






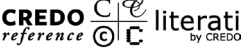













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Ithaca S+R US Faculty Survey 2012

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Ithaka S+R is a strategic consulting and research service provided by ITHAKA, a not-for-profit organization dedicated to helping the academic community use digital technologies to preserve the scholarly record and to advance research and teaching in sustainable ways. Ithaka S+R focuses on the transformation of scholarship and teaching in an online environment, with the goal of identifying the critical issues facing our community and acting as a catalyst for change. JSTOR, a research and learning platform, and Portico, a digital preservation service, are also part of ITHAKA.

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Preface

Ithaka S+R's Faculty Survey has been tracking the attitudes and practices of faculty members at US colleges and universities for more than a decade. Faculty members today can utilize a growing set of new research methods and pedagogies, and they can adopt increasingly seamless digital information usage and dissemination practices. Consequently, the analysis of their attitudes and behaviors, tracked systematically over time and broken down by institutional type and discipline, is incredibly important to best serving their needs.

Previous cycles of this project have covered topics such as discovery, the print to electronic transition for scholarly journals, and the value of the library, generating substantial community impact. For the 2012 survey cycle, the questionnaire also includes coverage of support service needs associated with changing research methods, data preservation, research dissemination, and undergraduate instruction, as well as the role of the ebook. We hope these findings will continue to serve the higher education community as it grapples with the waves of change facing many of these vital areas.

The present cycle of this survey program is distinguished in several important ways that we hope will serve to deepen its impact for higher education broadly and individual colleges and universities specifically. For the first time, we developed the thematic coverage of the questionnaire in conjunction with an advisory board of librarians, publishers, and a scholarly society executive, to ensure that we are tracking the right set of strategic issues. In addition, during the 2012-2013 academic year, we have piloted a version of this survey instrument with 11 colleges and universities across the country that hoped to understand the views of their own faculty members in comparison with the broad national sample analyzed in this report. With the successful completion of these pilots, Ithaka S+R will be offering a local surveying service for colleges and universities that wish to examine the services needs of their faculty members today and going forward.

In addition to these efforts to deepen the program's impact in the US, we have for the first time (in conjunction with Jisc and Research Libraries UK), undertaken a parallel surveying effort for the UK. Findings from that project will be released in May, 2013.

The US national survey has helped the higher education community track the changing needs of its faculty members for some time, and we hope that the data from the 2012 cycle reported here will contribute to an ongoing assessment of strategies to support them.



Deanna Marcum
Managing Director
Ithaka S+R

Executive Summary

In this fifth cycle of the Ithaka S+R Faculty Survey, US, we once again survey a random sample of US higher education faculty members to learn about their attitudes and practices related to research, teaching, and communicating. This survey has some new and distinctive features: the questionnaire was developed with input from an advisory committee, and the methodology was revised to take advantage of online distribution and responses. Given levels of response, findings can be analyzed by discipline, institution type, and other demographic characteristics.

Key Findings

- The role of internet search engines in facilitating discovery of scholarly resources has continued to increase. The perceived decline in the role of the library catalog noted in previous cycles of this survey has been arrested and even modestly reversed, driven perhaps to some degree by significant strategic shifts in library discovery tools and services.
- Respondents are generally satisfied with their ability to access the scholarly literature, not least because freely available materials have come to play a significant role in meeting their needs.
- While respondents continued to trend overall towards greater acceptance of a print to electronic transition for scholarly journals, they grew modestly less comfortable with replacing print subscriptions with electronic access. Monographs, although widely used in electronic form, present a mixed picture for any possible format transition. While some monograph use cases are quite strong for electronic versions, others - especially long-form reading - are seen to favor print by a decisive share. Even so, a growing share of respondents expects substantial change in library collecting practices for monographs in the next five years.
- Respondents' personal interests are the primary factor in selecting research topics, but junior faculty members report that tenure considerations play an important role, as well. Collaboration models vary significantly across scholarly fields. While humanists are less likely than scientists or social scientists to conduct quantitative analyses, nevertheless some 25% of humanists report gathering their own data for this purpose.
- Small but non-trivial shares of respondents use technology in their undergraduate teaching. But while most recognize the availability of resources to help them do so, many respondents do not draw upon resources beyond their own ideas or feel strongly motivated to seek out opportunities to use more technology in their teaching.
- Respondents tend to value established scholarly dissemination methods, prioritizing audiences in their sub-discipline and discipline, and those of lay professionals, more so than undergraduates or the general public. Similarly, they continue to select journals in which to publish based on characteristics such as topical coverage, readership, and impact factor. Finally, respondents tend to value existing publisher services, such as peer review, branding, and

copy-editing, while expressing less widespread agreement about the value of newer dissemination support services offered by libraries that are intended to maximize access and impact.

- Respondents perceive less value from many functions of the academic library than they did in the last cycle of this survey. One notable exception is the gateway function, which experienced a modest resurgence in perceived value. A minority of respondents sees the library as primarily responsible for teaching research skills to undergraduates. And, though still a clear minority, the share of respondents who wish to see substantial change to library staff and buildings has increased. There are large differences in perceptions between disciplinary groups: for example, a smaller share of scientists views many library roles as very important.
- Conferences remain at the heart of respondents' perceptions of the role and value of the scholarly societies in which they participate. Conferences are valued for both the formal function of discovering new scholarship and informal role of connecting scholars with peers.

Introduction

The Ithaka S+R Faculty Survey has examined the attitudes and behaviors of scholars at four-year colleges and universities across the United States on a triennial basis since 2000. It provides the higher education community with a regularly updated snapshot of its faculty members at a moment in time, as well as trend analysis of changes. Our objective is to provide universities and support services, such as academic libraries, learned societies, and scholarly publishers, with timely findings and analysis that help them plan for the future. This report covers findings from the fifth cycle of the Ithaka S+R Faculty Survey, which we fielded in the fall of 2012.

Ithaka S+R's Faculty Survey is a tool for tracking attitudes and self-reported practices of scholars on a variety of issues over time. The survey's broad coverage of the faculty member population across the US, and its ability to provide disciplinary and institutional type stratifications, provide for an unusual depth of analysis. For the first time, the survey was conducted using email invitations and a web-based survey platform, as we describe in greater detail in the methodology section below.

Previous cycle of the Faculty Survey have been designed to help the higher education community understand the changing needs of faculty members as they relate to key issues such as the discovery process, collecting and collections, the value of the library, and publishing.¹ For the 2012 survey cycle, working with an advisory board of librarians, publishers, and a scholarly society executive (listed in the acknowledgments section below), we updated the questionnaire to include topics of current and emerging interest, which include support service needs associated with changing research methods, data preservation, research dissemination, and undergraduate instruction, as well as the role of the e-book in research and teaching. Our questions asked participants to choose among pre-defined lists of attitudes or practices, providing a quantifiable response reflecting their own attitudes and practices. The Faculty Survey was designed in light of, and can therefore be read in conjunction with, recent qualitative, exploratory, and in-situ projects, such as those that comprise Ithaka S+R's research support services program, which explore the practices and needs of individual scholarly fields in depth.²

Methodology

This report covers the 2012 cycle of the Ithaka S+R Faculty Survey, and in this section we describe the 2012 methodology.

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- 1 These studies were reported in: Roger C. Schonfeld and Ross Housewright, *Faculty Survey 2009: Strategic Insights for Librarians, Publishers, and Societies* (New York: Ithaka S+R, 2010), available at <http://www.sr.ithaka.org/research-publications/faculty-survey-2009> and Ross Housewright and Roger C. Schonfeld, *Ithaka's 2006 Studies of Key Stakeholders in the Digital Transformation in Higher Education* (New York: Ithaka, 2008), available at <http://www.sr.ithaka.org/research-publications/faculty-survey-2006>.
 - 2 Jennifer Rutner and Roger C. Schonfeld, *Supporting the Changing Research Practices of Historians* (New York: Ithaka S+R, 2012), available at <http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-historians>, and Matthew Long and Roger C. Schonfeld, *Supporting the Changing Needs of Academic Chemists* (New York: Ithaka S+R, 2013), available at <http://sr.ithaka.org/research-publications/supporting-changing-research-practices-chemists>.

This cycle marks a shift to email-based invitations and an online survey instrument, whereas in previous cycles we had mailed invitation letters with a paper-based questionnaire. Recognizing that the paper survey approach was not serving us as well as it once did and that an online methodology would provide greater flexibility, we began following the 2009 cycle to assess the opportunity to mount this methodology shift. It was important to retain consistency so we could compare findings over time, so we conducted a test survey in spring 2010 to confirm that responses from this online methodology could be compared with the previous paper-based methodology. We found that patterns of response among key demographic groups and in questions tracked over time remained consistent between paper and digital survey methods.

Sample, recruitment, and response levels

Since the inception of the Faculty Survey, our sample has been based on the population defined by the database of US faculty members' contact information maintained by MDR, a marketing names list vendor. MDR is the only vendor we are aware of that is able to provide contact information for scholars on a sufficiently large scale to support this model of a survey. While it is impossible to determine this database's precise coverage of the overall population of US faculty members, the number of faculty names contained in MDR's list is fairly similar to the overall number of faculty in the US, according to the National Center for Education Statistics.

Our sampling strategy for 2012 took into account a number of factors. Within MDR's overall population, we limited our sample to faculty members at four-year colleges and universities, specifically at institutions in the following eight Carnegie Classes: Baccalaureate Colleges—Arts & Sciences; Baccalaureate Colleges—Diverse Fields; Master's Colleges & Universities (small programs); Master's Colleges & Universities (medium programs); Master's Colleges & Universities (large programs); Doctoral/Research Universities; Research Universities (high research activity); and Research Universities (very high research activity). Within these institution types, our sample broadly covered the arts and sciences fields, and the professions, with the notable exception of health sciences and agriculture. A total of 424,937 individuals met the criteria for our population.

We anticipated a drop-off in response rate with the move to an electronic survey, because respondents are much less likely to respond to email survey invitations. A pre-test, sent to 1,098 faculty members in August 2012, confirmed these expectations and helped us to craft our overall sample to reach desired levels of responses. Based on this pre-test, we increased the number of invitations we sent out over past cycles, in order to reach acceptable numbers of responses, both overall and in key disciplines.

Invitations were emailed to a sample of 160,008 randomly selected faculty members from among this overall population during the week of September 10th, 2012. A reminder message was emailed to all of those who had not yet completed the survey one week later. In certain fields, we worked with a leader of a key scholarly society, under whose name the invitation and reminder emails were

sent to all individuals in the associated field (James Grossman of the American Historical Association for history faculty members, Linda Downs and Anne Collins Goodyear of the College Art Association for art history faculty members, and Rosemary Feal of the Modern Language Association, Kent Williamson of the National Council of Teachers of English, and Martha Abbott of the American Council on the Teaching of Foreign Languages, for languages and literatures faculty members). For other fields, invitation and reminder emails were sent from Deanna Marcum, managing director of Ithaka S+R.

The survey was closed after one month, on October 15, 2012. In total, we received 5,261 responses. We analyzed the balance in coverage of responses by discipline and institution size. Our response rate varied by discipline, when calculated against MDR-assigned disciplines, most markedly because of the effectiveness of scholarly societies in reaching scholars in their fields. For those fields with an invitation from a society leader, response rates were in the range of roughly 6-7%. Our overall aggregate response rate was 3.5%. Differences in response rates by field were corrected by weighting at the disciplinary level (see below). As a further test, we also analyzed response rate by Carnegie Classification. Across the nine Carnegie Classes that we surveyed, response rates varied between 2.8 and 4.2%.

Respondents were asked a variety of demographic questions, some of which are used for segmentation purposes. For example, we regularly analyze responses by the disciplinary groupings of humanities, social sciences, and sciences. These are formulated based on the selections a respondent made to a demographic question regarding his or her discipline or field of study; respondents are able to select as many as they wish, and we aggregate faculty members based on their selections into disciplinary grouping segmentations. In this document, we almost always refer to disciplinary findings exclusively at the level of these disciplinary groupings; we only very rarely refer to findings at an individual disciplinary level. Addressing individual disciplines in a report such as this is challenging due to the large number of disciplines surveyed, and because the individual disciplines that can be analyzed may vary based on the number of responses received to any given question. Our findings do, however, permit this discipline-level analysis in many fields where we received a sufficient number of responses; we would encourage those interested in individual discipline-level findings to consult the underlying data.

Based on self-reported disciplinary affiliations and our traditional grouping rules, our respondent population broke down as follows:³

- Area Studies⁴: 455
- Humanities⁵: 1,753

3 As scholars were able to select multiple disciplines, the sum of these numbers is greater than the overall total number of responses.

4 Area Studies includes: African-American Studies, African Studies, American Studies, Asian Studies, India Studies, Latin American Studies, Middle East Studies, and Slavic Studies (including Russia).

5 Humanities includes: Classical Studies, History (including History of Science), History of Art, Law, Literature, Music, Philosophy, Religion, and Theater and Drama.

- Social Sciences⁶: 1,900
- Sciences⁷: 2,066

The responses we received tended somewhat to over-represent fields in the area studies and humanities and under-represent fields in the social sciences and sciences, in comparison to the prevalence of these fields in the overall MDR population. To address this consideration when we report on faculty member responses in the aggregate (i.e. not by discipline or disciplinary grouping), we weighted responses to bring them into alignment with the overall MDR population. Doing so is consistent with our approach in previous cycles and had relatively minimal impact on response patterns.

In reporting findings below, we have chosen to exclude area studies from comparative analysis of disciplinary groupings because almost all—85%—respondents who self-identified with an area studies discipline also selected a discipline within one of the other disciplinary grouping. In particular, almost two thirds of those who self-identified with an area studies discipline also self-identified with a humanities field. All respondents, including the few who selected only an area studies field, are included in the aggregate response figures.

In this document, we highlight differences between Carnegie Classes for a few key questions on which clear patterns present themselves or where distinctions between institution types seemed particularly important, but we do not report systematically on the institution size differences in responses. Lack of discussion about Carnegie Class distinctions for any given question should not be assumed to indicate that there are no differences between these groups.

We also generally do not discuss response patterns broken down by other demographic information, such as age, gender, or academic rank. We are frequently asked about differences between older and younger faculty, particularly in relation to their use of technology. Although we have not systematically analyzed the impact of age/professorial rank on responses, we have historically seen relatively little difference between older and younger (or senior and less senior) faculty members on most questions relating to use of technology.

Question types

Most of our questions fell into two categories of response types, those that asked respondents to rate something between 1 and 10 or those that asked them how often they do something from among the choices of “never,” “rarely,” “occasionally,” and “often.”

A common type of question posed a strongly worded statement—e.g. “Because faculty have easy access to academic content online, the role librarians play at this institution is becoming much less important”—and asked scholars to rate from

6 Social Sciences includes: Anthropology (includes Archaeology), Business & Finance, Economics, Education (includes Higher Education), Geography, Political Science, Psychology, Public Policy (including Health Policy), Sociology, and Women’s Studies.

7 Sciences includes: Biology (includes Botany, Ecology, Zoology), Chemistry, Computer Science, Engineering, Geology, Mathematics (includes Statistics), Physics, Physical Sciences / Astronomy, and Public Health.

1 to 10 how well each statement describes their point of view, where a 10 equals “extremely well” and a 1 equals “not at all well.” In our reporting here, we have aggregated responses to simplify the presentation of findings; responses of 8, 9, and 10 are grouped together for analysis and characterized as “strongly agreeing” with the statement; responses of 1, 2, and 3 are grouped together for analysis and characterized as “strongly disagreeing” with the statement; and responses of 4, 5, 6, and 7 are grouped together and characterized as relatively neutral responses.

We also often asked scholars other questions with 1-10 answer ranges, such as when we asked them to rate the importance of a given library role from “not at all important” to “extremely important.” Again, we segmented responses as strong negative responses (1-3), neutral responses (4-7), and strong positive responses (8-10). We sometimes asked similar questions on a 1-6 scale, where this is required to track findings over time, and in those cases we segmented responses as strongly negative (1-2), neutral (3-4), and strongly positive (5-6).

In addition, we often asked scholars how often they do something, with answer options of “never,” “rarely,” “occasionally,” and “often.” We typically group the responses of “often” and “occasionally” together, in order to characterize things that are done with some degree of regularity.

In this document, questions are presented as they were presented in the questionnaire itself. There was not additional information presented in the questionnaire that would, for example, define what was meant by specific terms in the questions. We recognize that some terms may be used differently in different fields—for example, what scientists recognize as a “primary source” may be different from what humanists would use that term to describe.

Dataset deposit

Datasets from the 2006 and 2009 cycles of the Faculty Survey have been deposited with ICPSR for long-term preservation and access.⁸ We intend to deposit the 2012 dataset in a similar fashion. Please contact us directly at research@ithaka.org if we can provide any assistance in accessing and working with the underlying data.

Acknowledgments

This project was guided by an advisory committee that helped to establish its thematic priorities, reviewed the questionnaire in draft form, and provided reactions to a draft of this report. The members of this board were:

- D. Russell Bailey, Providence College;
- Al Bertrand, Princeton University Press;
- Peter Dougherty, Princeton University Press;

⁸ Datasets from Ithaka S+R's series of surveys may be found at <http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/226/studies>.

- Linda Downs, College Art Association;
- Brinley Franklin, University of Connecticut;
- Judith Coffey Russell, University of Florida;
- Peggy Seiden, Swarthmore College; and
- Charles Watkinson, Purdue University Press.

We thank them for their tremendous contributions.

In parallel, we have conducted a Survey of Academics focused on UK higher education, and in our effort to align the two projects we also benefitted significantly in the development of the survey questionnaires from the advisory committee for that project, who we thank:

- Mark Brown, University of Southampton
- Rachel Bruce, Jisc
- Wayne Connolly, Newcastle University
- Mike Mertens, Research Libraries UK
- David Prosser, Research Libraries UK
- Ben Showers, Jisc
- Sarah Thomas, University of Oxford

We are grateful to our colleagues who contributed to our work on this project in a variety of ways, including Kevin Guthrie, Marita LaMonica, Matthew Long, Deanna Marcum, Heidi McGregor, Joe Peritz, Jennifer Rutner, Matthew Staiger, Stephen Stigler, and Jeremy Stynes.

The individuals named in this section provided a variety of important substantive contributions to this project, and we thank them for their willingness to help. Final responsibility for the survey and its analysis rests with the authors.

Materials used for research and teaching

The Faculty Survey has historically focused on the role of journals in scholars' activities, as they have been the locus of library decision-making in the print-to-electronic transition. But journals are only one of many formats that scholars use, and understanding their role in the broader context of scholarly materials will be increasingly important to informing decisions by libraries and other resource providers going forward. We have sought to consider how scholarly communications are being reshaped by digital technologies by broadening our focus in this cycle of the survey. In 2012, we have examined how scholars use different types of materials in research and teaching, how the changing digital environ-

ment affects the ways that they find and gain access to those materials, how they perceive library collections in this changing environment, and how they ask students to engage with these materials.

