to identify ways in which the library might provide more targeted support to undergraduate research students and programs in these disciplines—specifically, to gauge student interest in the prospect of librarians playing an increased role in their research processes. The study's principal intention, then, was to use its findings to initiate conversations with key administrators such as the Provost, the Dean of Research and Scholarship, department chairs, and divisional deans regarding the present and future role of the library in this distinguished aspect of the college's academic program.

Methodology

In the fall of 2013, the author scheduled an informal meeting with the Dean of Research and Scholarship and her assistant to discuss the library's role in undergraduate research and to share tentative plans for the current study. Logistics and timeline were considered, and it was decided that the student roster of the 2014 CURCP would provide an appropriate and accessible sampling frame to draw from. Upon receiving approval from the college Human Subjects Review Board (HSRB) in the early spring 2014 semester, the study commenced,

employing a two-part, mixed-methods approach, including an online survey and semistructured focus group interviews.

Online survey

An online survey was created and distributed via e-mail to the 194 students who had submitted a mentored research project in an arts, humanities, or social sciences discipline to be presented at the 2014 CURCP. A spreadsheet containing student names and other applicable information (mentor, e-mail address, title of project, etc.) was provided by the office of the Dean of Research and Scholarship at the end of the month-long registration period. Student projects were identified as being affiliated with the Arts and Humanities or Social Sciences division according to their mentor's home department. The twenty-one students who submitted multiple projects were able to choose just one discipline upon which they would like to base their responses. In addition, fourteen students submitted research conducted during an interdisciplinary First Year Seminar (FYS) course. Based on topics and the department/discipline affiliation of all but one of the project mentors, submissions from this course were classified as "Social Sciences."

Congruent with the study's purpose, the survey was designed with two goals in mind. First, to quantify and describe library contributions to undergraduate research, a series of questions asked students to identify all of the library information sources, services, equipment, and physical spaces used or consulted at any time while working on their undergraduate research project. A separate question asked students to rate how formal library instruction has contributed to the development of their library research skills or overall ability to conduct

research. To gauge student interest in increased librarian involvement with undergraduate research, students were presented with three scenarios and asked how interested (“yes,” “no,” “or maybe”) they would be, or would have been, in each. They were also asked to recall which aspects of the research process they struggled with or found most frustrating. Finally, students were asked to assign an all-around “value” rating to the library based on their perception of its contribution to their undergraduate research experience and then again based on its contribution to their academic experience as a Hope student overall. All questions called for simple “checklist” (select all that apply) or “rating scale” answers, but optional text boxes were available for students to elaborate on their selections. General demographic and contextual information was also collected. The survey was left open for twenty-five days, and as incentive to participate, students who completed the survey were entered into a drawing to win an iPod Mini.

Focus groups

At the end of the survey, students were asked if they would be willing to participate in a forty-five- to sixty-minute follow-up focus group. Those who expressed interest were contacted via e-mail and were polled to determine availability. In the days leading up to the CURCP, two focus groups were scheduled, one for students identified as “Arts” or “Humanities,” (hereafter jointly grouped as “Arts and Humanities”) and one for “Social Sciences.” Several broad discussion topics were prepared in advance, but the format was intentionally semistructured, allowing for participants to expand on their answers, and, if so inclined, engage in a dialogue with one another. Both sessions were convened and recorded (audio only) by the author. Prior to commencing, participants were asked to sign an informed consent form that was previously

approved by the HSRB. The incentive to participate in the focus groups included food (pizza) and a \$10.00 gift certificate.

Findings: Survey

Respondents

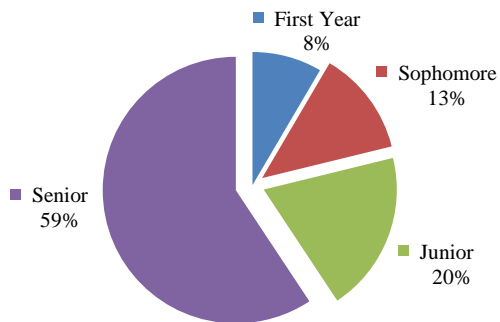
A total of 118 students took the survey, for a response rate of 61 percent. Respondents were 68 percent female and 32 percent male. A total of fifteen academic departments, and the previously mentioned FYS course, were represented, and the ratio of Arts and Humanities to Social Sciences was approximately 2:3 (See Table 2).

Table 2: Academic Affiliation of Survey Respondents

Art and Art History	1
Communication	6
Economics, Management, and Accounting	5
Education	6
English	10
First Year Seminar (FYS)	9
History	10
Kinesiology	30
Modern and Classical Languages	8
Music	3
Philosophy	2
Political Science	3
Psychology	15
Religion	5
Sociology and Social Work	3
Theatre	2
Arts and Humanities Division Total count (and approx. percentage of total sample, $n=118$)	41 (35%)
Social Sciences Division Total count (and approx. percentage of total sample, $n=118$)	77 (65%)
Total Sample	118 (100%)

Students from all class levels were represented, but seniors constituted the majority (59 percent) (see Figure 1).