Types of materials used in research

It is firmly established in the literature that “the peer-reviewed journal article is the primary mode of scholarly dissemination in the sciences and quantitative social sciences, while the more interpretive, historical, and qualitative disciplines rely heavily on the university press monograph with a varying mix of journal articles, critical editions, and other publications.”⁹ Our findings support this perspective; respondents rated traditional formats of scholarly communication highly in comparison to other material types (see Figure 1). Virtually all respondents indicated that peer reviewed journals and journal articles are very important in their research, and about two-thirds of respondents indicated that scholarly monographs or edited volumes published by an academic publisher were also very important. A significantly greater share of humanists and area studies faculty members rated monographs highly than did scholars in other fields, but the monograph rated highly across disciplines.

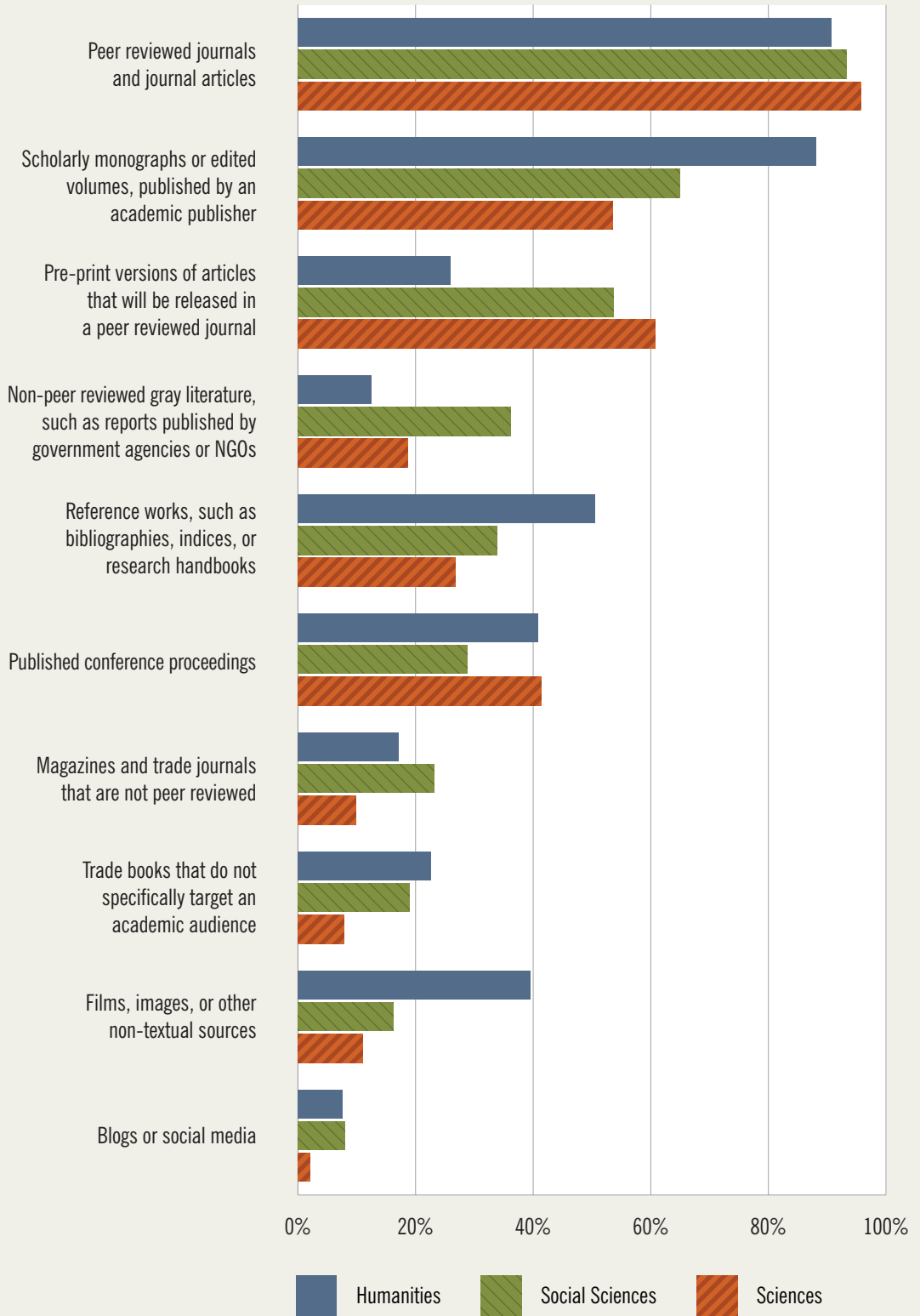
In recent years, there has been significant community discussion about how technology allows scholars to share research findings directly with their peers in a variety of ways. Researchers in many fields have a long history of sharing pre-print versions of articles in order to communicate research findings more rapidly, with pre-print versions serving as a complement to the eventual published version. Repositories such as arXiv, which initially focused on high-energy physics and now encompasses a variety of related scientific fields, or the Social Science Research Network, have become important venues for sharing these materials on a large scale, in addition to versions provided by individual scholars through an institutional repository or personal home page. About half of our respondents indicated that these materials—pre-print versions of materials that will be released in a peer-reviewed journal¹⁰—are very important to their research. But responses also indicated that the importance of these materials varied substantially by discipline, with much greater interest among scientists and social scientists (of whom about 60% rated pre-prints as very important) than among humanists (where roughly 30% shared this perspective).

9 Diane Harley, Sophia Krzys Acord, Sarah Earl-Novell, Shannon Lawrence, and C. Judson King, *Assessing the Future Landscape of Scholarly Communication: An Exploration of Faculty Values and Needs in Seven Disciplines* (UC Berkeley: Center for Studies in Higher Education, 2010), i. <http://escholarship.org/uc/item/15x7385g>; see also Tony Becher and Paul Trowler, *Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Discipline* (Open University Press: November, 2011).

10 This question may conflate pre-prints with a broader range of materials made freely available online. In future versions of the survey, we may explore if faculty differentiate between different types of materials made freely available online—pre-prints versus versions of articles made freely available by the author or by a third party—or if these are roughly interchangeable in the eyes of faculty.

FIGURE 1

“Scholars draw on a variety of scholarly materials in their research. How important to your research is each of the following types of materials?” Percent of respondents who indicated that each of these materials is very important in their research, by disciplinary grouping.



In addition to the formal scholarly literature (and pre-print versions thereof), we explored the importance of a variety of other types of materials—principally secondary sources—that scholars may use in their research. In general, these other materials types were less widely regarded as important, although certain materials were valued more highly in particular fields:

- “Published conference proceedings,” another traditional format for communicating scholarship, were rated as very important by slightly less than 40% of respondents, with a smaller share of social scientists than scientists or humanists rating these as very important.
- “Reference works, such as bibliographies, indices, or research handbooks” were also rated as very important by about 40% of respondents, although with greater disciplinary variation—about half of humanists rated reference works as very important, while only a third of social scientists and a quarter of scientists did so.
- “Non-peer reviewed ‘gray literature,’ such as reports published by government agencies or NGOs” was rated as very important by only about a quarter of respondents, although a notably larger share of social scientists than scholars in other fields rated gray literature as very important.
- Materials that target a general audience, including “magazines and trade journals that are not peer reviewed,” “trade books that do not specifically target an academic audience,” and “films, images, and other non-textual materials,” were only rated as very important by about one in five respondents. More humanists and area studies faculty members rated non-textual media highly, and scientists were generally the least interested in these categories.
- Although many scholars reported using pre-print versions of materials, other less formal methods for sharing information online are not as well-regarded. “Blogs or social media”¹¹ were rated as very important by a very small share of respondents, with a substantial majority of faculty members indicating that they view these as not important to their research.

Types of materials used in teaching

Although journals and monographs are paramount in importance for research, scholars relied less heavily on these two material types in their teaching (see Figure 2 and Figure 3). Instead, scholars rely most heavily on a tool specifically designed for student use: the textbook. In lower division (first and second year) courses, 9 out of 10 respondents often or occasionally assign their students to read textbooks, and the number is only marginally lower in upper division (third and fourth year) courses. Textbooks are somewhat less commonly used in the humanities than in the social sciences and sciences, although still used often by a solid majority.

11 Although not defined more precisely in the survey, this could refer to either mainstream tools like Facebook and Twitter or services specifically for the academy like MLA Commons. In the future, we may seek to differentiate between these types of tools and services.

FIGURE 2

“How often do you assign your students in a lower division undergraduate course to read or otherwise engage with each of the following types of materials in preparation for a class?” Percent of respondents who indicated that they “often” or “occasionally” assign these materials, by disciplinary grouping.

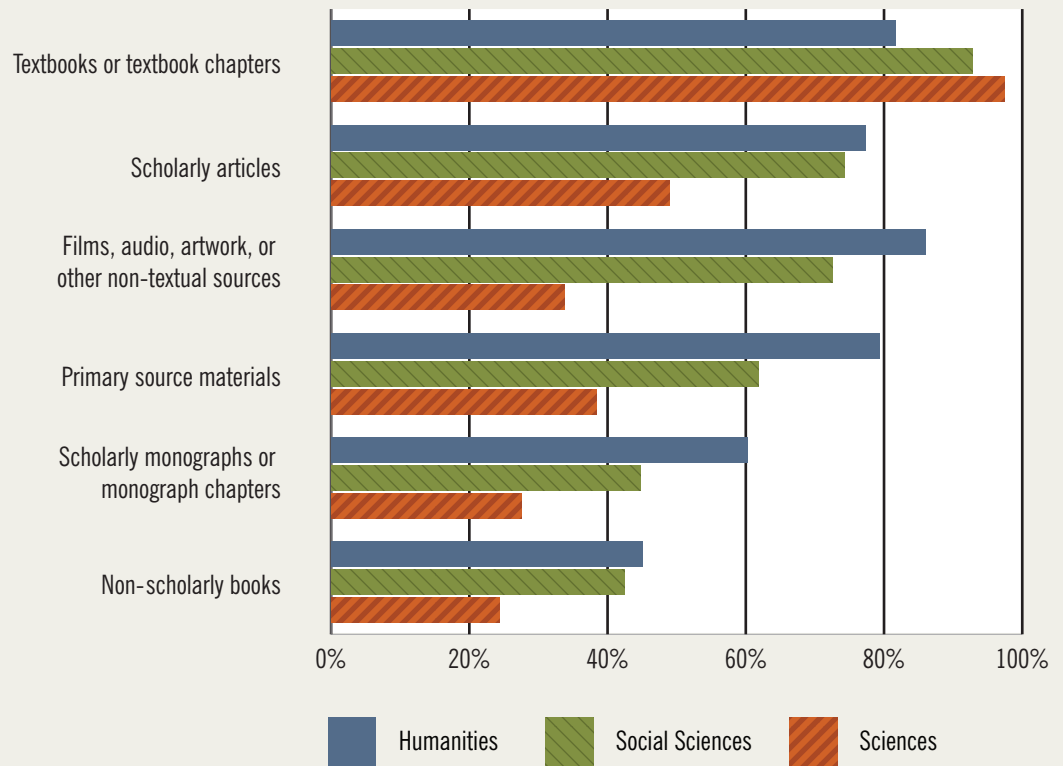
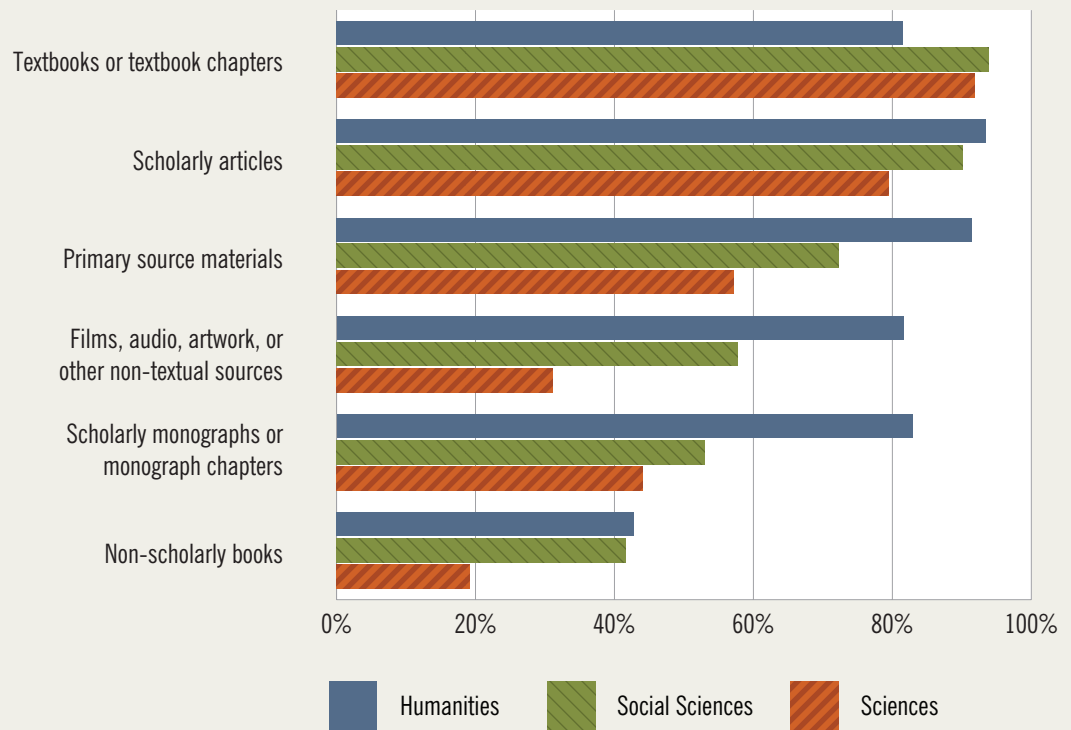


FIGURE 3

“How often do you assign your students in an upper division undergraduate course to read or otherwise engage with each of the following types of materials in preparation for a class? Percent of respondents who indicated that they “often” or “occasionally” assign these materials, by disciplinary grouping.



Although journal articles and monographs are less widely used than textbooks, a significant share of respondents indicated they assigned their students to read either of these formats (including both entire monographs and individual chapters). A significantly larger share of respondents reported assigning these materials to their upper division courses than to their lower division courses. About two-thirds of respondents reported assigning scholarly articles in their lower division courses, while almost 9 out of 10 reported doing so in upper level courses. A smaller share—only about 40%—reported assigning monographs or monograph chapters in lower division courses, with slightly over half reporting that they assign these material types in their upper level courses. There is a strong disciplinary pattern; a notably smaller share of scientists assigned either journal articles or monographs to their upper and lower division students; undergraduate teaching in the sciences is substantially more driven by textbooks than by scholarly materials.

In recent years there has been great interest—even beyond the academic community—in how students are using primary sources in the classroom.¹² Many respondents indicated that they do in fact use primary source materials in their teaching, with roughly two-thirds of respondents—slightly more in the case of upper division courses, and slightly less in the case of lower division courses—indicating that they assign their students to engage with primary source materials in their courses. These responses also differed by discipline; a substantially smaller share of scientists reported that they assign primary source materials than either humanists or social scientists. A similar pattern can be seen for films, audio, artwork, and other non-textual materials, with these materials commonly assigned in both upper and lower division classes, particularly in the humanities and (to a lesser degree) the social sciences. These materials are much less commonly assigned, at either level, by scientists.

Discovery

While a wide array of primary and secondary scholarly resources remain important to scholars in their research and teaching, the ways that they find these materials have evolved substantially as an increasing share are made available digitally. Libraries have continued to offer a growing variety of tools to support scholars in navigating the scholarly literature, including long-established tools like the library catalog and infrastructure to support linking to and between needed materials. Recently, many libraries have invested heavily in indexed discovery services, tools that provide single search box interfaces to explore a range of different types of library collections.¹³ In addition to library-provided infrastructure, mainstream search engines such as Google and Bing, targeted academic discovery products by mainstream search providers (tools

12 Roger Mummert, “Handle This Book!” *New York Times*, October 30, 2008, <http://www.nytimes.com/2008/11/02/education/edlife/rarebks.html>.

13 Judy Luther and Maureen C. Kelly, “The Next Generation of Discovery,” *Library Journal*, March 1, 2011, http://www.libraryjournal.com/lj/home/889250-264/the_next_generation_of_discovery.html.csp; Michael Kelley, “Stakeholders Strive to Define Standards for Web-Scale Discovery Systems,” *Library Journal*, October 11, 2012, <http://www.thedigitalshift.com/2012/10/discovery/coming-into-focus-web-scale-discovery-services-face-growing-need-for-best-practices/>.

like Google Scholar or Microsoft Academic Search),¹⁴ and a host of products and services from inside and outside of the academy¹⁵ provide their own particular approach to supporting discovery of scholarly resources.

One of our longest-running questions in the Ithaka S+R Faculty Survey asks respondents to tell us where they begin their research (see Figure 4 and Figure 5). Over time, we have seen a clear trend away from respondents reporting that they begin their research at the library itself—in either its physical or digital instantiation—and towards beginning at either scholarly or general purpose online resources. But the 2012 cycle of the survey showed a slight break in this trend as the share that reported starting at the library catalog grew slightly and the share that reported starting at a specific electronic research resource or computer database declined slightly, although the overall pattern remained the same. This trend was driven principally by changing behaviors among humanists, who appear to be shifting slightly back towards greater reliance on the catalog, with smaller change or none at all in other fields. This may be the result of libraries' efforts to rethink the nature of search available through their homepages via larger-scale indexed discovery services.

This year we also introduced a set of similar but slightly more focused questions, which asked respondents to consider where they begin their research processes in two specific scenarios: first, in trying to locate a specific piece of secondary scholarly literature that they already know about but do not have in hand (“known item searches”); and second, when exploring the scholarly literature to find new journal articles and monographs relevant to their research interests. For known item searches the largest share of faculty members (about 40%) indicated they would begin at their library website, with about 30% indicating a preference for starting at a specific scholarly database or search engine and 20% starting with a general purpose search engine (see Figure 6). When “explor[ing] the scholarly literature,” the most popular category of starting point is the specific scholarly database or search engine, with smaller shares preferring the other venues (see Figure 6). In either case, only a very small share indicated that they would turn to a librarian, a colleague, or another resource.

These overall numbers mask significant disciplinary differences. For known item searches, almost twice as many humanists as scientists start at the library website, while twice as many scientists as humanists start at a specific scholarly database or search engine. For exploring the scholarly literature, a much larger share of humanists than scientists again start at the library website, with a somewhat smaller but still pronounced pattern of scientists more often starting at specific scholarly databases. Perhaps because of the different types of materials that they use, scientists and humanists utilize very different infrastructure for discovery of needed materials.

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- 14 Andrew D. Asher, Lynda M. Duke, and Suzanne Wilson, “Paths of Discovery: Comparing the Search effectiveness of EBSCO Discovery Service, Summon, Google Scholar, and Conventional Library Resources,” *College & Research Libraries*, anticipated publication date: July, 2013), <http://crl.acrl.org/content/early/2012/05/07/crl-374.abstract>.
- 15 V. Henning and J. Reichelt, “Mendeley - A Last.fm for Research?” Paper presented at the Fourth International Conference on eScience (December 7-12, 2008).

FIGURE 4

“Below are four possible starting points for research in academic literature. Typically, when you are conducting academic research, which of these four starting points do you use to begin locating information for you research?” Percent of respondents who indicated that each option is the starting point for their research, over time.

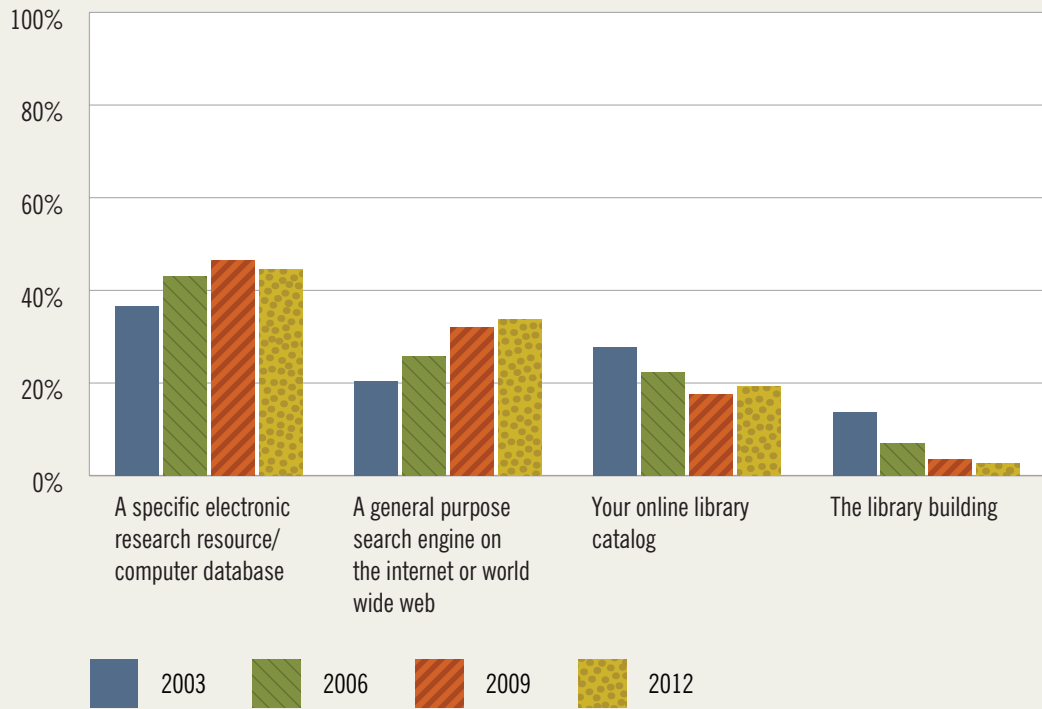


FIGURE 5

“Below are four possible starting points for research in academic literature. Typically, when you are conducting academic research, which of these four starting points do you use to begin locating information for your research?”
Percent of respondents who indicated that each option is the starting point for their research, by disciplinary grouping.

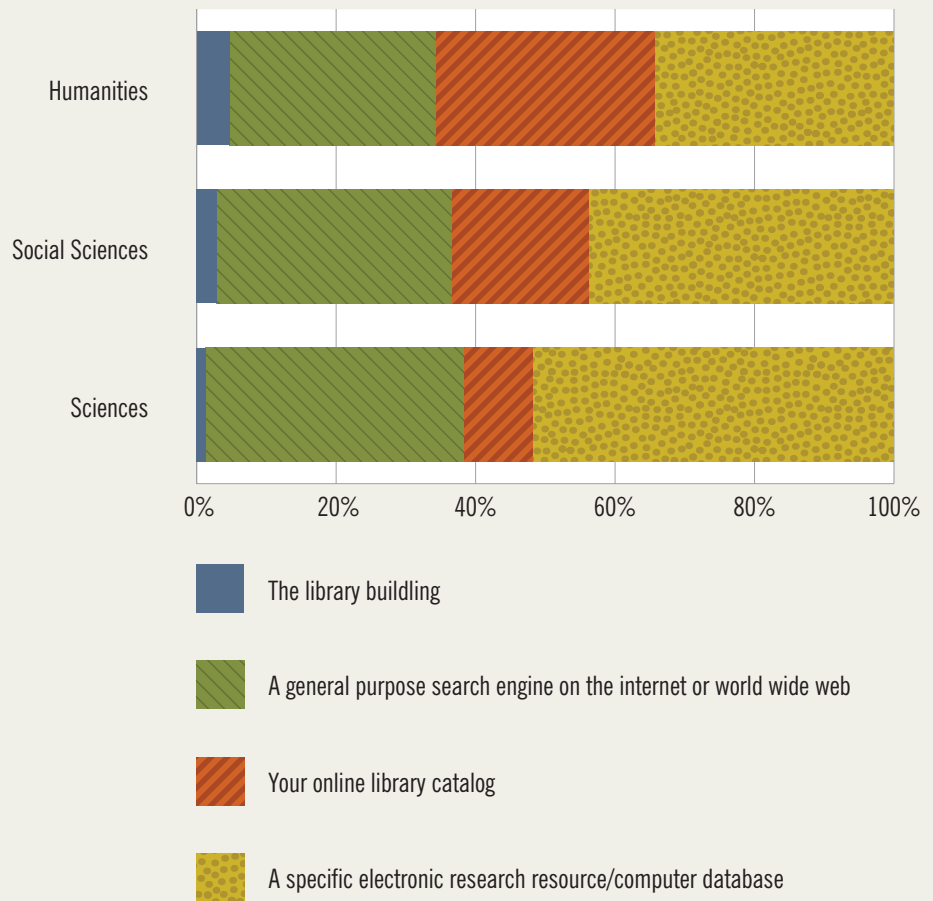
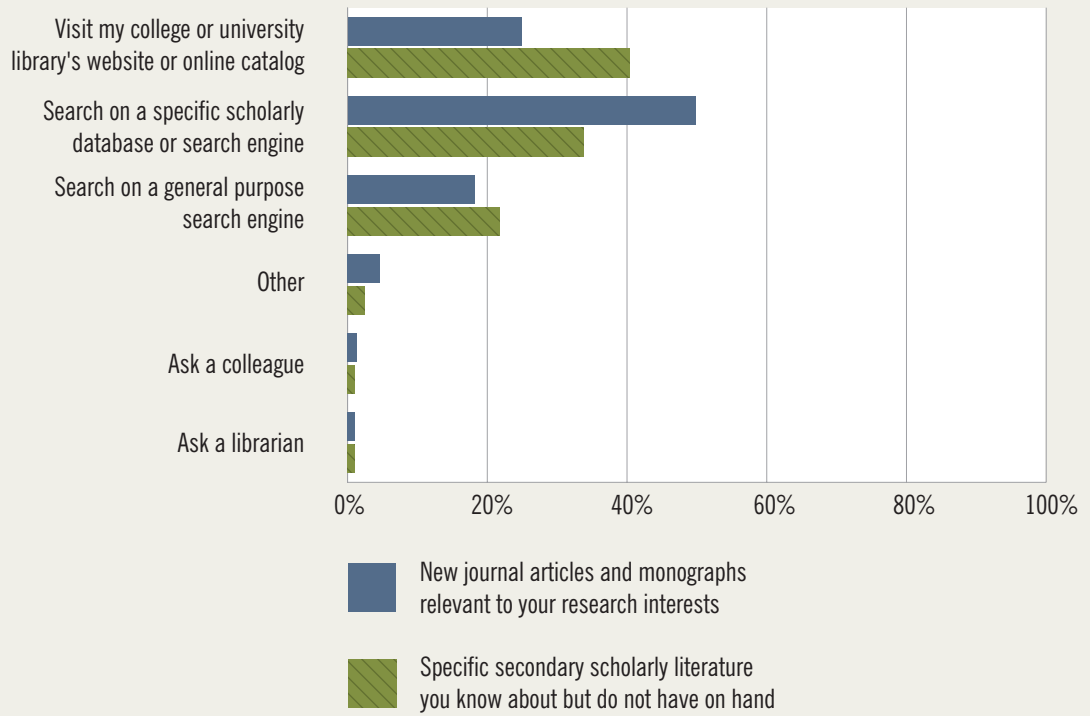


FIGURE 6

“When you try to locate a specific piece of secondary scholarly literature that you already know about but do not have in hand, how do you most often begin your process?” and “When you explore the scholarly literature to find new journal articles and monographs relevant to your research interests, how do you most often begin your process?” Percent of respondents who indicated that they begin their research process with each of the following resources.

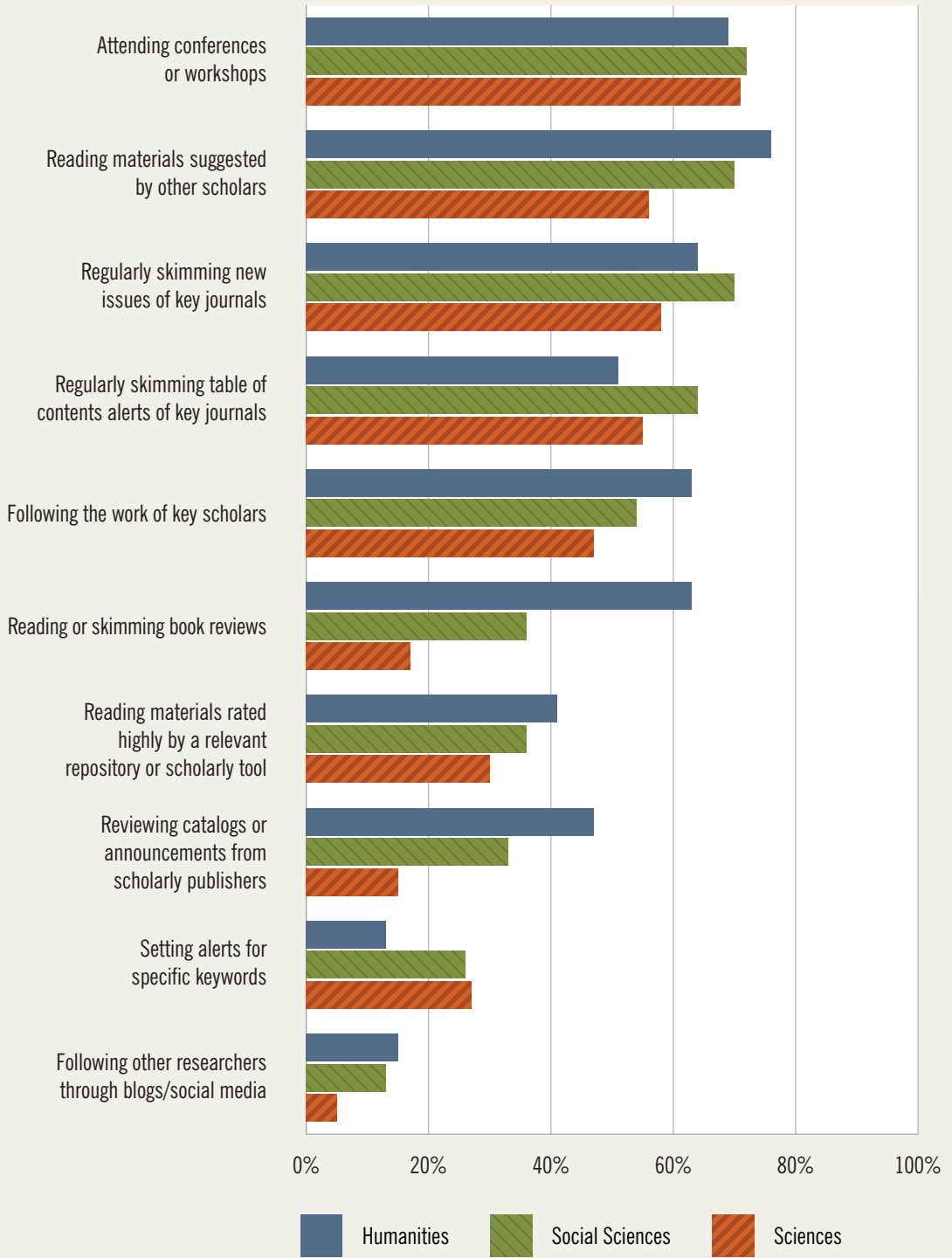


While these questions explore where scholars begin their process of looking for needed materials, they may go well beyond these starting points in the course of their research. Our respondents clearly indicated that they do not rely exclusively on any particular avenue for discovering needed materials; four out of five faculty respondents strongly agreed that “when I am looking for journal articles and monographs in the course of my research, I often use a variety of different sources, including the library, scholarly databases, and mainstream search engines.” The share of scientists and social scientists who strongly agreed with this statement was slightly smaller than the share of humanists. Their other responses reinforce the idea that researchers discover needed materials in a variety of ways, and that they pursue different strategies in specific circumstances or for a given set of needs.

We recognize that scholars keep up with their fields in a variety of ways that go well beyond the process of searching for scholarly literature. In response to a question about tactics for “keeping up” with current scholarship in one’s field (see Figure 7), respondents favored tried and true methods. To be precise, they keep up through interactions with a variety of people (both their immediate peers and important figures in their field) and key published materials (journals and, in the case of humanities and area studies scholars, books). All of the responses that were rated as very important by a majority of respondents involved either engaging with peers—attending conferences, reading materials suggested by their peers, following the work of key scholars—or tracking key journals by either skimming new issues or receiving alerts about their tables of contents. Some other approaches differ substantially by discipline; for example, reading book reviews and reviewing catalogs or announcements are very important approach for keeping up among humanists and area studies faculty, but substantially less important for social scientists and scientists.

FIGURE 7

“You may employ a variety of different tactics to ‘keep up’ with current scholarship in your field on a regular basis. Please use the scales below to rate...how important each of the following methods is for staying current with new scholarship in your field.” Percent of respondents who indicated that each of these “tactics” is very important for keeping up with scholarship in their field, by disciplinary grouping.



Provisioning materials to faculty members: formats and sources

Once they discover an item that they want, faculty members have long-held preferences for how they wish to gain access to research materials. The Ithaka S+R Faculty Survey has examined how scholars' relationships with scholarly materials are changing as these materials are increasingly made available digitally. Historically, this investigation was principally focused on understanding how scholars worked with print and digital versions of scholarly journals, and the implications of these changing patterns on library collections. This reflected a long-standing library community interest in changing the ways in which print journal collections are managed at libraries. As libraries have increasingly seen their physical journal collections go unused in favor of digital versions, many have sought to repurpose space and resources away from collecting and maintaining collections of print journals in favor of other activities that are seen to offer greater value. At the same time, research libraries are increasing spending on digital materials, after several years of decreased spending.¹⁶

The print-to-electronic format transition: current issues of scholarly journals

Many libraries have moved towards providing e-only access for current issues of at least some journals, reflecting a substantial decline in usage of current journal issues in print format.¹⁷ This notion seems relatively uncontroversial in the sciences and social sciences in particular. A solid majority of respondents continued to strongly agree that it would be “fine with me” if their library were to cancel print subscriptions in favor of e-only access for journals (see Figure 8). But while these numbers remained high, the trend of increasing agreement with this statement over time did not continue in the 2012 cycle of the survey. In fact, slightly smaller shares of respondents agreed strongly with this statement in 2012 than had in 2009. Time will tell if this is a fluctuation or the beginning of greater concern among scholars about the move towards digital current issues.

In addition to asking faculty to consider their library's collecting of print current issues of scholarly journals, we also asked them to rate their level of agreement with the statement “I would be completely comfortable with journals I use regularly ceasing their print versions and publishing in electronic-only form” (see Figure 9). Overall, the share of respondents who agreed strongly with this statement grew substantially in this cycle of the survey. While the share of respondents who indicated they would be comfortable with journals publishing current issues in e-only format remains smaller than the share who indicated they would be comfortable with their libraries collecting only electronic versions of current issues, the trendlines suggest that two may be converging.

16 Alisha Azevedo, “Research Libraries Increase Spending on Digital Materials.” *The Chronicle of Higher Education*, <http://chronicle.com/article/Research-Libraries-Increase/134862/>.

17 Richard K. Johnson and Judy Luther, “The E-only Tipping Point for Journals: What's Ahead in the Print-to-Electronic Transition Zone,” *Association of Research Libraries* (2007), http://www.arl.org/bm~doc/electronic_transition.pdf.

FIGURE 8

"If my library cancelled the current issues of a print version of a journal but continued to make them available electronically, that would be fine with me." Percent of respondents strongly agreeing, by disciplinary grouping

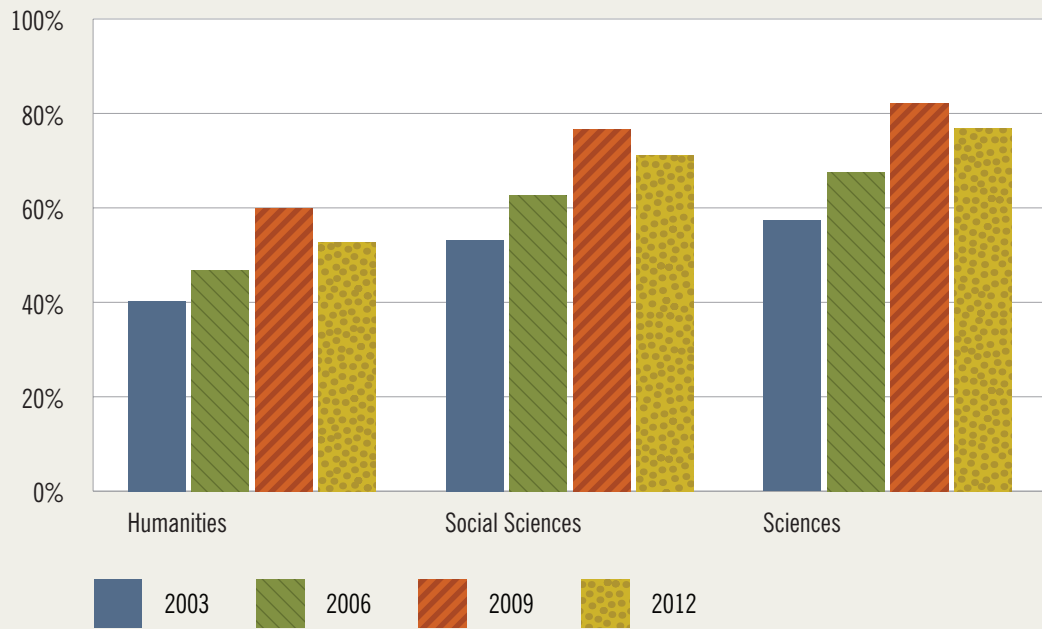
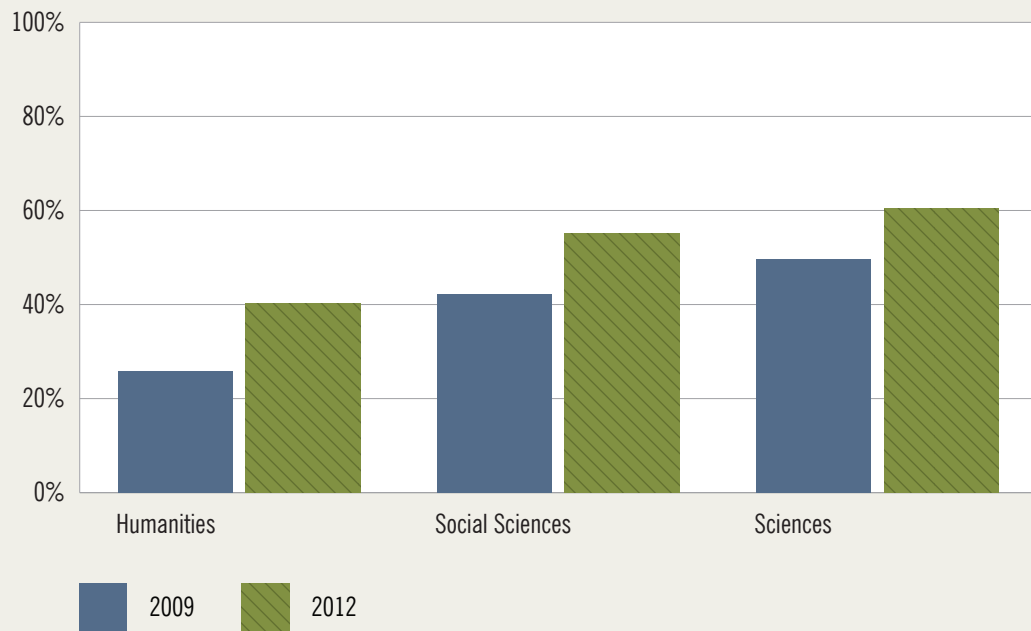


FIGURE 9

"I am completely comfortable with journals I use regularly ceasing their print versions and publishing in electronic-only form." Percent of respondents strongly agreeing, by disciplinary grouping and over time.