Figure 1: **Class Level of Survey Respondents**



Reported library usage

An overwhelming 94 percent of all respondents reported using library information sources of some type in the process of working on their undergraduate research project. The two most commonly used source types were scholarly journals (87 percent) and databases (81 percent). At 53 percent, books were next, but whereas journal and database usage was comparable among students in both academic divisions, books were used at a substantially higher rate by those in the Arts and Humanities (93 percent) than by their counterparts in the Social Sciences (32 percent). Going down the list, this trend continued with Arts and Humanities students, who, on average, reported using a more diverse range of library sources in their research. Aside from the 0 percent reported usage of “Movies/DVDs” by Social Sciences students, every other source type given as an option was used to some degree (see Table 3).

Table 3: Library Information Sources (reported usage)

	Arts and Humanities count (and approx. percentage of total sample, <i>n</i> =41)	Social Sciences count (and approx. percentage of total sample, <i>n</i> =77)	Total count (and approx. percentage of total sample, <i>n</i> =118)
Scholarly Journals (online or print)	35 (85%)	68 (88%)	103 (87%)
Databases	36 (88%)	59 (77%)	95 (81%)
Books/eBooks	38 (93%)	25 (32%)	63 (53%)
Reference Sources (online or print)	15 (37%)	13 (17%)	28 (24%)
Magazines (online or print)	15 (37%)	10 (13%)	25 (21%)
Newspapers (online or print)	13 (32%)	8 (10%)	21 (18%)
Archives/Special Collections/Rare Books	9 (22%)	4 (5%)	13 (11%)
Movies/DVDs	6 (15%)	0% (0)	6 (5%)
Music Resources	5 (12%)	1 (1%)	6 (5%)
Other Library Sources	3 (7%)	1 (1%)	4 (3%)
Did not use library sources	1 (2%)	6 (8%)	7 (6%)

Several students shared in detail how each information source fit into their research process. For example, an English student wrote: “I used reference sources in the beginning stages of my research in order to develop my topic and understand its concerns well enough to plan what specifically I was interested in studying further. Then, I used library databases for books and scholarly articles related to my topic.” A history student shared that “printed books formed the backbone of my research material. However, I found most of these books through scholarly reviews and articles on online databases.” Of the twenty-nine comments left by social sciences students, fifteen specifically mentioned using library sources to complete their literature review or to locate previous/past studies or research. As a psychology student explained: “We used these to review previous literature that had done similar studies to what we hoped to do. We used their methods sections and results to form our own protocol for our own experiment.” Similarly, another wrote “We used these materials primarily to gain background knowledge of our research topic . . . and to reference prior literature for insights on how to design our studies.”

Table 4 shows that at 36 percent, the library service with the highest rate of reported use was interlibrary loan. Several comments reflected the overall helpfulness of this service, such as the modern and classical languages student who shared that “Getting books from other libraries is key to getting the best sources available for my project.” A music researcher said: “Interlibrary loan allowed me to access several, rare, very specific items I was looking for.” Individually, the Research Help Desk (32 percent), Research Consultations (9 percent), and Virtual Research Help (8 percent) each saw a lower rate of use, but together, these three branches of service, which fall under the greater category of “research help,” were used by a total of forty-five students, or 38 percent. An English student wrote: “I’ve only made an individual research appointment once, but I now wish I had done it more because it really helped me with narrowing the focus of my research and finding sources not available through the databases.” Also referencing a research appointment, one FYS student explained that “the librarian taught me very patiently.” Other services such as the Media Desk and TechLab also received praise in the comments section. For example, in describing the Media Desk, a psychology student said that it “has been a big help when making posters, and I appreciate the guides and information they have on their website.” Likewise, a history student explained: “I often utilize the 2nd floor media and tech services to check out equipment or ask questions seeing as the technological/digital aspects of my project are less familiar [to me] than the library research components.” Overall, Arts and Humanities students used library services at a higher rate than their Social Sciences counterparts. Only 12 percent of Arts and Humanities students reported not using any library services, compared to 42 percent in the Social Sciences.

Table 4: Library Services (reported usage)

	Arts and Humanities count (and approx. percentage of total sample, <i>n</i> =41)	Social Sciences count (and approx. percentage of total sample, <i>n</i> =77)	Total count (and approx. percentage of total sample, <i>n</i> =118)
Interlibrary Loan	25 (61%)	17 (22%)	42 (36%)
Research Help Desk	17 (41%)	21 (27%)	38 (32%)
Media Services Desk	19 (46%)	18 (23%)	37 (31%)
TechLab	13 (32%)	6 (8%)	19 (16%)
Research Appointment	8 (20%)	3 (4%)	11 (9%)
Virtual Research Help (email/chat/text)	6 (15%)	3 (4%)	9 (8%)
Other library services	2 (5%)	0 (0%)	2 (2%)
Did not use library services	5 (12%)	32 (42%)	37 (31%)

Students were also asked about the library technology/equipment and physical spaces they used while working on their undergraduate research project. Results from this section indicate that students came to the library primarily to access printers (75 percent) and computers (68 percent) as well as take advantage of the various “open” (68 percent) and “quiet” (47 percent) work spaces. Overall, this category saw greater balance between students in the two academic divisions: In both, 90 percent of the students reported using at least one of the options (see Table 5).

Table 5: Library Technology/Equipment and Physical Spaces (reported usage)

	Arts and Humanities count (and approx. percentage of total sample, <i>n</i> =41)	Social Sciences count (and approx. percentage of total sample, <i>n</i> =77)	Total count (and approx. percentage of total sample, <i>n</i> =118)
Printers/Copiers/Scanners	29 (71%)	60 (78%)	89 (75%)
Computers/Computer Lab	22 (54%)	58 (75%)	80 (68%)
Open tables or chairs	29 (71%)	51 (66%)	80 (68%)
Quiet study rooms or carrels	27 (66%)	28 (36%)	55 (47%)
Rental tech equipment (cameras, iPads, etc.)	6 (15%)	2 (3%)	8 (7%)
Microfiche Reader	4 (10%)	0 (0%)	4 (3%)
Other library technology or space	2 (5%)	0 (0%)	2 (2%)
Did not use library tech/equipment or physical spaces	4 (10%)	8 (10%)	12 (10%)

Of the twenty-two comments left in this section, fourteen specifically expressed appreciation of the library as a place to study or work. Five of these mentioned using the library as a place to meet with their group or fellow researchers/peers. As one history student put it, “The library has always been a good space for me to meet with either my mentor or interview subjects to have project-related meetings, but it is also a place where I can meet and work alongside my peers so that we can keep each other accountable.”

Library instruction

Table 6 shows how students perceived the level of value added by formal library instruction sessions to the development of their library research skills or ability to conduct research in general (1 = *very low value*, 5 = *very high value*).

Table 6: Value of Library/Research Instruction Sessions (1= very low value, 5 = very high value)

	“Low”		“Neutral”	“High”		\bar{x}
	1	2	3	4	5	
Arts and Humanities count (and approx. percentage of total sample, n=39)	1 (3%)	1 (3%)	23 (59%)	10 (26%)	4 (10%)	3.385
Social Sciences count (and approx. percentage of total sample, n=73)	7 (10%)	7 (10%)	25 (34%)	24 (33%)	10 (14%)	3.315
Total count (and approx. percentage of total sample, n=112)	8 (7%)	8 (7%)	48 (43%)	34 (30%)	14 (13%)	3.339
<i>Six students (2 arts and humanities, 4 social sciences) reported that they had not attended any library instruction sessions, thus reducing the samples in this section. Percentages may not total 100% due to rounding.</i>						

Forty-three percent of those who reported having had library instruction ($n = 112$) responded either with a 4 or 5 (*high value*). Only 14 percent responded with a 1 or 2 (*low*

value). Another 43 percent answered with a 3 (*neutral*), resulting in an overall mean rating of 3.339. Looking at mean ratings only, one sees very little discrepancy between Arts and Humanities ($\bar{x} = 3.385$) and Social Sciences ($\bar{x} = 3.315$) students, but the responses of the latter were noticeably more polarized, with 20 percent in the *low value* range, 47 percent *high value*, and only 34 percent *neutral*. Arts and Humanities students gravitated more toward a *neutral* rating of library instruction.

Thirty students provided comments on their experiences with library instruction, most of which had a positive tone, using words such as: “essential,” “useful,” “invaluable,” “beneficial,” and “crucial.” One of the FYS students stated: “As a first year, minus that instruction I would not have been able to complete my project.” A philosophy student claimed that the “most impactful experience was when a librarian came into class to discuss research techniques and varied search engines.” It was interesting to note, however, that this same student gave a *neutral* rating of 3 in this category. Others, too, who described their experiences with library instruction in decidedly positive terms, were reluctant to rate them as a 5. Several students implied that there is a need for more library instruction, such as the English student who wrote that “everyone should have library instruction sessions, and more of them,” or the education student who attended only one session as a freshman but would have appreciated a “reminder session around junior year.” One comment that stood out in particular came from a political science student who described library instruction as “helpful” but went on to say that the “vast majority of my research skills have come from individual help from a librarian.” The few comments that could be considered *neutral* or leaning toward *negative* were from students who felt that they could have eventually figured things out on their own without having had