The print-to-electronic format transition: existing collections of scholarly journals

In addition to moving away from current issue subscriptions of print journals in favor of e-only access, some libraries have also begun to explore collaborative ways to maintain journal collections. These collaborations enable individual libraries to remove large shares of their local collections in favor of shared collections that are either held centrally or distributed across a set of partner institutions. There are a few examples of regional efforts like the Western Regional Storage Trust (WEST).¹⁸ Ithaka S+R's What to Withdraw¹⁹ report sought to establish community preservation targets for journal materials in order to help ensure that libraries meet their shared preservation goals. But while there is substantial momentum in the library community around the large-scale local deaccessioning of print journals, this process has at times raised some concerns among scholars and students.²⁰

Still, attitudes may be changing. The share of respondents who agreed strongly with the statement “assuming that electronic collections of journals are proven to work well, I would be happy to see hard copy collections discarded and replaced entirely by electronic collections” continued to increase in this cycle of the survey (see Figure 10). In the aggregate, about 40% of faculty members agreed strongly with this statement, while about half of respondents in the sciences and social sciences agreed strongly.

In a question about long-term perspective, the share of respondents that strongly agreed that it will always be crucial for either “my college or university library” or “some college or university libraries” to maintain hard-copy collections of journals, “regardless of how reliable and safe electronic collections of journals may be,” has continued to decline. A majority continued to strongly agree that this will be crucial for some libraries (see Figure 11), and it appears that the share of respondents that strongly agrees with this notion may be reaching a plateau on a disciplinary level. But the share that believes it will always be crucial for their library to maintain these collections has declined slightly, to less than a third, and in the sciences, to less than a quarter (see Figure 12).

18 Western Regional Storage Trust (WEST), <http://www.cdlib.org/west/>.

19 Roger C. Schonfeld and Ross Housewright, “What to Withdraw: Print Collections Management in the Wake of Digitization,” A Report by Ithaka S+R (September, 2009), <http://www.sr.ithaka.org/research-publications/what-withdraw-print-collections-management-wake-digitization>.

20 Jennifer Epstein, “A Win for the Stacks,” Inside Higher Ed, November 13, 2009, <http://www.insidehighered.com/news/2009/11/13/syracuse>; “How Many Copies is Enough? Too Many?: Libraries and Shared Monograph Archives,” A Session at the MLA Annual Convention (January, 2013), <http://mlalibraries.wordpress.com/mla-2013/>.

FIGURE 10

“Assuming that electronic collections of journals are proven to work well, I would be happy to see hard copy collections discarded and replaced entirely by electronic collections.” Percent of respondents strongly agreeing, by disciplinary grouping and over time.

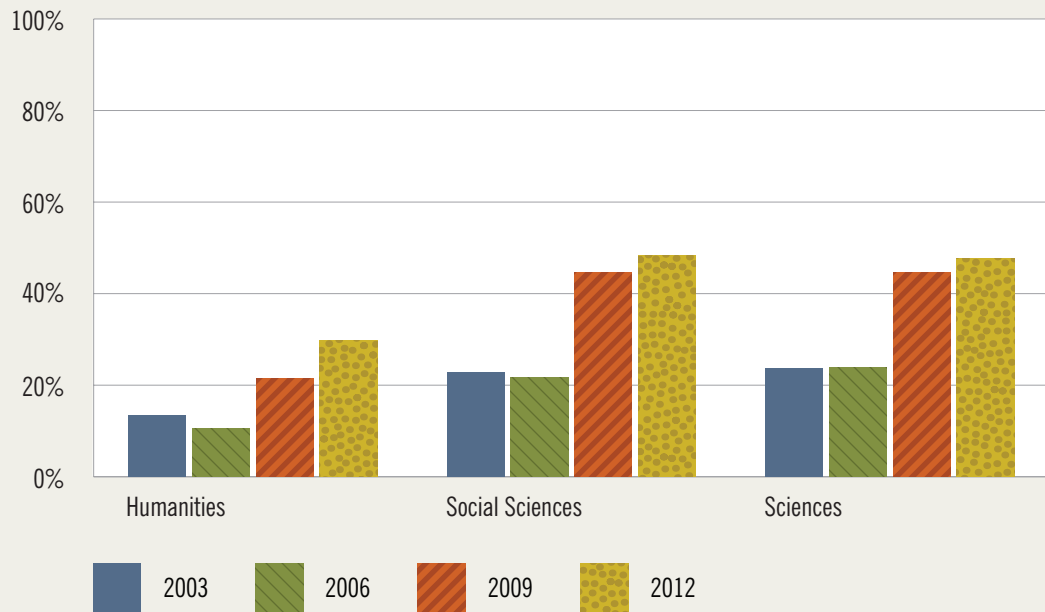


FIGURE 11

“Regardless of how reliable and safe electronic collections of journals may be, it will always be crucial for some libraries to maintain hard-copy collections of journals.” Percent of respondents strongly agreeing, by disciplinary grouping and over time.

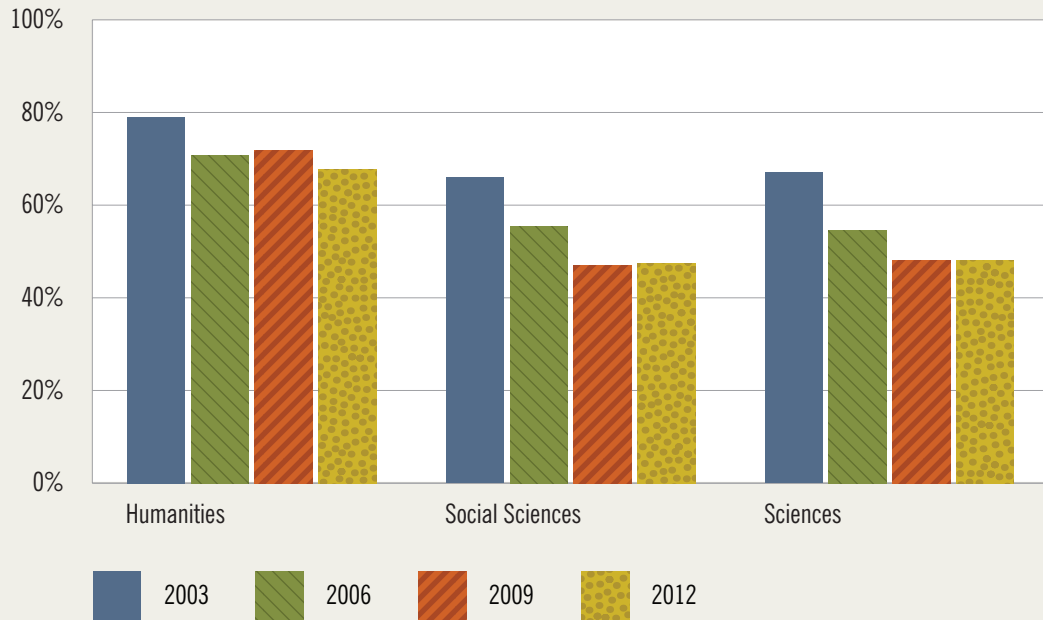
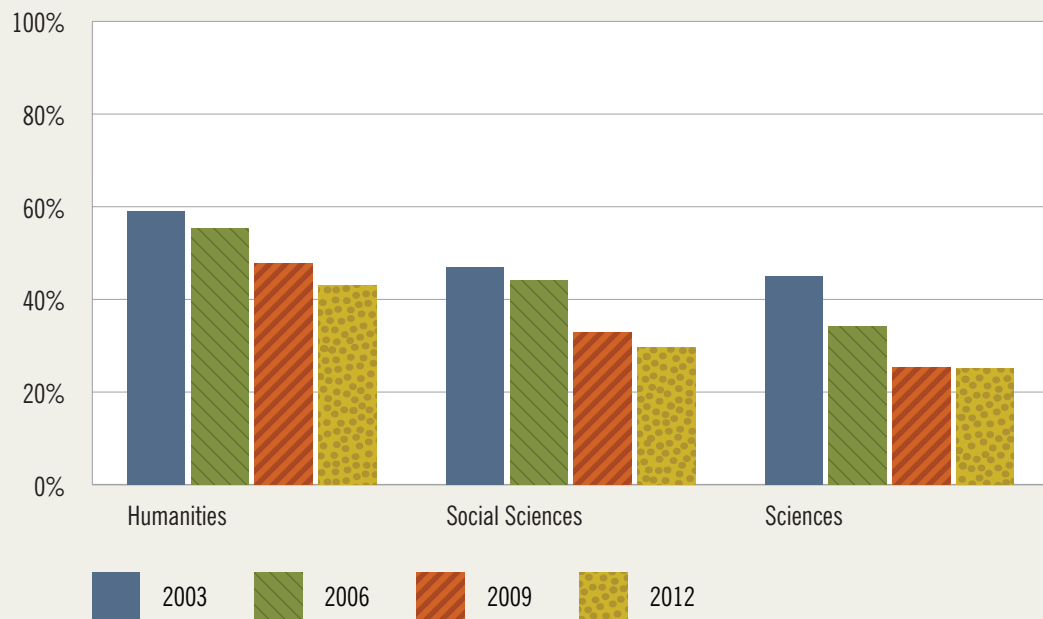


FIGURE 12

“Regardless of how reliable and safe electronic collections of journals may be, it will always be crucial for my college or university library to maintain hard-copy collections of journals.” Percent of respondents agreeing strongly, by disciplinary grouping and over time.

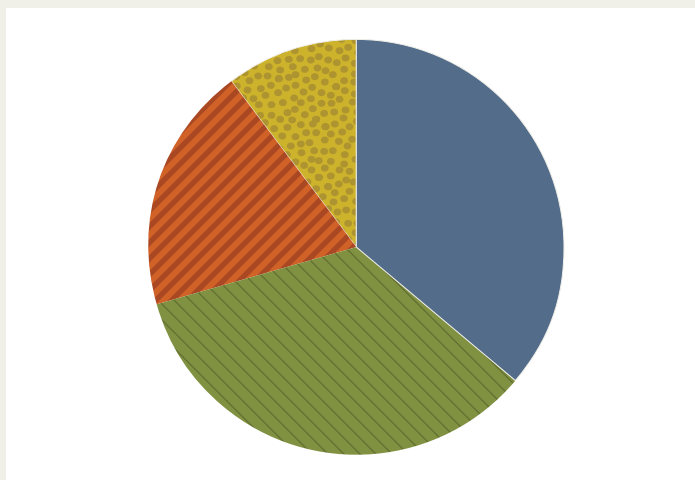


A print-to-electronic format transition for scholarly monographs?

After many years in which e-books were seen as the “next big thing,” they are firmly established in the mainstream marketplace and they are increasingly common among scholarly materials as well. Academic library directors have expressed an intention to spend increasing shares of their books budgets on electronic versions,²¹ although the marketplace for these materials remains in flux as new product offerings are developed and publishing industry standards are created.²² Scholars are increasingly able to access many materials through mass digitization projects like Google Books, consumer-facing services like Amazon’s Kindle or Apple’s iBooks, or library licensed ebook collections. Scholars are engaging with scholarly monographs in digital format, as 70% of faculty respondents indicated that they have “often” or “occasionally” used scholarly monographs in electronic format in the past six months (see Figure 13), and only about 10% indicated that they have not done so at all, with little variation between disciplines. In addition, a majority of respondents strongly agreed with the statement that “electronic versions of scholarly monographs play a very important role in my research and teaching.”

FIGURE 13

"You may have the opportunity to read scholarly monographs in electronic format, either through a library subscription database or as standalone e-books. How often have you used scholarly monographs in digital form in the past six months - often, occasionally, rarely, or never?" Responses from all respondents



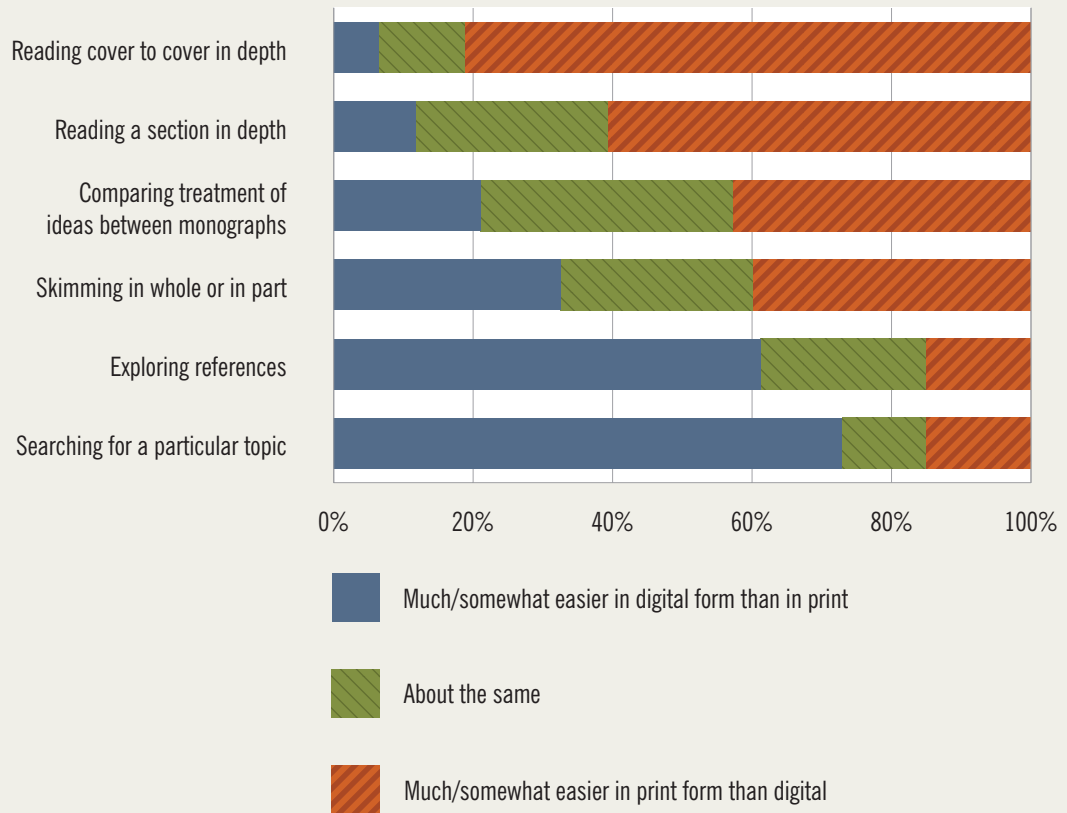
Whereas for many scholarly journal articles, the digital version can be said to have supplanted the print entirely, scholars indicate that electronic versions of scholarly monographs are better suited to some uses than to others (see Fig-

21 Matthew P. Long and Roger C. Schonfeld, *Library Survey 2010: Insights from U.S. Academic Library Directors* (New York: Ithaka S+R, 2011), available at <http://www.sr.ithaka.org/research-publications/library-survey-2010>, 28-29.

22 See for example the “Beyond Print” project at Duke University’s Triangle Research Libraries Network, <http://www.trln.org/BeyondPrint/>.

FIGURE 14

“Below is a list of ways you may use a scholarly monograph. Please think about doing each of these things with a scholarly monograph in print format or in digital format, and . . . indicate how much easier or harder is it to perform each activity in print or digital format.” Percent of respondents who indicated that each of these practices is either easier, harder, or about the same in print or digital formats.

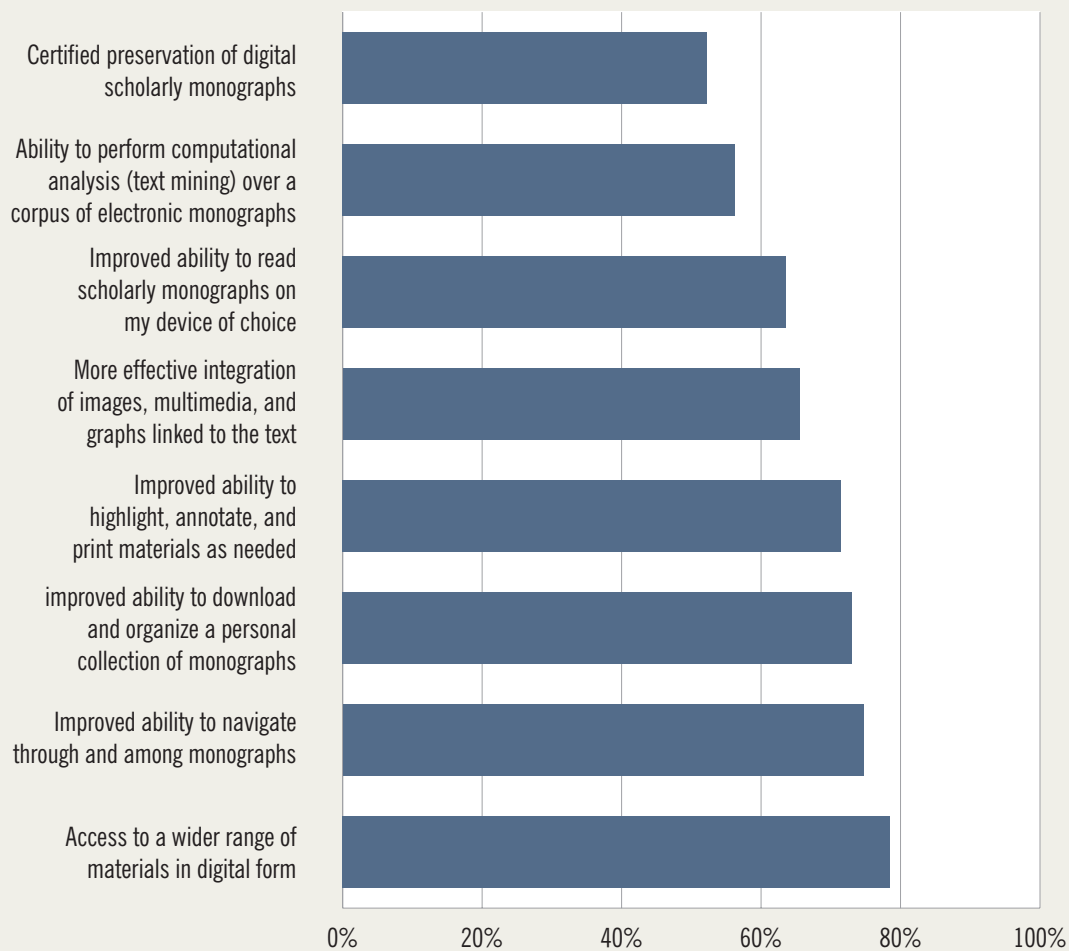


ure 14). We asked faculty members to rate a variety of common activities on a continuum between “much easier in print form than in digital” and “much easier in digital form than in print.” A majority of respondents indicated that reading cover-to-cover and reading a section in depth are activities that are either “much easier” or “somewhat easier” in print format than in digital format, while a majority indicated that searching for a particular topic and exploring references are either “much” or “somewhat” easier in digital format than in print format. On the activity of comparing treatments of ideas among monographs, the largest share of respondents said this was about the same between formats, but the share that rated this activity as easier in digital form was much smaller than the share that rated it as easier in print form.