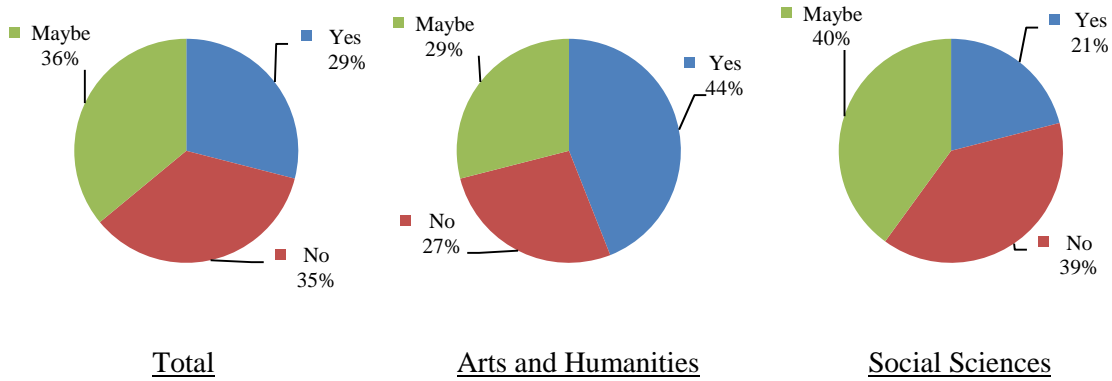
formal instruction or that the sessions were, as one student wrote, “quite general in nature.” One student wrote that, the sessions are “relatively helpful,” but that “a lot of the time I am already aware of the resources they talk about.” Another said: “I would have appreciated a session that was a little more specific.”

Potential future librarian involvement in undergraduate research

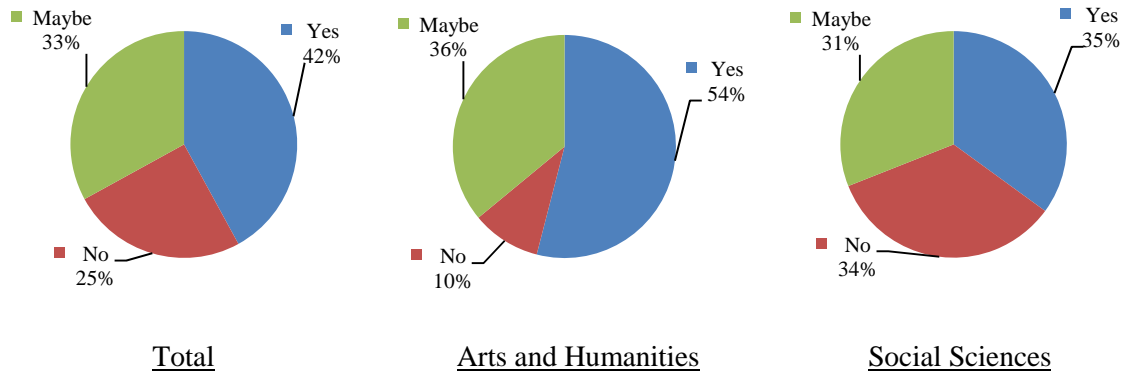
Three questions were aimed specifically at gauging students’ level of interest in the prospect of librarians becoming more involved in undergraduate research (see Figure 2). Of these, the most popular scenario, drawing a higher percentage of “Yes” answers than the other two, both overall (42 percent) and by students in each of the sample groups (Arts and Humanities = 54 percent, Social Sciences = 35 percent) was that of having a “personal” research librarian connected to their project. In all three scenarios, the number of students who answered “Yes” or “Maybe” was greater than those who chose “No.” The highest percentage of “No” responses, overall (35 percent), came in response to the idea of having regular research “check-ups” with a librarian at various stages of their research. Cross-tabulation revealed that four out of the six students who marked “I have not had any formal library instruction” in the previous section answered “Yes” to the third scenario here, which asked if they would be interested in workshops on specific library research tools/topics.

Figure 2: “Would you be (or would you have been) interested in the following:

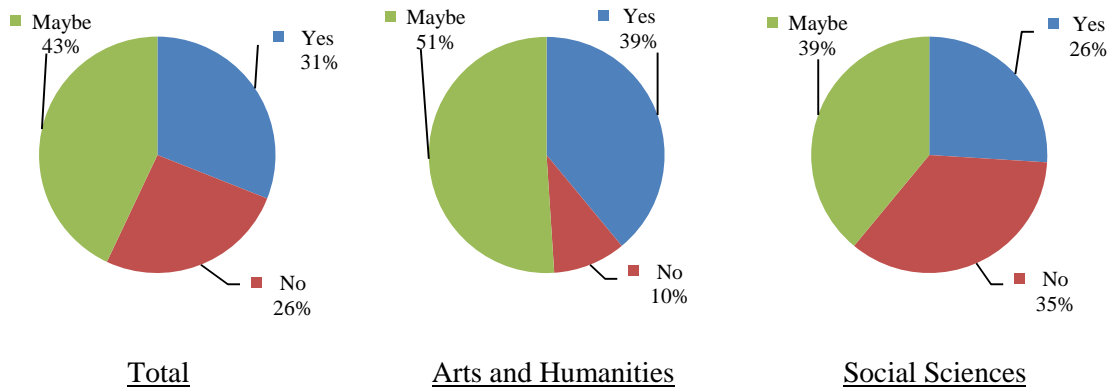
1. Regular research “check-ups” with a librarian at various stages of your project?