While responses did tilt the scale towards electronic versions of scholarly monographs for some activities, they also indicated a number of areas of improvement that would make digital versions of scholarly monographs much more valuable than they are today (see Figure 15).

FIGURE 15

“You may have the opportunity to read scholarly monographs in electronic format, either through a library subscription database or as a standalone e-book. Certain changes in the future may make digital versions more valuable to you. [...]Rate how much more valuable each of the following would make digital versions of scholarly monographs to you than they are today.” Percent of respondents who indicated that each of these changes would make digital monographs much more valuable.

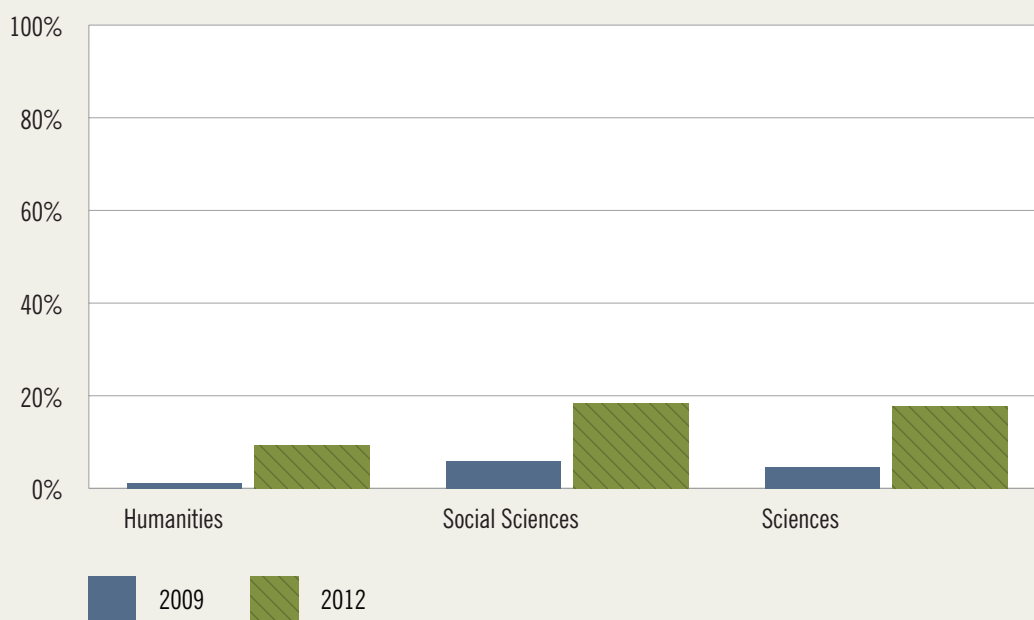


The improvement rated highly by the largest share of faculty was, simply, access to more monographs in digital form. Several potential functional improvements, including an improved ability to navigate through and among monographs; to download and organize a personal collection; to highlight, annotate, and print as needed; to read on a device of choice; and to more effectively integrate images and multimedia, were rated as very valuable by solid majorities of respondents. This indicates that there are many opportunities for digital books to be made more usable. Even the features that were rated highly by the smallest shares of respondents—better ability to perform text mining, and certified digital preservation—still garnered a majority of favorable responses. Reformulating this question module to force respondents to rank options or consider tradeoffs might have yielded a stronger result.

Even while digital versions of scholarly monographs remain a relatively new feature on the mainstream scholarly communications landscape, some libraries have already begun to consider how library collections of print books will evolve, following the example of library journal collections. Very few respondents have historically agreed strongly with the statement: “Within the next five years, the use of e-books will be so prevalent among faculty and students that it will not be necessary to maintain library collections of hard copy books” (see Figure 16). This overall pattern did not change in this cycle of the survey; the share of faculty members who strongly agree remained relatively small, but it did grow sharply since the last survey. In the aggregate, about 16% of respondents agreed strongly, up from about 4% in the 2009 iteration of the survey. When library directors were asked this same question in the Ithaca S+R Library Survey 2010, only about 7% strongly agreed with this statement; the next cycle of the Library Survey will help illuminate if faculty and library leadership attitudes on this concept are keeping pace with each other.²³

FIGURE 16

“Within the next five years, the use of e-books will be so prevalent among faculty and students that it will not be necessary to maintain library collections of hard-copy books.” Percent of respondents agreeing strongly, by disciplinary grouping and over time.



23 For another recent survey of ebook perceptions, focusing on Wellesley College, see Deborah Lenares, “eBook Use and Acceptance in an Undergraduate Institution” (New York: Springer, 2013).

Gaining access to materials for use in research

It has long been understood that no library, no matter how well resourced, can supply all of the materials scholars may require for their teaching and research activities through their local collections. Recognizing this, the library community has developed robust networks for inter-library lending and document delivery of needed resources, enabling scholars to easily gain access to materials not available through a local print collection or digital subscription. As mentioned above, many libraries are considering more radical collaborative approaches to maintaining shared print collections, and in many cases new digital models such as patron-driven access make the distinction between the materials that are and are not “in” a library’s collections relatively immaterial.²⁴

Our respondents demonstrated that while their library’s own collections and library-facilitated inter-library lending are critically important to their research and teaching, they move fluidly among a variety of approaches and sources in order to gain access to the materials they need. The campus library is a central element, but it is only one part of a complex environment for accessing needed scholarly resources. About a quarter of respondents indicated that they found it “very frustrating” to have to use a variety of tools and databases to find and gain access to needed scholarly materials, but they are relatively comfortable with and successful in implementing a variety of tactics to reach the materials they need.

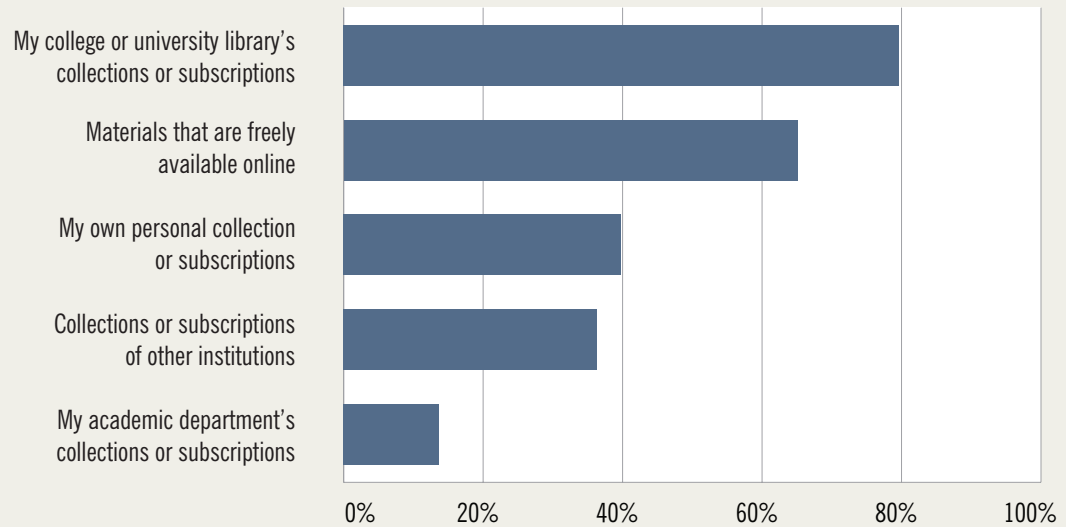
A large share of our respondents (80%), with only moderate disciplinary variation, indicated that their own college or university library is a very important source of journal articles and scholarly monographs for research and teaching, and only a very small share of faculty members indicated that these collections and subscriptions are not important sources for them (see Figure 17). At least in the case of journal collections, about half of all faculty respondents—slightly more in the humanities than in the sciences or social sciences—strongly agreed that “I often would like to use journal articles that are not in my library’s print or digital collections.” The share of scholars agreeing strongly with this statement was slightly smaller at institutions in the Carnegie Class of “Research Universities (very high research activities)” than at other institution types. However, respondents also indicated that they pursue a variety of other approaches to satisfying their resource needs, and about 60% of faculty members agreed strongly with a statement (again, specifically regarding journal collections) that they can “almost always get satisfactory access” to needed articles elsewhere.

There are some differences in the sources that scholars at different Carnegie Class institutions find important in their research and teaching, presumably reflecting the broader range of resources that larger institutions are able to offer. Slightly larger shares of scholars at research institutions rated their own institution’s library collections or subscriptions as very important to their research and teaching than did scholars at other types of institutions, while a slightly smaller share of scholars at the very largest research institutions rated other institutions’ libraries collections or subscriptions as very important to their teaching and research.

24 Steve Kolowich, “Affection for PDA,” *Inside Higher Ed*, June 20, 2012, <http://www.insidehighered.com/news/2012/06/20/research-foresees-demand-driven-book-acquisition-replacing-librarians-discretion>.

FIGURE 17

“When you think about the journal articles and scholarly monographs that you routinely use – for research as well as for teaching – how important are each of the following sources?” Percent of respondents who indicated that each of the following is a very important source for journal articles and scholarly monographs.



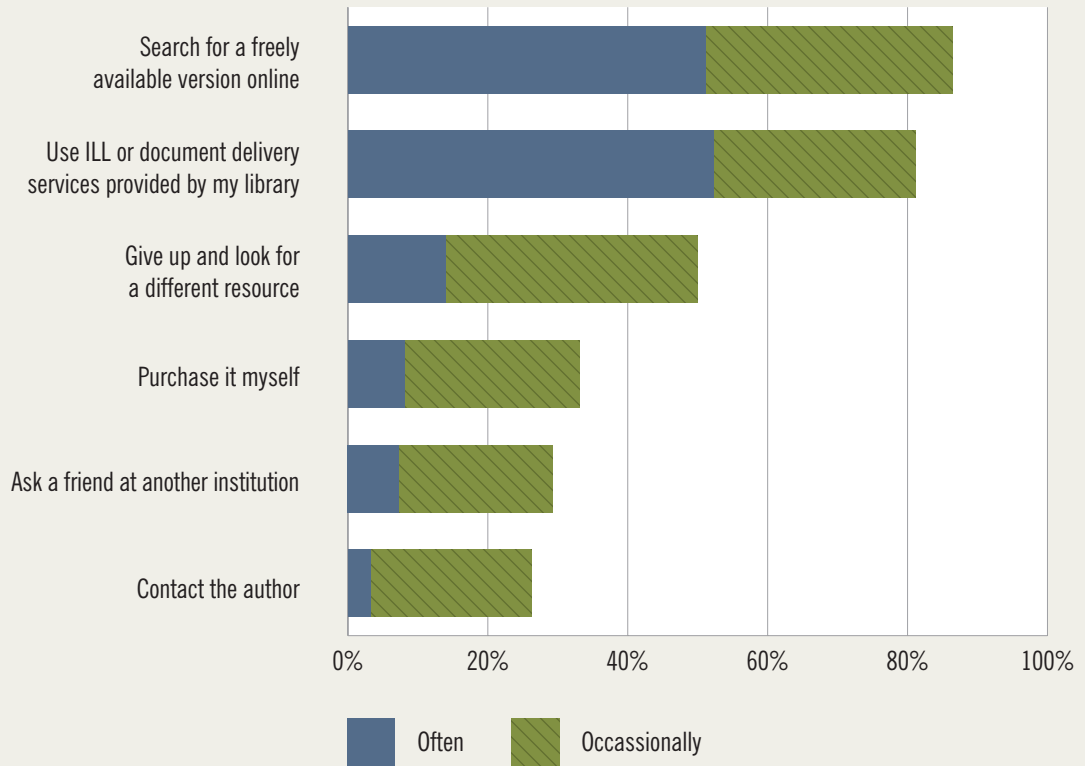
Outside of their college or university library's collections, the source most commonly cited as very important to research and teaching was materials that are freely available online, which was described as very important by about two-thirds of respondents. About 40% of respondents indicated that their own personal collections and subscriptions, which may contain material that their library does not provide as well as materials that they simply prefer to own, are a very important source for materials. A slightly smaller share—about 35%—indicated that other institutions' libraries are very important to their research or teaching, presumably encompassing both the heaviest users of ILL or document delivery services as well as those who may make use of formally negotiated reciprocal borrowing agreements. A much smaller share—only about 15%—indicated that their academic department's collections or subscriptions were very important for their research or teaching.

In addition to exploring sources, we also asked about methods for gaining access to needed materials. When asked how they gain access to needed materials that their institution's library does not directly provide, nearly half of our respondents indicated that they “often” or “occasionally” simply give up and look for a more easily accessed resource.²⁵ But scholars also turn to a variety of avenues for gaining access to needed materials. Four out of five respondents indicated that they often or occasionally use library-provided inter-library loan or document delivery services to access journal articles and monographs (see Figure 18). Similarly, more than four out of five respondents indicated that they often or occasionally look for a freely available online version of materials to which their library cannot

25 This would seem to comport with the findings in Chandra Prabha, Lynn Silipigni Connaway, Lawrence Olszewski, and Lillie R. Jenkins, “What is Enough? Satisficing Information Needs,” *Journal of Documentation* 63:1 (2007), 74-89, <http://www.oclc.org/resources/research/publications/newsletters/prabha-satisficing.pdf>.

FIGURE 18

“When you want a scholarly monograph or journal article that you do not have immediate access to through your college or university library’s physical or digital collections, how often do you use each of the following methods to seek access to that material?” Percent of respondents who indicated that they “often” or “occasionally” use each of these methods.



provide direct access. This is a slightly more common practice in the sciences than in the humanities. About a third of respondents often or occasionally ask a friend at another institution or purchase a needed item themselves, with a smaller share contacting the author directly.

Research topics and practices

In recent years, scholarly research practices, and in some fields research methods as well, have been changing with the introduction of new technologies for scholarship. In recognition of this, Ithaka S+R has set out to explore practices, methods, and associated research support services needs in a variety of key fields.²⁶ In the Faculty Survey, we hope to complement these highly field-specific projects with a set of broader diagnostic questions to examine research practices and methods across the academy. As a nation-wide tracking survey of scholars across a wide range of disciplines, the Faculty Survey is best suited to assessing how widespread certain defined behaviors are across fields, and to lay the groundwork to track change over time. Consequently, we have focused here on the impact of digital technology on changing research practices, and scholars' needs for support in integrating digital technology more deeply into their work.

Selection of research topics

One of the ultimate reasons for the amount of discussion about the impact of digital technology on scholarly practice is that scholars have a tremendous amount of latitude in charting the course of their own research, both in terms of what they will study and how they will go about studying it. Scholars typically choose for themselves whether they will pursue research questions that are well-suited to computational and digital research methods, and if and how they will integrate technology into their research throughout the processes of defining, executing, and reporting on the findings of their research. This flexibility and self-determination is a major motivating factor in many scholars' decisions to become scholars in the first place,²⁷ and unsurprisingly nearly all of our respondents indicated that their own personal interests were very important in their selection of areas of research to pursue.

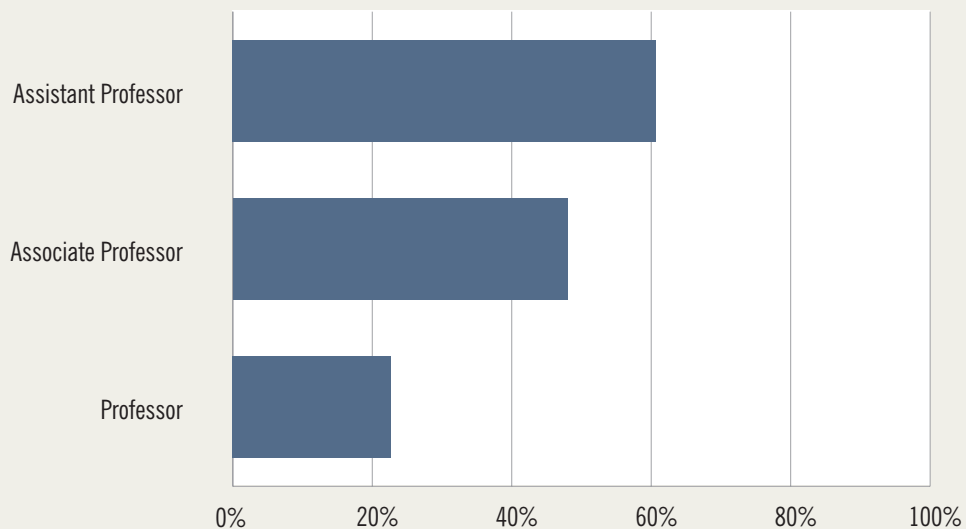
Although scholars value this self-determination, they must balance it with professional considerations about how their choices will be evaluated in tenure and promotion processes. This has been a particular concern for scholars who are interested in pursuing certain types of research (in particular interdisciplinary studies that may not fit neatly into their department's core interests), approaches to research (in particular interest in pursuing digital or otherwise non-traditional research methodologies), or methods of publishing (in particular digital publications that may not closely mirror the traditional publication formats of a discipline). Our more junior respondents—associate and particularly assistant professors—indicated that they take tenure and promotion considerations into account when

26 Matthew Long and Roger C. Schonfeld, *Supporting the Changing Research Practices of Chemists* (New York: Ithaka S+R, 2013), available at <http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-chemists>; Jennifer Rutner and Roger C. Schonfeld, *Supporting the Changing Research Practices of Historians* (New York: Ithaka S+R, 2012), available at <http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-historians>.