2. A “personal” research librarian connected to your project who you could consult/contact directly with any questions/issues?



3. Workshops on specific library research tools/topics?



Most difficult/frustrating aspects of the research process

In this section, students were asked to identify which aspects of the research process they found most difficult or frustrating (see Table 7). At 39 percent, “Finding good/relevant information” received the overall highest response rate. Second was “Narrowing down a topic” (35 percent), but for Arts and Humanities students who selected this option at a rate of 56 percent, this was clearly the area in which most students struggled. “Gaining full access to information found” was third, with both groups responding equally at a rate of 27 percent. The fourth highest overall was “Constructing a search strategy” (25 percent), but here, again, a higher percentage of Arts and Humanities (39 percent) students selected this option than did Social Sciences students (17 percent). However, the next four most commonly identified difficult or frustrating aspects (“Finding enough information,” “Formatting citations/references,” “Choosing a topic,” and “Deciding whether sources are credible/reliable/appropriate”) each saw students in the social sciences reporting at a higher rate. Finally, 12 percent of Arts and Humanities students, and only 1 percent of social sciences students, chose “Finding information in the library.”

Table 7: Most Difficult/Frustrating Aspects of the Research Process

	Arts and Humanities count (and approx. percentage of total sample, <i>n</i> =41)	Social Sciences count (and approx. percentage of total sample, <i>n</i> =77)	Total count (and approx. percentage of total sample, <i>n</i> =118)
Finding good/relevant information	15 (37%)	31 (40%)	46 (39%)
Narrowing down a topic	23 (56%)	18 (23%)	41 (35%)
Gaining full access to information found	11 (27%)	21 (27%)	32 (27%)
Constructing a search strategy (such as in a database)	16 (39%)	13 (17%)	29 (25%)
Finding enough information	7 (17%)	18 (23%)	25 (21%)
Formatting citations/references	5 (12%)	11 (14%)	16 (14%)
Choosing a topic	4 (10%)	10 (13%)	14 (12%)
Deciding whether sources are credible/reliable/ appropriate	3 (7%)	7 (9%)	10 (8%)
Finding information in the library	5 (12%)	1 (1%)	6 (5%)
Other	0 (0%)	5 (6%)	5 (4%)
None of the above	0 (0%)	10 (8%)	10 (8%)

Overall library value

The final two questions aimed to gauge students' perceptions of library value "as a whole" (see Table 8). The first of these asked students to rate library value specifically as they saw it revealed in their undergraduate research project. The second question also asked students to rate library value, but more in a broader sense—considering their "overall academic experience as a Hope College student" (1 = *very low value/nonessential*, 5 = *very high value/essential*). To the first question, the majority (53 percent) responded with a 4 or 5 (*high value*) and 20 percent with a 1 or 2 (*low value*). Twenty-seven percent gave a neutral 3, resulting in an overall mean rating of 3.449. Cross-tabulation revealed that exactly one-half of the students who previously reported not having any formal library instruction were among the students who answered this question with a 1. Here again, as found in the section on library instruction, mean ratings were comparable between the two groups (Arts and Humanities = 3.879, Social Sciences = 3.221). Another interesting cross-tabular finding was that the mean rating given by students who reported having an individual research consultation with a librarian was 4.333. The second question drew a higher overall mean rating of 4.118, and again there was little discrepancy (Arts and Humanities = 4.171, Social Sciences = 4.078). Not a single student responded with a 1 to the second question.

Table 8: Overall Library Value (1 = very low value/non-essential, 5 = very high value/essential)

		"Low"		"Neutral"	"High"		mean
		1	2	3	4	5	\bar{x}
Arts and Humanities count (and approx. percentage of total sample, n=41)	Library value, UR project	1 (2%)	2 (5%)	10 (24%)	16 (39%)	12 (29%)	3.879
	Library value, academic experience in general	0 (0%)	2 (5%)	5 (12%)	18 (44%)	16 (39%)	4.171
Social Sciences count (and approx. percentage of total sample, n=77)	Library value, UR project	8 (10%)	13 (17%)	22 (29%)	22 (29%)	12 (16%)	3.221
	Library value, academic experience in general	0 (0%)	7 (9%)	7 (9%)	36 (47%)	27 (35%)	4.078
Total count (and approx. percentage of total sample, n=118)	Library value, UR project	9 (8%)	15 (13%)	32 (27%)	38 (32%)	24 (20%)	3.449
	Library value, academic experience in general	0 (0%)	9 (8%)	12 (10%)	53 (45%)	44 (37%)	4.118

Percentages may not total 100% due to rounding.