27 "Highlights Report 2008: Selected Results from the COACHE Tenure-Track Faculty Job Satisfaction Survey," a Report by the Collaborative on Academic Careers in Higher Education (Harvard: 2008), p.20, <http://sites.harvard.edu/icb/icb.do?keyword=coache&tabgroupid=icb.tabgroup103414>.

FIGURE 19

“When you think about new research projects or areas, how important are [tenure, promotion, and other research assessment requirements] in helping you define and select the areas to pursue?” Percent of respondents who indicated that that “tenure, promotion, and other research assessment requirements” are very important.



selecting their research processes; understandably, this was a much less commonly reported motivation among tenured professors (see Figure 19). Research interests for one’s career may be strongly shaped by these early-stage considerations.

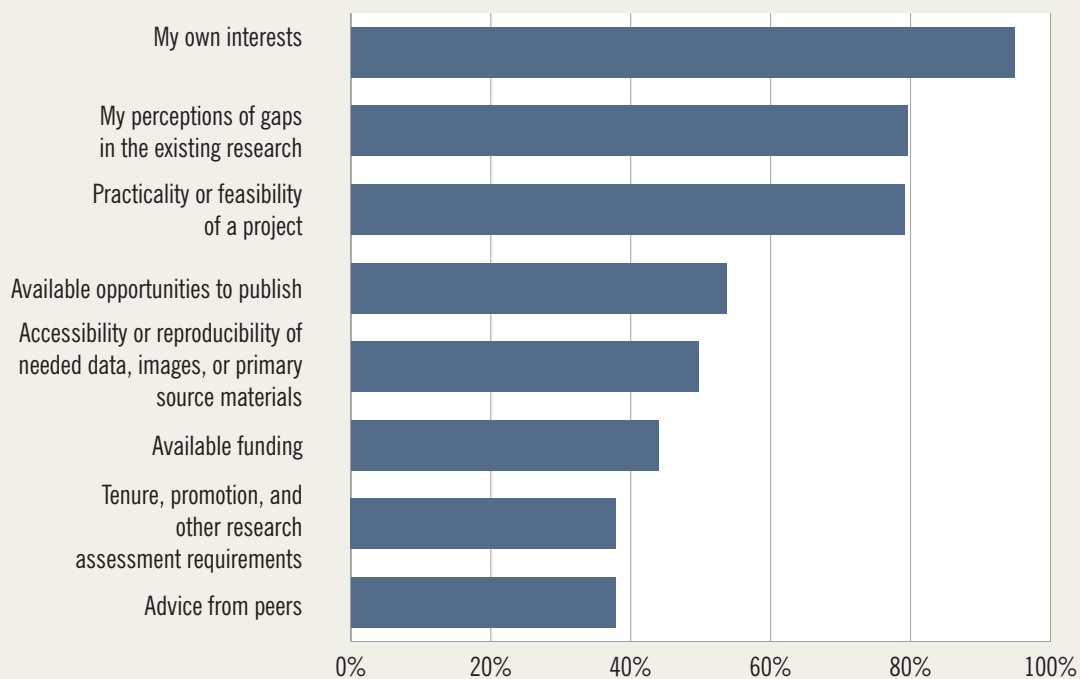
In addition to their personal and professional interests in given topics, respondents also indicated that more practical considerations also play important roles in their selection of topics (see Figure 20). More than three-quarters of respondents indicated that their choice of research was also driven by their “perceptions of gaps in existing research” and the “practicality or feasibility of the project.” About half of respondents agreed that other practical factors about performing and sharing the findings from their research—“available opportunities to publish” and “accessibility or reproducibility of needed data, images, or primary sources”—were important motivations. A slightly smaller share indicated that available funding and advice from peers were important factors.

Collaboration

Across the academy, there are well-worn images of different models of working in diverse fields—humanists are widely imagined as lone scholars, working independently with little or no engagement with others, while scientists are characterized as working in massive labs and releasing papers with lengthy lists of

FIGURE 20

“When you think about new research projects or areas, how important is each of the following in helping you define and select the areas to pursue?” Percent of respondents who indicated that each of these areas is very important.



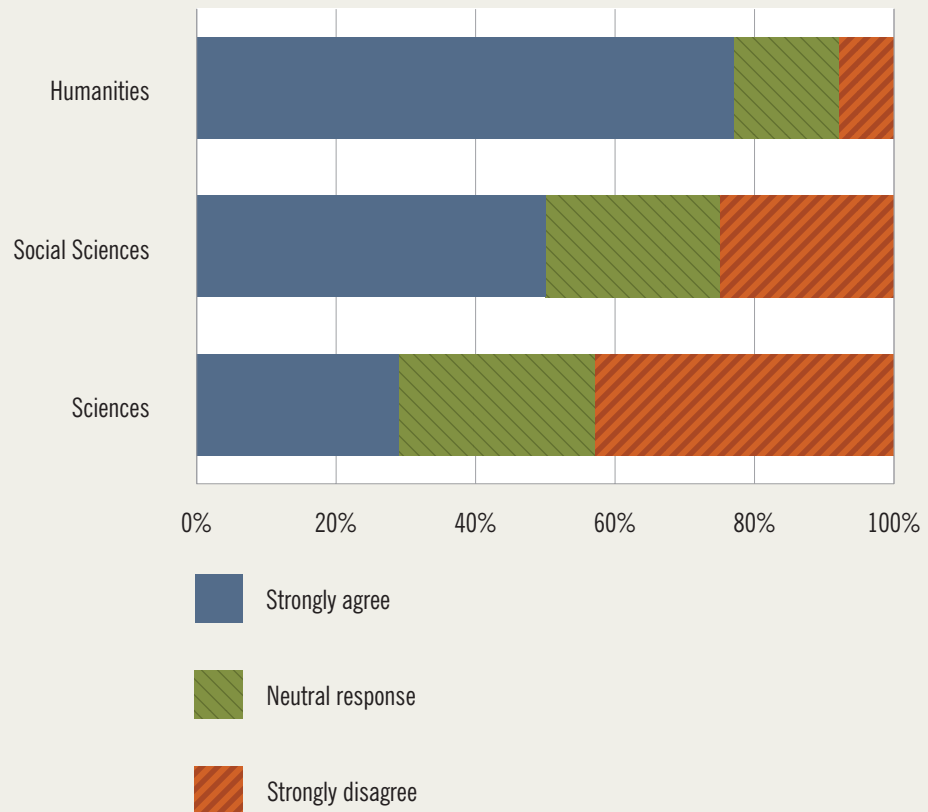
co-authors. In the humanities in particular, there has been active effort to change these perceptions, as many digital humanists have made it a priority to recast humanities scholarship as more deeply collaborative.²⁸

Our respondents clearly demonstrated that these perceptions have their basis in reality, though they are far from universal truths. Among our responses, over 4 out of 5 respondents reported that at some point in their career they have collaborated on a research project with one or more other scholars. But while some level of collaboration was commonly reported across respondents, the prevalence of collaborative research varies significantly by discipline. Virtually all of the scientists reported that they have collaborated with others at some point in their career, while only two-thirds of humanists had done so. But while a large share of respondents in all fields indicated that they have collaborated at some point, about three quarters of humanities and social science faculty members agreed strongly with the statement that “I principally pursue my research alone, with only occasional or informal engagement with other scholars,” while less than a third of scientists indicated that they do so (see Figure 21). These responses reinforce the common perception of the sciences as substantially more collaborative than the social sciences or humanities, but they also demonstrate that there are

28 “Blaise Cronin, “Scholarly Communication and Epistemic Cultures,” Keynote Address, Scholarly Tribes and Tribulations: How Tradition and Technology Are Driving Disciplinary Change (ARL: Washington, DC, October 17, 2003), <http://www.arl.org/bm~doc/cronin.pdf>.

FIGURE 21

"I principally pursue my research alone, with only occasional or informal engagement with other scholars throughout my research process." Responses by disciplinary grouping.



scholars in all groups that work in different ways—solitary scientists, and collaborative humanists and social scientists. We hope to track responses to this question over time from this baseline, to see if and how these broad patterns evolve.

Digital research activities and methodologies

Digital technologies have surely touched almost every researcher's life, with scholars now accessing materials, communicating, and writing with the mediation of a computer. Today, digital technology is also having an impact by enabling such developments as analysis of massive and otherwise intractable datasets,²⁹ the development of sophisticated computer models, and the engagement of the general public into "citizen science" efforts.³⁰

To form a module of questions that would be sensible for a broad survey of this type, we identified a set of research methods and activities that involve digital tools and approaches that could be understood across a variety of fields (see Fig-

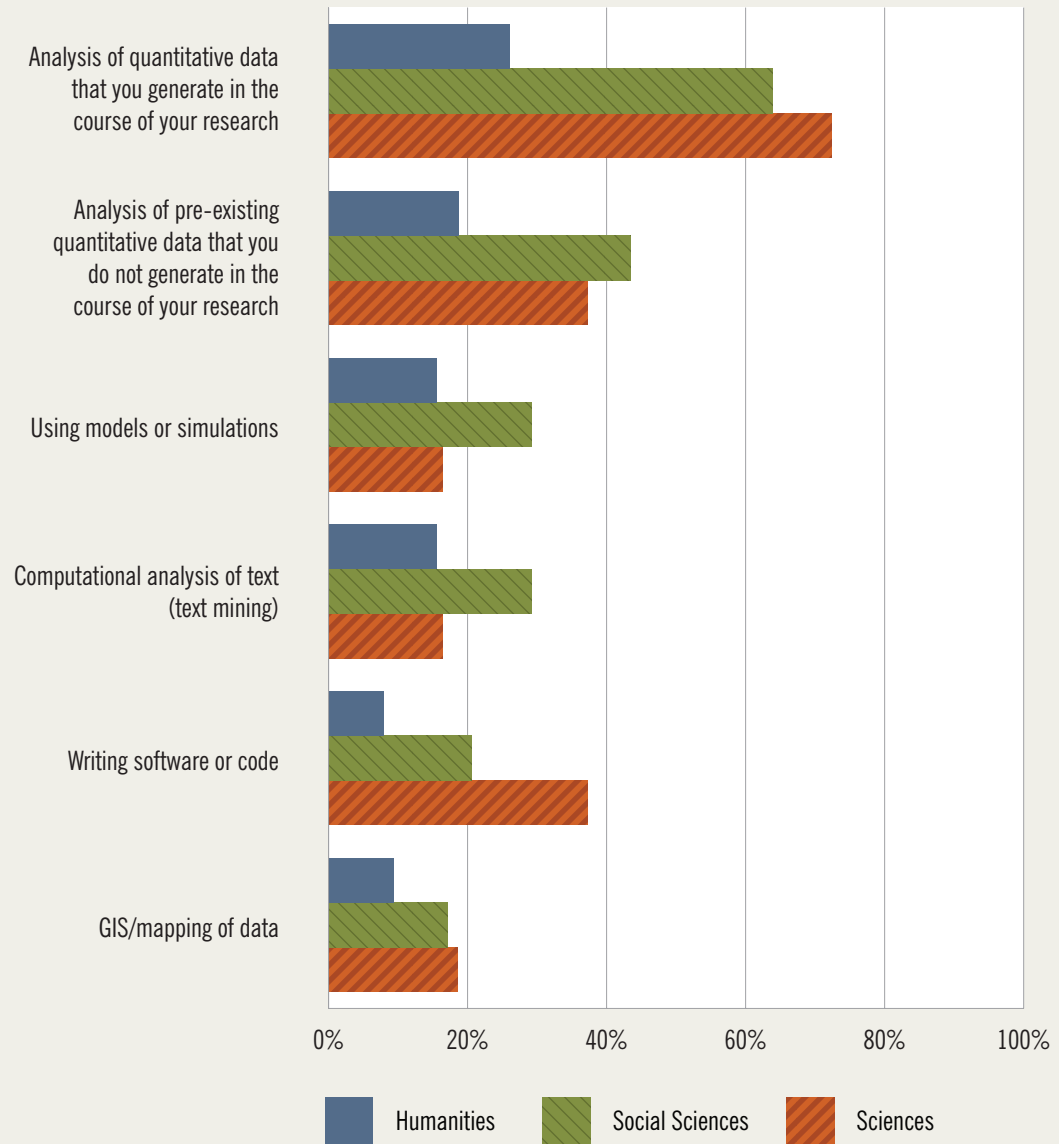
29 See for example the Sloan Digital Sky Survey, <http://www.sdss.org/>.

30 See for example the eBird project, <http://ebird.org/content/ebird>; see also Galaxy Zoo, <http://www.galaxyzoo.org/>.

ure 22). We asked respondents to rate the importance of these for their research. This list is not meant to be normative but rather to explore a set of methods of interest to some observers.

FIGURE 22

“How important to your research is each of the following digital research activities and methodologies today?” Percent of respondents who indicated that each of these methods or activities is very important, by disciplinary grouping.



Scientists and social scientists alike widely reported that analysis of quantitative data, either data generated in the course of one’s own work or pre-existing data, was a very important research method for them. Analysis of pre-existing data was somewhat less commonly described as very important than was analysis of data generated in the course of one’s research, with slightly more social scientists than

scientists describing this as an important practice, indicating a greater reliance among social scientists on common data sets as opposed to experimental practices among scientists. We are interested in tracking the comparative importance of these methods over time, given the diverse efforts to assemble large-scale datasets on topics from astronomy and environmental science to social media records. Although the share of humanists who rated these methods as very important is substantially smaller than the share of either scientists or social scientists, these were still the methods rated as very important by the largest share of humanists. This may show humanists' adoption of well-established methods from other fields rather than the development of unique approaches.

With some other methods, there was more variation between scientists and social scientists, with a larger share of scientists reporting that writing software or code, while a larger share of social scientists rated “models or simulations” or “computational analysis of text” as very important. Some of this may be due to the language of the question, as different terminology may resonate more in some fields.

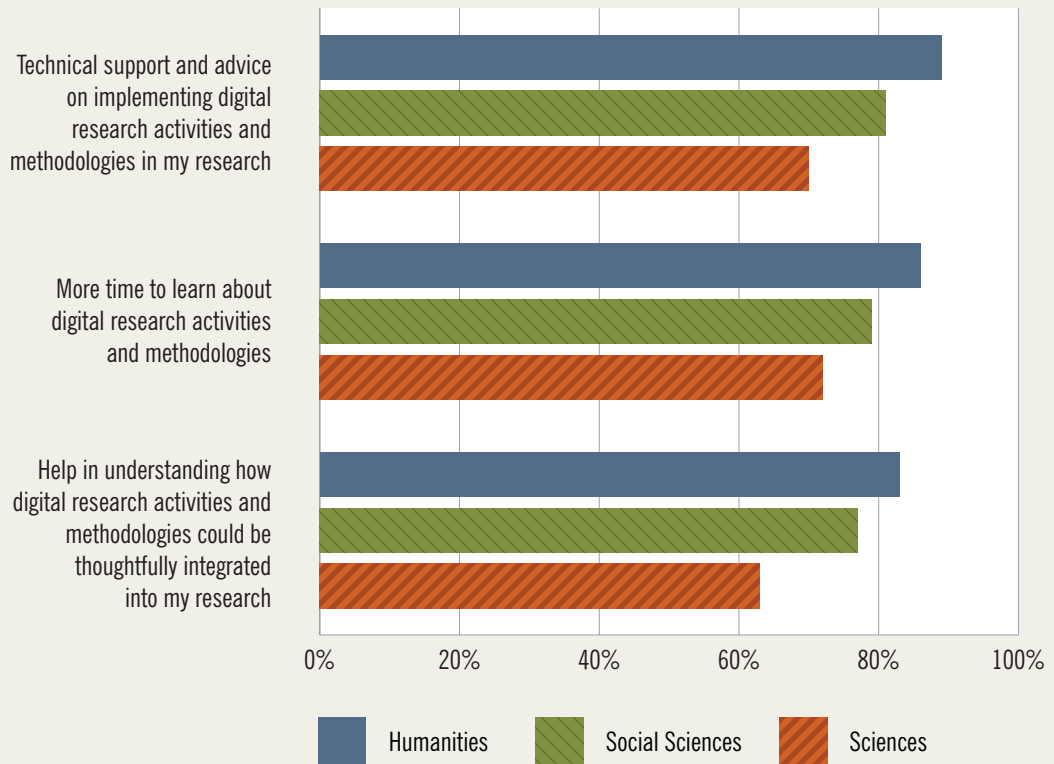
A far smaller share of humanists than of social scientists and scientists indicated that any of these digital methods were very important to their research. Even methods that are believed to be specifically applicable in the digital humanities, such as text mining or GIS mapping, are reported to be utilized by only a minority of humanists. The most widely used methods overall—analysis of either pre-existing quantitative data or quantitative research generated in the course of research—are also the most widely used by humanists. But still, about four out of five humanists reported that none of these methods is very important to their research, and more than half of those who did report using any of these methods indicated that only one of these methods was very important to their research.

We hope to be able to track changes in the adoption of a variety of research methods such as these over the course of time. We asked faculty members if they would like to “more deeply” integrate digital research activities and methodologies into their work. About half strongly agreed that they did, while about 20% strongly disagreed. A relatively greater share of humanists (about a third) strongly disagreed with this statement than did scientists and social scientists (about one in ten).

Interest in integrating digital research activities and methodologies is not necessarily sufficient to being able to actually do so; scholars may require a variety of different types of support in order to meaningfully integrate new practices into their research. Responses to this survey suggest that scholars require a variety of different types of support (see Figure 23). Among those who indicated they were interested in more deeply integrating digital research activities and methodologies, more than three quarters of respondents indicated that each of the factors listed—more time, more conceptual help in understanding how digital research activities and methodologies can be thoughtfully integrated into their research, or technical support for implementing digital research activities and methodologies—would be very important to them. Although there was some slight variation by discipline (a somewhat smaller share of scientists agreed that each of these would be important), these were all rated as very important across the board.

FIGURE 23

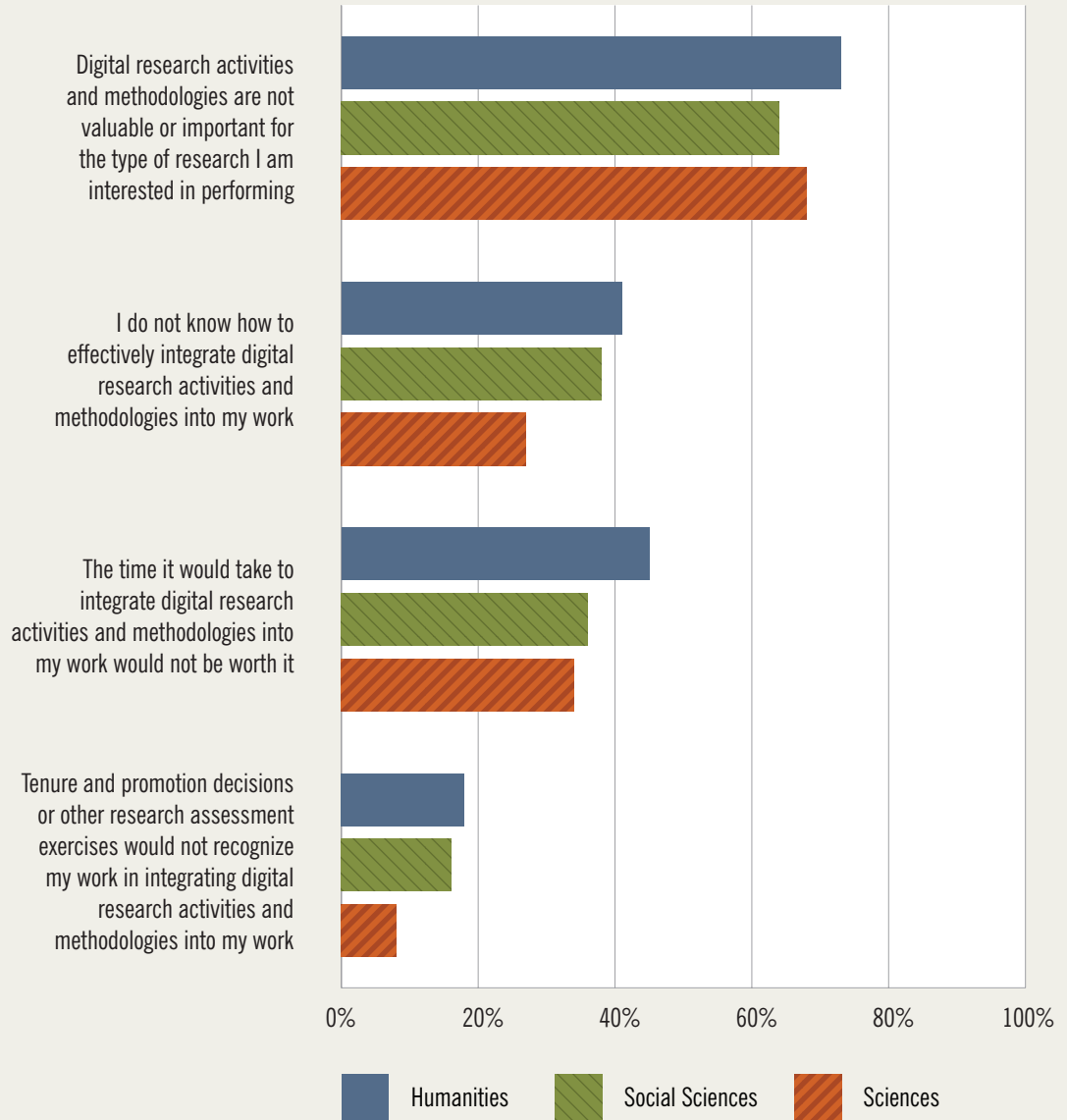
“You indicated that you would like to integrate digital research activities and methodologies more deeply into your work. How important would each of the following factors be in helping you to do so?” Percent responding very important, among respondents who answered that they are very interested to the question “Use the scale below to rate...your level of interest in integrating digital research activities and methodologies...more deeply into your work.”



Other respondents—principally, although not exclusively, faculty in the humanities—clearly indicated that they are not interested in incorporating more technology into their research; among those who indicated they are not interested in more deeply integrating digital research activities and methodologies, over two-thirds of respondents indicated that digital research activities and methodologies are “not valuable or important” for their research (see Figure 24). This does not necessarily indicate that these are technophobic individuals. Although digital practices may influence these scholars’ work in a variety of ways, they do not see the value of integrating digital practices into their work as a deliberate activity. Similarly, two out of five attributed their lack of interest to a perception that integrating digital methods would not be worth the time it would take to do so, while about a third said they were not interested in digital methodologies because they do not know how to integrate them into their work. Only a small number indicated that they were concerned that pursuing this kind of work would not be valued by peers in tenure and promotion decision-making.

FIGURE 24

“You indicated that you would not like to integrate digital research activities or methodologies more deeply into your work. How important would each of the following possible reasons be in explaining why you are not interested in doing so?” Percent responding very important, among respondents who answered that they are very interested to the question “Use the scale below to rate... your level of interest in integrating digital research activities and methodologies... more deeply into your work.”



Undergraduate education

In this cycle of the Ithaka S+R Faculty Survey, we emphasized an examination of faculty members' roles as teachers as well as researchers. Technology is affecting teaching practice as much as it is research practices, and faculty members may require support to integrate technology thoughtfully into their teaching. In recent years, there has been substantial attention in the higher education community to online teaching and learning. Although these kinds of activities have a long history, recent attention has been focused on how interactive learning methods may take hold online.³¹ In the Faculty Survey, we have explored these issues from the instructor's perspective: how technology-enabled pedagogies are being integrated into regular classroom teaching, and how educational priorities beyond the subject-specific, such as research and critical thinking skills training, are best integrated into the curriculum.

The instructional role

To establish a baseline understanding of the kinds of teaching activities in which our respondents participate, we asked a variety of questions about the types of classes they teach and their expectations of the students in their courses. Nearly all respondents indicated that they taught either an upper or lower-division undergraduate course in the past two years, with teaching formats varied by field.³² We asked respondents about their behavior specific to either their upper-division or lower-division undergraduate teaching, in order to identify how their methods differ.

In their undergraduate teaching, respondents reported assigning a range of different types of student work, including problem sets, reading responses, experiments, research papers, and presentations (see Figure 25 and Figure 26). The types of work assigned vary somewhat both by field and by division. Problem sets are far more commonly assigned in the sciences—at both lower and upper divisions—than in other fields, while reading responses are more often assigned in non-science fields. Substantially greater shares of faculty teaching upper division courses assign research papers and presentations. Interestingly, this pattern does not seem to hold in the sciences; science faculty teaching upper division courses did not indicate any greater use of research papers or presentations, and the share

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- 31 Ithaka S+R is exploring these activities, with a particular focus on helping institutions consider how online learning can play a role in their institutional strategy. See Taylor Walsh (for Ithaka S+R), *Unlocking the Gates: How and Why Leading Universities Are Opening Up Access to Their Courses* (Princeton, NJ: Princeton University Press, 2011); William G. Bowen, Matthew M. Chingos, Kelly A. Lack, and Thomas I. Nygren, *Interactive Learning Online at Public Universities: Evidence from Randomized Trials* (New York: Ithaka S+R, 2012), available at <http://www.sr.ithaka.org/research-publications/interactive-learning-online-public-universities-evidence-randomized-trials>; and Lawrence S. Bacow, William G. Bowen, Kevin M. Guthrie, Kelly A. Lack, and Matthew P. Long, *Barriers to Adoption of Online Learning Systems in U.S. Higher Education* (New York, Ithaka S+R, 2012), available at <http://www.sr.ithaka.org/research-publications/barriers-adoption-online-learning-systems-us-higher-education>.
- 32 Nearly all faculty respondents who have taught either upper-level or lower-level undergraduate courses in the past two years reported that their courses include lecture-format teaching, while about three-quarters reported that their courses include seminars or discussion sections. Seminars or discussion sections were substantially more common among humanities and area studies faculty respondents—nearly ubiquitous among these faculty teaching upper-level courses—and were least common in lower-level science courses. Laboratories followed an understandably different pattern, being quite uncommon in the humanities, area studies, and social sciences while being employed by about two-thirds of scientist respondents.

FIGURE 25

“How often do you assign each of the following types of coursework in the lower division undergraduate courses you teach?” Percent of respondents indicating that each type of coursework is assigned often or occasionally, by disciplinary grouping.

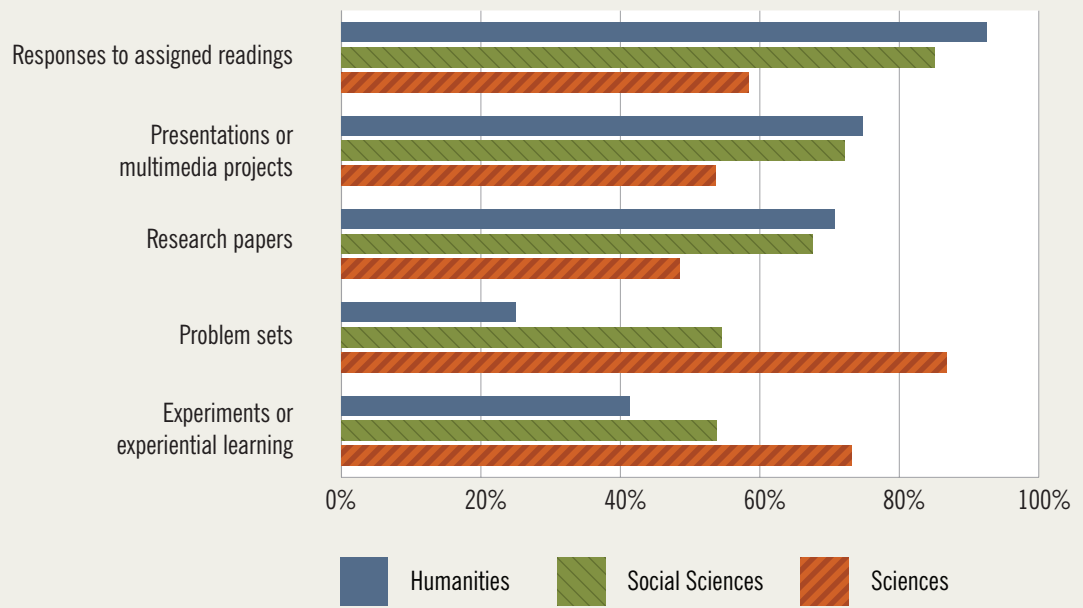
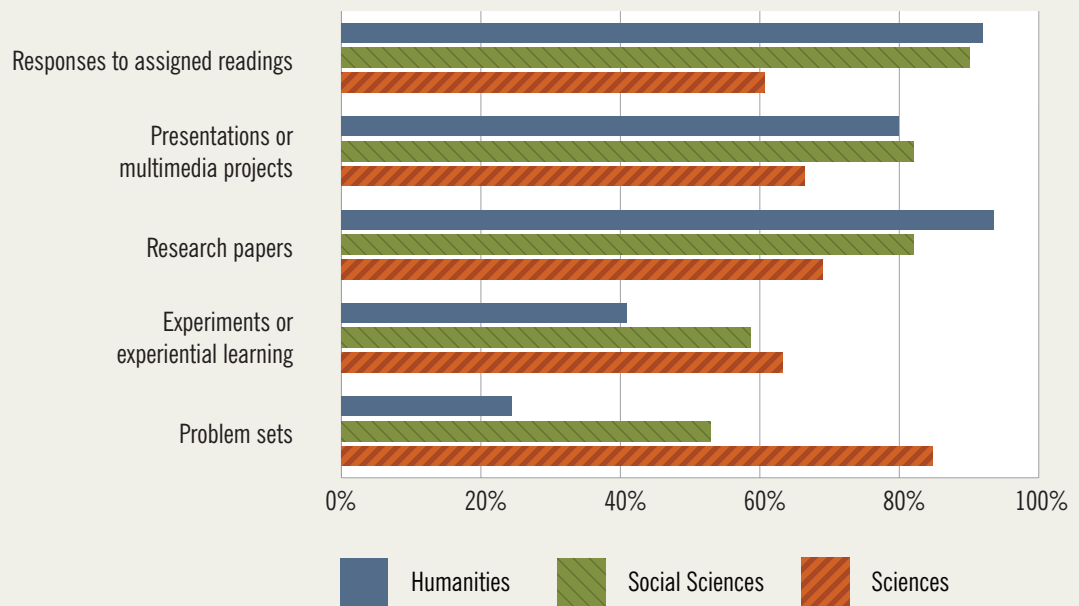


FIGURE 26

“How often do you assign each of the following types of coursework in the upper division undergraduate courses you teach?” Percent of respondents indicating that each type of coursework is assigned often or occasionally, by disciplinary grouping.



assigning experiments was actually slightly smaller. And, a substantially smaller share of science faculty members agreed strongly with the statement that they regularly include undergraduate students in the research projects they lead, in comparison with other fields.

Use of technology-enabled pedagogies

There is a long history of interest in the academic community in bringing technology into the classroom, ranging from explorations of the use of “clickers” through more recent interest in “flipping the classroom” by having students watch videos of lectures in order to reserve class time for more engaging activities.³³ Although many technical barriers to using technology in the classroom have been lowered, there may still exist substantial policy, training, or interest constraints that continue to limit this kind of activity.

Of the list of uses of technology in the classroom about which we asked, only two garnered a majority of respondents who indicated that they are often or occasionally used practices (see Figure 27 and Figure 28). One widespread practice, perhaps the most traditional one listed, is showing videos in the classroom, as one component of a lecture or discussion or as a replacement for one of them.

33 Dan Berrett, “How ‘Flipping’ the Classroom Can Improve the Traditional Lecture,” *The Chronicle of Higher Education*, February 19, 2012, <http://chronicle.com/article/How-Flipping-the-Classroom/130857/>.

FIGURE 27

“In your undergraduate teaching, you may have had the opportunity to introduce new pedagogies or approaches that take advantage of the opportunities offered by digital technology to change how you impart knowledge to your students, assign readings and coursework, and evaluate your students. How often do you do each of the following in your undergraduate teaching—often, occasionally, rarely, or never?” Percent responding “often” or “occasionally.”

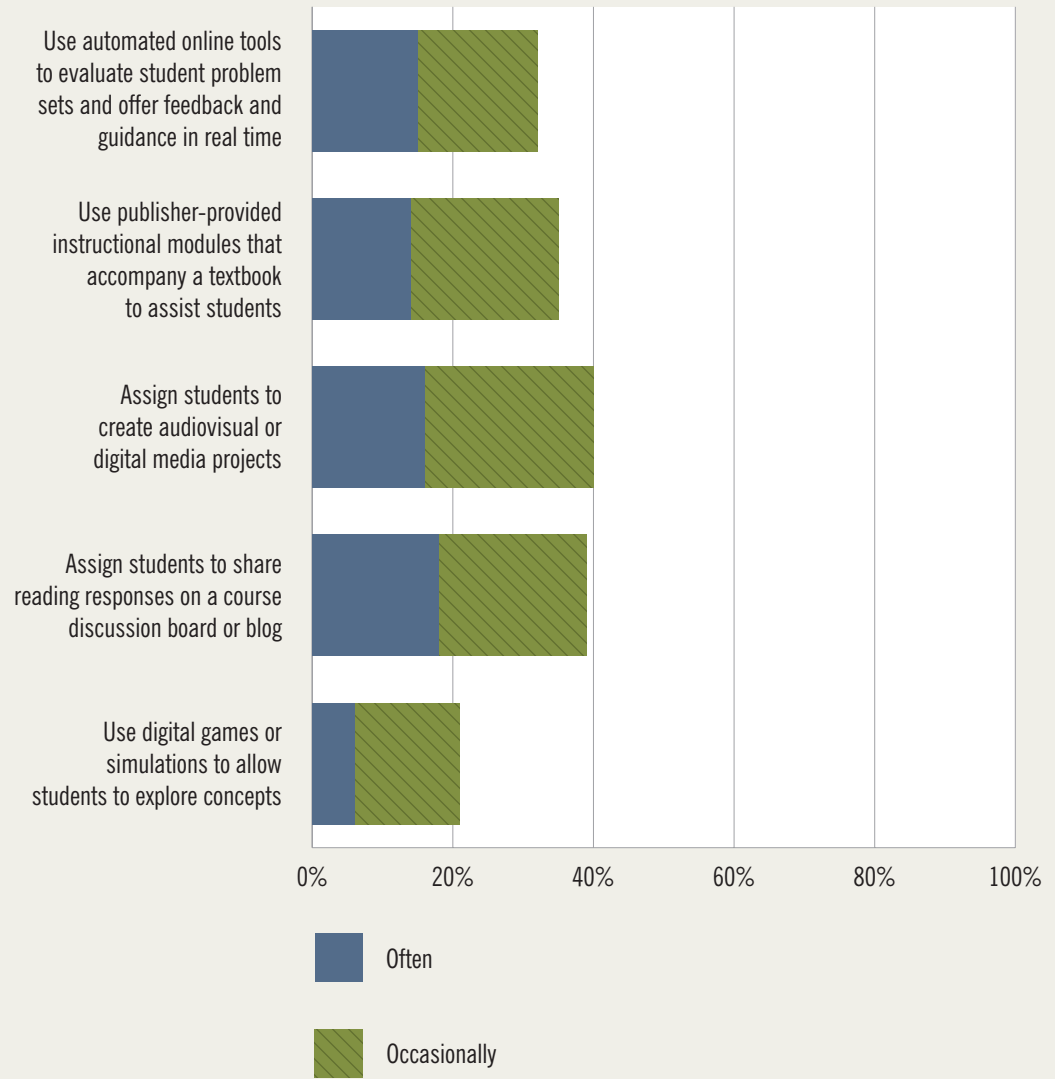
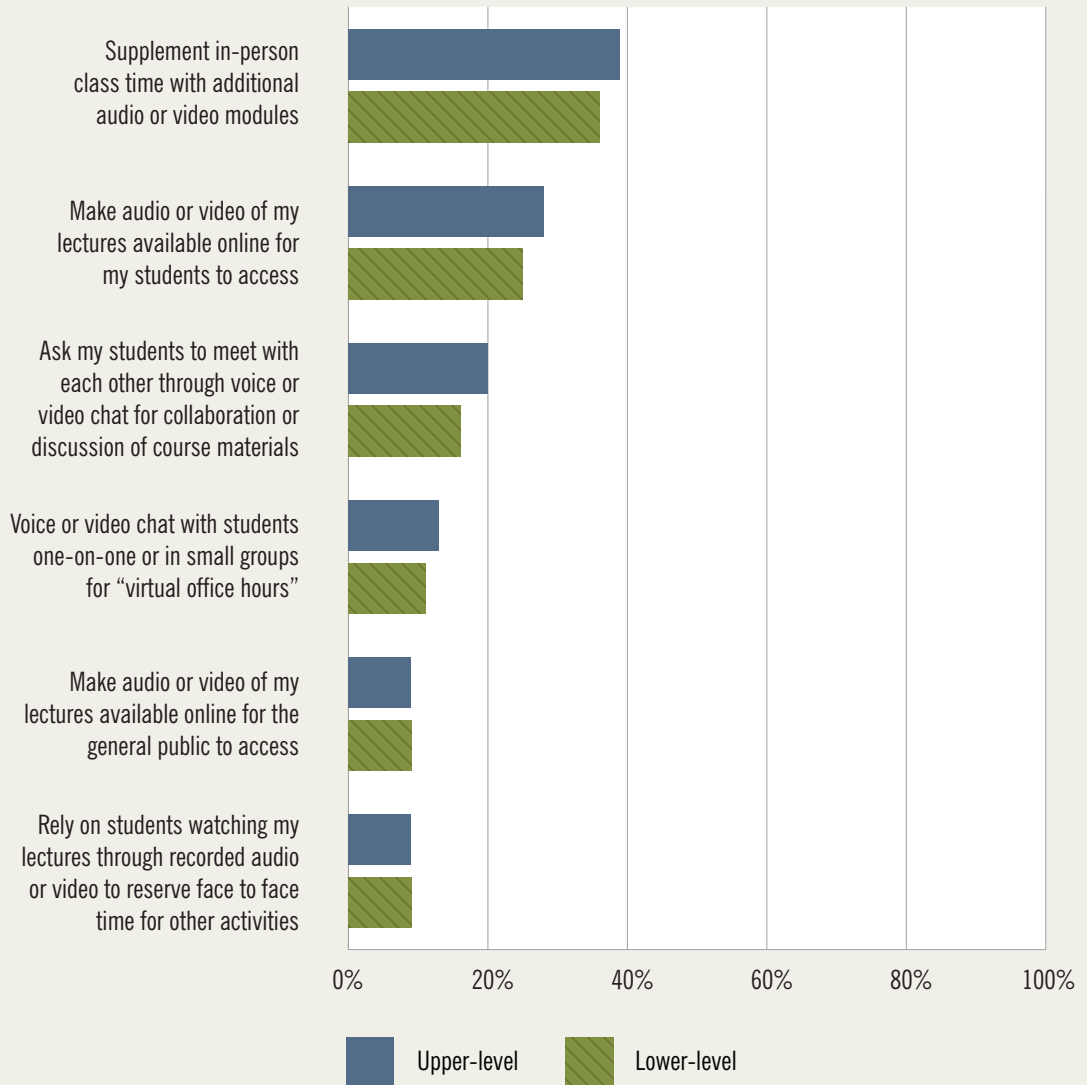