Findings: Focus groups

Forty-six students expressed via the survey that they would be willing to participate in a focus group; twenty-four responded to the follow-up poll that was sent to schedule specific dates and times. Ultimately, two focus groups were scheduled: the first consisting of nine students in the Arts and Humanities and the second with only three in the Social Sciences.

Both groups opened by students being asked to provide a brief overview of their project (i.e., title/topic, discipline, findings, etc.). This quickly transitioned into a discussion about the library and its role in their undergraduate research experiences. Responses here generally matched the trends found in the survey. All three students in the Social Sciences group mentioned using library databases to find and access journal articles for their literature review, whereas the combination of source types used by Arts and Humanities students varied greatly

from project to project (books, journal articles, databases, archival collections, films, rare books, book reviews, and newspapers). Students in both groups reported using library computers, printers, and study spaces at various times while working on their projects. Students in both groups also reported using, or their intent to use, the Media Services Desk for printing their poster for the upcoming CURCP.

When asked to expand more about the research process, a Social Sciences student explained that finding relevant articles for a literature review can be “easier said than done at times. . . . It seemed that *every* good article was either unavailable or it was one of those things that you have to come up to the Research Help Desk . . . ” He then said that his group did not use interlibrary loan for articles they could not access, specifically stating, “Yeah, we definitely did not look outside of the Hope library.” Another told of how she found journal articles both by using library databases and Google Scholar, where she was pleased to find that she could easily identify which ones were available at Hope. The same student said that when she was off-site and unable to find or access an article, she would routinely use the library chat service to get help. The other two students were unaware of this service.

Also related to access issues, a student credited a library instruction session with his knowing how to link from PubMed to the library's full-text journal holdings. Prior to this, he had always limited his results to only those that were available directly on the PubMed platform. One student stated that he finds himself in the physical library “daily.” When asked if this was mainly for printing and copying, he said “Yeah, but I use the books a lot, and I think a lot of people don't appreciate the value of that.” This comment stood out in particular for its stark

contrast to what was seen in the survey regarding the use of books in the Social Sciences. He recalled a time when he came across a book, one that he described as the “gold standard” for the topic he was researching, and said that he thinks most students find it easiest to do all their research from their computer, but “it isn't, sometimes . . . sometimes the path of least resistance is walking downstairs [to the section of the library where books on this subject can be found].” He continued, “I was blown away when I found out how much was down there in the basement.”

In the Arts and Humanities group, a student told of how she often “requested books from other libraries” and spent time in the archives where, among other things, she looked through “lots and lots of [student newspaper] articles.” Another said that he relied heavily on two specific full-text newspaper digital archives made available through the library, as well as several books obtained through interlibrary loan. One student's sources were found primarily in the digital archives of other academic libraries, but she was able to find many books at Hope that provided her with secondary source information and scholarship pertaining to her topic. Another shared how a librarian helped her search WorldCat to find additional library holdings and information pertaining to some of the rare books she was looking at in Hope's collection. Through this interaction she found a library that owned an original copy of a book for which Hope has a reprint, and then proceeded to make the trip to see it in person. One of the students did most of her research while studying abroad where she used local library resources, but she also accessed Hope's “online articles” remotely, which helped in developing her “theoretical framework.” Six of the nine students in this group, several of whom specifically commented on their reliance on the library's TechLab for assistance with the “digital” aspects

of their project, were doing their research as part of the Mellon Scholars program. It was suggested that the TechLab establish an “appointment system” so students could designate time when they know that they can get help on a specific aspect of their project. In addition, a student mentioned that having a “full-time librarian stationed in the TechLab” devoted to digital scholarship and educational technologies would make a nice addition.

When discussing the role and value of librarians in undergraduate research, students opened up about their experiences (or lack thereof) with library instruction, research appointments, and the research help desk. One student, a double major in the Social Sciences, shared that neither her capstone nor honors seminar included library instruction. Her undergraduate research project was done during her honors seminar, but for the research in both classes, she had to rely on skills she learned in a library session she attended during a course she had taken two years prior. As for working with librarians at the Research Help Desk, one student mentioned that she sometimes finds it “intimidating” to approach. This led into a discussion about working with librarians in a more formal arrangement. A student recalled an appointment she had with a librarian while taking a discipline-specific research methods class, crediting the experience with “making [her] sources so strong.” Further, she suggested that meeting with a librarian should be a required component of “research” courses and that, by doing so, “it would improve the literature review, it would improve how you're doing your actual research, and it will give you a better understanding. . . . I think that would help me.” The other two students in the group concurred. In reference to her faculty mentor, one said “Yeah, she probably should have required us to meet with a librarian, now that I think about it.” One student used the word “partnership” to describe how she envisioned the librarians’ role in

undergraduate research. Contrasting formal library instruction sessions with individual research consultations, a student explained that in lower-level courses students are just learning how to use the library and do research in general, together, but “by the time we are seniors we are doing very individualized research, and it's so specialized . . . it couldn't be [that] you come into the class and help us all, because everyone's [research] is so specific.”

A student in the Arts and Humanities group said that she was unsure of “how to approach [a librarian] to ask them, and to invite them into my project.” She was also unsure of how librarians would “respond” to her topic and the type of information she was looking for. She continued to say that “having a structure there to have someone who I know would support me . . . would have been, I think, very helpful.” This was followed by four other students commenting, in sequence, on their personal experiences with librarians or how they would have liked to have had more librarian support. A student who claimed to be a “super independent worker” admitted that she often ends up “floundering” but would have “appreciated working with someone in depth.” Although this student did schedule one appointment with a librarian, she thought that it “would have been even more beneficial to meet with [a librarian] on a regular basis to review the materials I was looking at . . .” Another said that her experience working with a librarian “made me realize that having the expertise of a librarian, especially early on in my research project, was really helpful and would have been really helpful for, you know, like, past research projects that I've done, too.” She described how “having a librarian to consult with was especially helpful” in learning “the lay of the land” in terms of the sources available in her field. This was affirmed by the next student who said that “I think it is the early stages when you're, like, just sort of trying to get your feet wet and try to

figure out how you're going to approach, you know, whatever this research is, that it's most helpful" to consult a librarian. She continued to explain how it is this stage when she feels "shaky" and "not confident" and worries about appearing unprepared. When asked if increasing the visibility of librarians' availability to work one-on-one with students via research appointments would be a good idea, the response was a unanimous "yes." Interestingly, one student commented on how librarians' offices are tucked away behind a wall that is "never really open" and how it does not seem like a place where students were "allowed" to go. Another said that she only recently learned where the librarians offices were and "had no idea" that they were just behind the Research Help Desk. She contrasted this to how her faculty mentor's office, like those of other professors, seems much more accessible so that there is a greater sense that she can drop by to talk about her research (during scheduled office hours).

Discussion

The survey and focus groups supplied a rich data pool from which library contributions to undergraduate research in the arts and humanities and social sciences at Hope College can be highlighted. Despite noted differences in how students reported using the library, the overwhelming majority were able to identify multiple ways (sources, services, equipment, and spaces) in which it directly impacted their research experience. An important observation can be made by comparing Tables 1 through 4 with Table 8. Although students in the arts and humanities, overall, reported using the library at a far higher rate and for more diverse purposes than did those in the social sciences, the discrepancy in mean library value rating between the two groups is only 0.6. On average, students rated the library higher for the value it added to their "overall academic experience" than they did for its value directly related to

their undergraduate research project. As noted, on several occasions during both focus groups, students voluntarily veered away from the central focus (i.e., the library and their current undergraduate research project) to share past positive experiences and interactions with the library and librarians over the course of their time at Hope. In this, students were evoking a more holistic view of library value and how the library and librarians have impacted their education. Considering that many of the skills librarians teach are intended to be transferable to future research and information scenarios beyond a singular point of need, the cumulative effect of these non-undergraduate-research-specific experiences could, therefore, reasonably be considered incidental, or indirect, value added to what students' carried over into their projects.

The highest reported nonuse rate overall—the only one greater than 10 percent—in any of the categories (sources, services, equipment, and spaces) was found in “services,” where 31 percent of the total sample selected the “I did not use any” option. Low reported use of a particular library service, however, cannot be taken to mean that there is a low need or want. An example of this was seen in the Social Sciences focus group when the student who admitted to not using interlibrary loan or the research help desk, while admitting to passing up many of the best articles. Although this was the reported experience of just one student, he was speaking on behalf of others collaborating on the same research project. In addition, data revealed in Table 8 indicate that students acknowledge the fact that they struggled with multiple aspects of the research process, all of which are aspects with which librarians and the various research help services are well suited to assist. A later cross-tabulation revealed that only four of the forty-six students who expressed difficulty or frustration in finding

good/relevant information reported making a research consultation with a librarian. Similarly, only eight of the thirty-two students who selected “Gaining full access to information found” reported using their library's interlibrary loan service. The same can be said for the low use of certain source types and how this does not necessarily equate to a low need. This was supported by the student in the Social Sciences focus group who shared how books have proved to be invaluable to his research and that he believes library books are underused by most students in his discipline.

With 43 percent of students rating their experiences with library instruction as “positive” (and only 10 percent “negative”), it is apparent that librarians’ formal classroom teaching efforts at Hope are having an impact on, as was written in the survey, students’ “development of library research skills or ability to conduct research in general.” However, with a mean response of only 3.339 (out of 5), there is room for improvement in this area. As mentioned earlier, librarian involvement in undergraduate research, whether in summer programs or research-focused courses, has been inconsistent. This includes library instruction. It is therefore highly probable that many of the students surveyed had never received library instruction designed specifically to meet the needs of their undergraduate research project, or even subject area, and were basing their response on sessions in general education or other courses in the past. Additional support for this assertion was seen in the Social Sciences focus group by the double major who shared that neither of her senior research courses included library instruction. This knowledge, along with survey data showing 31 percent of students expressing definite interest (“Yes”) in more specific library “workshops” would suggest that there are opportunities worth exploring here.

Several students' comments, both in the survey and focus groups, pertaining to their use of the library's TechLab are indicative of the way research production and dissemination are changing and how the library is fostering the "digital humanities," or "digital liberal arts"—a thriving component of Hope's undergraduate research program. The library has since created and commenced a search for a "Digital Liberal Arts Librarian" position (full-time faculty). This position will work in close collaboration with the TechLab and lend support to both students and faculty incorporating emerging technologies into their scholarship and other endeavors.

At Hope, close student-faculty relationships, and in the case of undergraduate research, collaboration, are valued and indeed expected. The provost has referred to this as "academic intimacy," and one of the college's "distinctions." Hope librarians are keenly aware of this and have for some time been looking to become more meaningfully embedded at key points throughout students' academic experiences. Data uncovered in both stages of this study indicate that there is a place, and desire, for librarians to extend their influence in undergraduate research. While only 9 percent of the students reported actually making a research appointment, arguably the most custom-tailored of all research services offered at the library, far more expressed interest ("Yes") in both the "personal librarian" (42 percent) and the "regular research check-ups with a librarian" (29 percent) option. This differential between actual use and expressed interest in this type of interaction with librarians is also visible when looking at the two sample groups' selections individually. Why, then, if so many students expressed interest in some form of formal collaboration with a librarian, did so few report (via the survey) actually taking the initiative to meet with one while working on their undergraduate research project? In the focus groups, where there was even more palpable enthusiasm for

librarian involvement in undergraduate research, there was also a clear, underlying sense of uncertainty in knowing when and how students should approach a librarian for this level of support. Isbell (2009) describes a system where honors students are required to meet with a librarian for a research consultation at the beginning of their thesis work. Faix, McDonald, and Taxakis (2014) found that senior capstone students benefit more from in-depth research consultations than freshmen due to their ability to absorb and make sense of larger amounts of information. Students in the freshmen composition course, they found, were more prone to becoming overwhelmed and confused by the number of sources being explored in consultations. Considering the findings of the current study, and the college's emphasis on student-faculty "academic intimacy," establishing a more systematic approach to setting up undergraduate research students with librarians for consultations is one option that should be explored. The noted finding that students who scheduled a consultation rated library impact on undergraduate research, on average, higher than those who did not, is especially telling.

Limitations and implications for future study

Although this study achieved its goal of describing students' use of the library and how they value its contributions to undergraduate research, it was limited to student self-reporting rather than direct measures of impact or causality. A future investigation of libraries and undergraduate research might look to probe deeper into data cross-tabulation to produce even more granular findings and observations. Because the survey was administered midway through the semester, students' responses were based on their experiences up until that point. Predicting how they might eventually use the library would be difficult and is therefore a

noteworthy limitation of the data that were collected. Additionally, studies of this nature need to be aware of the “self-selecting” factor when considering participants. In the current study, this was especially a concern in the focus groups. While the qualitative data gathered in these groups provided valuable insights, it cannot be assumed that these students are representative of the greater body of undergraduate researchers.

It has been suggested that citation analysis can be an effective form of library “value” research (Bowles-Terry 2013). Originally, this study planned to incorporate a citation analysis of student posters presented at the CURCP, but it was decided to consider this for a future study of its own, perhaps looking at several years of undergraduate research posters placed in the institutional repository. Additionally, a study involving the faculty mentors would provide a more holistic picture of how the library is being used and valued by all those involved in an undergraduate research project. A comparison of students who worked directly with a librarian with those who did not would also make for an interesting follow-up study.

Conclusions

The undergraduate research program at Hope College proved to be a propitious lens through which to view current library contributions to an important aspect of the greater institutional mission. This study has provided ample data showing how the majority of students’ projects were directly impacted by the library or librarians in some way. In many cases, especially when looking at source usage, it would not be an overstatement to say that their projects simply would not have been possible without the library. Considering the integral role of undergraduate research at Hope, these findings help satisfy, in part, the primary charge of

ACRL's "Values" initiative: "How does the library advance the missions of the institution?" (Oakleaf 2010). While present contributions are notable, there is also room for the library to expand its support for undergraduate research. This study will be instrumental as librarians begin to work toward forging a greater level of collaboration with the various undergraduate research programs and initiatives. The compelling evidence that a good number of students would have welcomed a closer connection with a librarian to receive help on specific aspects of their undergraduate research experience will be especially useful and drawn upon in future communications with applicable partners on campus.

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