FIGURE 28

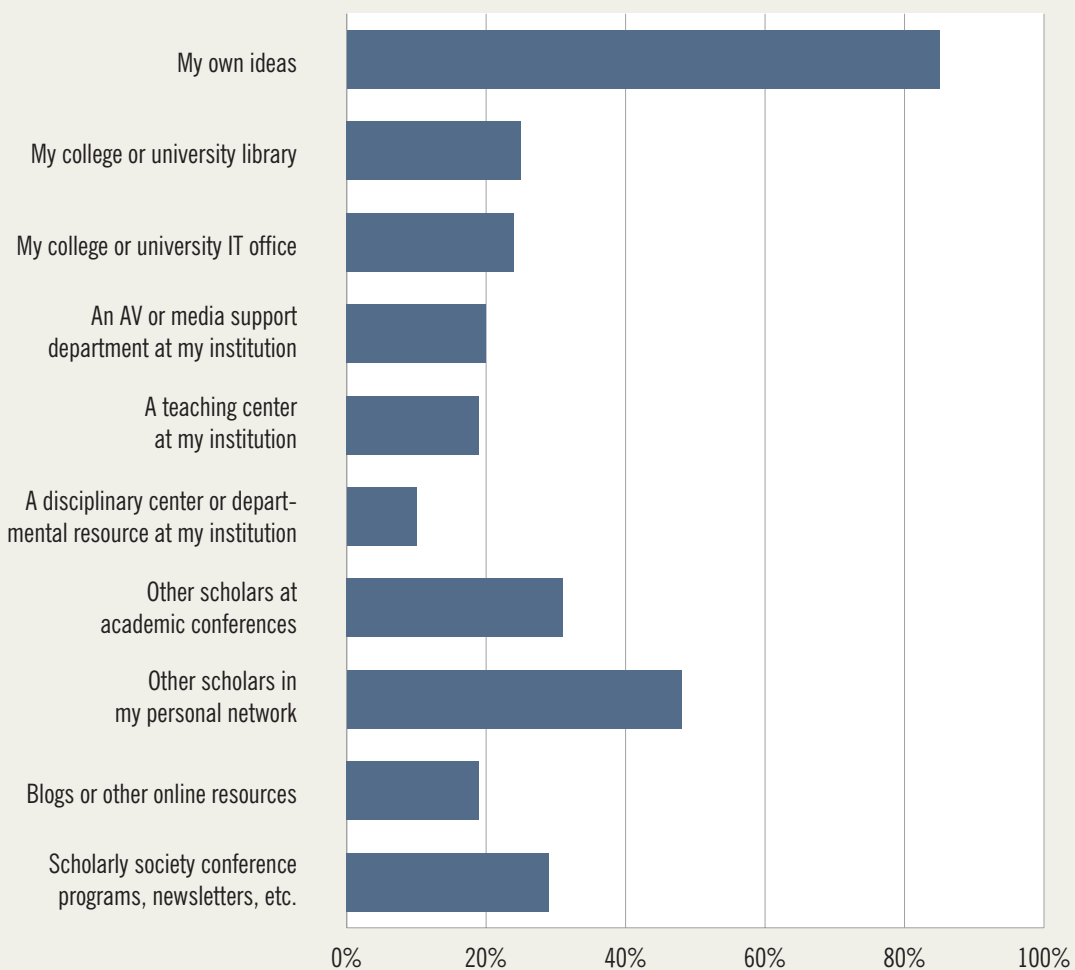
“Whether you do it yourself or you are supported by a college or university service in doing so, how often do you utilize each of the following techniques in your [upper division | lower division] undergraduate courses—often, occasionally, rarely, or never?” Percent of respondents indicating that they utilize each technique often or occasionally, by division of course.



The other widely used teaching technology is using “email lists or discussion boards on a course management system” to facilitate collaboration and discussion beyond the classroom. Among those faculty members who teach laboratory-based classes about two-thirds of respondents reported that they sometimes “supplement labs with digital simulations,” but of these only 1 out of 10 do it often, while the other 50% reported occasional or rare use. While they may use digital simulations to supplement labs, very few reported replacing labs completely.³⁴

FIGURE 29

“Please use the scale below to rate . . . how much you rely on each of the following possible sources of instructional support when introducing new pedagogies or approaches that take advantage of the opportunities offered by digital technologies” Percent of respondents indicating that they rely heavily on each of the following.



34 The questions about email lists and labs were separate from the list presented in the graph, and so these numbers do not appear on the graph.

Making videos publicly available has been an important component of high-profile projects such as Open Yale Courses. A quarter of faculty respondents indicated that they often or occasionally make audio and video of their lectures available online for their students to view, and slightly less than 10% indicated that they often or occasionally rely on students to watch recorded lectures in order to reserve face to face time for other activities (commonly known as “flipping the classroom”). A similarly small share indicated that they often or occasionally make audio or video of their lectures available online for the general public to access.

Respondents use a host of other technologies at varying levels of regularity. Roughly 25 to 40 percent indicated that they often or occasionally use technologies in support of student learning, including assigning students to share reading responses on a course blog, assigning them to create audiovisual or digital media projects, using publisher-provided instructional modules that accompany a textbook, or using automated online tools to evaluate student problem sets and offer feedback and guidance. There is some moderate and expected disciplinary variation here, related to the underlying types of work—science faculty employ automated evaluation of problem sets more often, and ask students to share reading responses online less often, which mirrors their overall pattern of use of problem sets and reading responses as types of assignments. Smaller shares of faculty members indicated that they make themselves available for voice or video chat (“virtual office hours”), use digital games or simulations in the classroom, keep in touch with their current students, or ask students to meet with each other using voice or video chat for collaboration or discussion. In all cases, the share of faculty members who employ these methods is relatively low, with particularly small shares who indicated that they “often” do so.

Support for technology-enabled pedagogies

Just as scholars may require support to understand how and why to integrate technology into their research, they may also require substantial support to conceive of and put into practice new technology-enabled pedagogies. Only a quarter of respondents agreed with the statement that their institution “recognizes or rewards faculty” for taking the time to integrate new digital technology and pedagogies.

In general, about half our respondents strongly agreed that “my institution offers excellent training and support to help me adopt new pedagogies or instructional approaches that take advantage of the opportunities offered by digital technology” (see Figure 29). But the share of respondents who reported relying heavily on institutional sources for support was relatively low, with only a quarter reporting that they rely on their college or university library or a college or university IT office when introducing new approaches that take advantage of digital technologies. Only a small share reported that they rely on media support departments, teaching centers, or disciplinary centers at their institution. Beyond their institution, about a third reported that they rely heavily on support that they get from academic conferences or scholarly societies, either from other scholars at conferences or through society programs and newsletters, and a very small

share reported relying on blogs or other online resources. Instead of these formal resources, most faculty reported relying on their “own ideas,” and half reported relying on “other scholars in their personal network.”

Developing student research skills

In addition to these course-specific aspects of undergraduate pedagogy and support, colleges and universities often afford curricular attention and instructional support for skills that fall outside the confines of a single academic subject. Examples include cultural diversity, quantitative reasoning, research skills, and critical thinking. We are interested in how instructors engage with these issues in their own classrooms and in partnership with support providers. There has been substantial interest in this topic among librarians in particular, driven by an interest in how students develop “information literacy” skills to find, evaluate, and make effective use of information.³⁵ But while our respondents indicated that their students often lack these skills, the results did not give clear direction on how they would like for this need to be addressed.

In addition to the materials that they directly assign their students to read, most respondents expect students to find and use material beyond assigned readings in their coursework, as shown in the questions above. Predictably, the expectations are higher for upper division undergraduates, where over two-thirds of respondents expected outside use of secondary sources, and 3 out of 5 expected students to find and use their own primary source material.

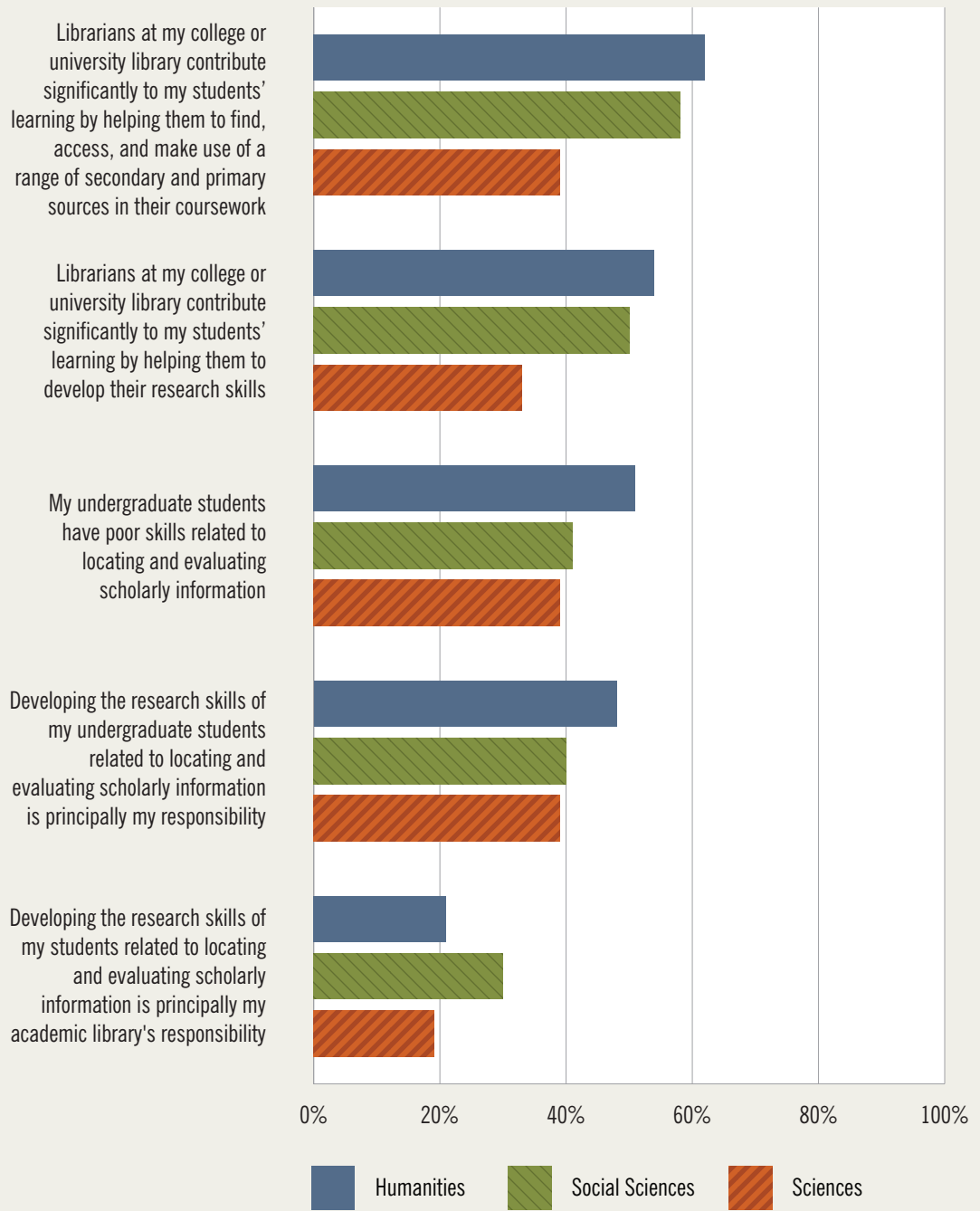
But while faculty reported expecting students to go beyond assigned materials, they are not especially confident in their students’ abilities to do so effectively (see Figure 30). Overall, nearly half of respondents feel their undergraduate students have “poor skills related to locating and evaluating scholarly information,” and an especially large share of faculty in the humanities reported significant concern regarding these skills. And our questionnaire did not elicit a clear answer as to how students should develop these skills from respondents. About 40% agreed strongly that “developing the research skills of my undergraduate students related to locating and evaluating scholarly information is principally my responsibility.” Despite a substantial focus in the library community on establishing a library role in developing information literacy, only about 20% of faculty member respondents agreed that “developing the research skills of my undergraduate students related to locating and evaluating scholarly information is principally my academic library’s responsibility.” This raises significant questions about faculty members’ engagement with library-led information literacy programs.

But while most faculty did not agree that developing research skills was primarily the library’s responsibility, about 45% of respondents agreed that librarians help students to “develop their research skills,” and a slight majority agreed that libraries “contribute significantly to my students’ learning by helping them to find,

35 See for example the “Introduction to Information Literacy,” by the Association of College & Research Libraries, <http://www.ala.org/acrl/issues/infolit/overview/intro>.

FIGURE 30

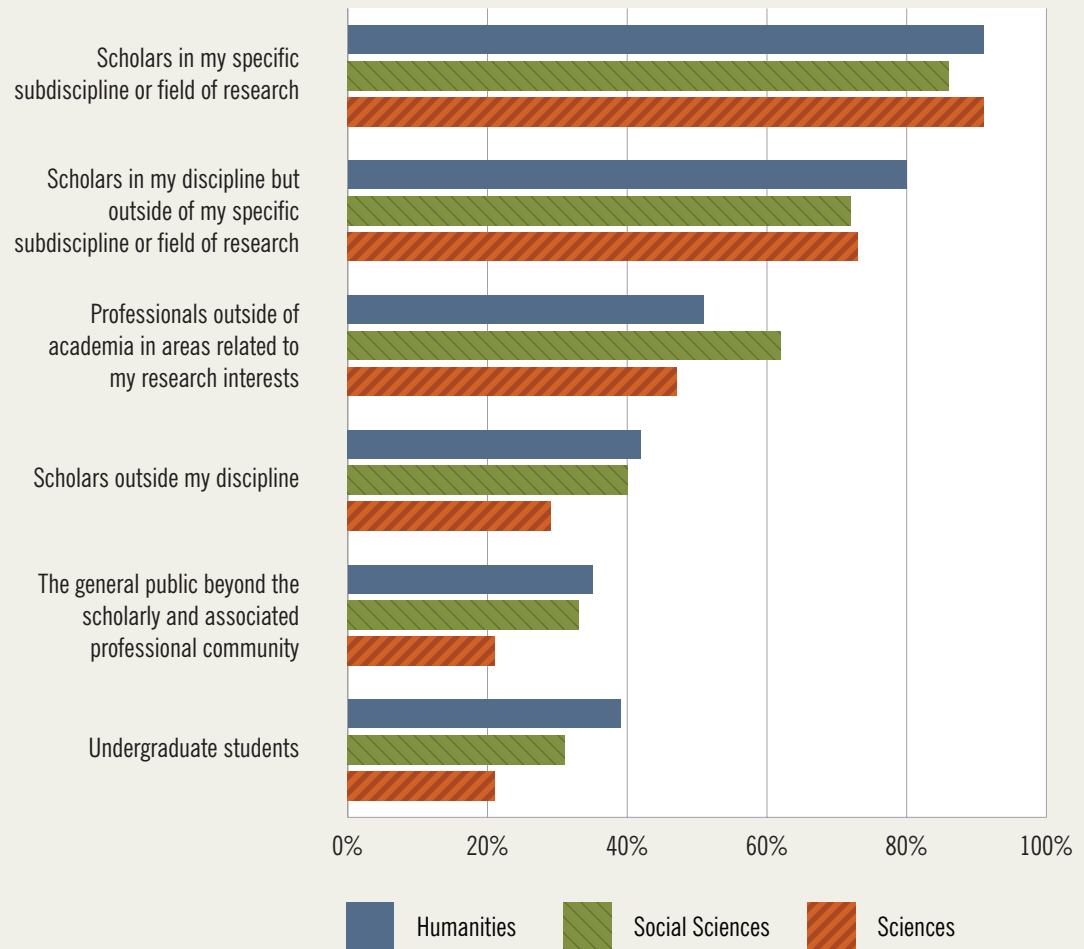
Percent of respondents strongly agreeing with each statement, by disciplinary grouping.



access, and make use of a range of secondary and primary sources in their coursework.” However, in both cases a substantially smaller share of faculty respondents in the sciences agreed with these statements. Over half of respondents indicated that they believed that their students engage with librarians at their campus often or occasionally, and about 40% agreed strongly that interaction with librarians helps students to succeed in their courses. Again, in both cases, a smaller pro-

FIGURE 31

“How important is it to you that your research reaches each of the following possible audiences?”
Percent of respondents who indicated each is a very important audience, by disciplinary grouping.



portion of scientists indicated that they believed their students engaged with librarians and that they believed that interacting with librarians helped students succeed. This raises important questions about a perceived mismatch between library services and the needs of undergraduates in the sciences.

Research dissemination

The impact—both actual and future potential—of digital technologies on the ways in which scholars communicate with each other through all channels cannot be overstated. As traditional scholarly communications media—journals, and increasingly books as well—have been made available online, the marketplace for these materials has changed significantly. And new media and variations on traditional formats have offered up new opportunities for communication among scholars. The Faculty Survey contributes to the community conversation on these issues by continuing its exploration of how scholars make choices related

to publishing, both in order to understand broadly the role that publication plays in scholarly practice and to understand how scholarly behaviors may relate to these kinds of ongoing debates about the future of scholarly communications.

Audience

To shed light onto the various audiences that scholars may seek to reach, we asked faculty how important it is to them that their work reaches different types of audiences, from scholars in their specific subdiscipline to a general audience. Not surprisingly, their responses clearly indicate that scholars in their immediate field are the audience most widely viewed as important, with those beyond their immediate niche relatively less widely rated as important (see Figure 31). Virtually all respondents indicated that it is extremely important to them that they reach scholars in their own subdiscipline or field of research, and three out of four respondents also identified scholars in their broader discipline (but outside of their specific subdiscipline or field of research) as an important audience. Far fewer—about a third of respondents—indicated that scholars outside of their discipline were a very important audience, with a slightly higher share in the interdisciplinary area studies. A slightly smaller share indicated undergraduates to be a very important audience.

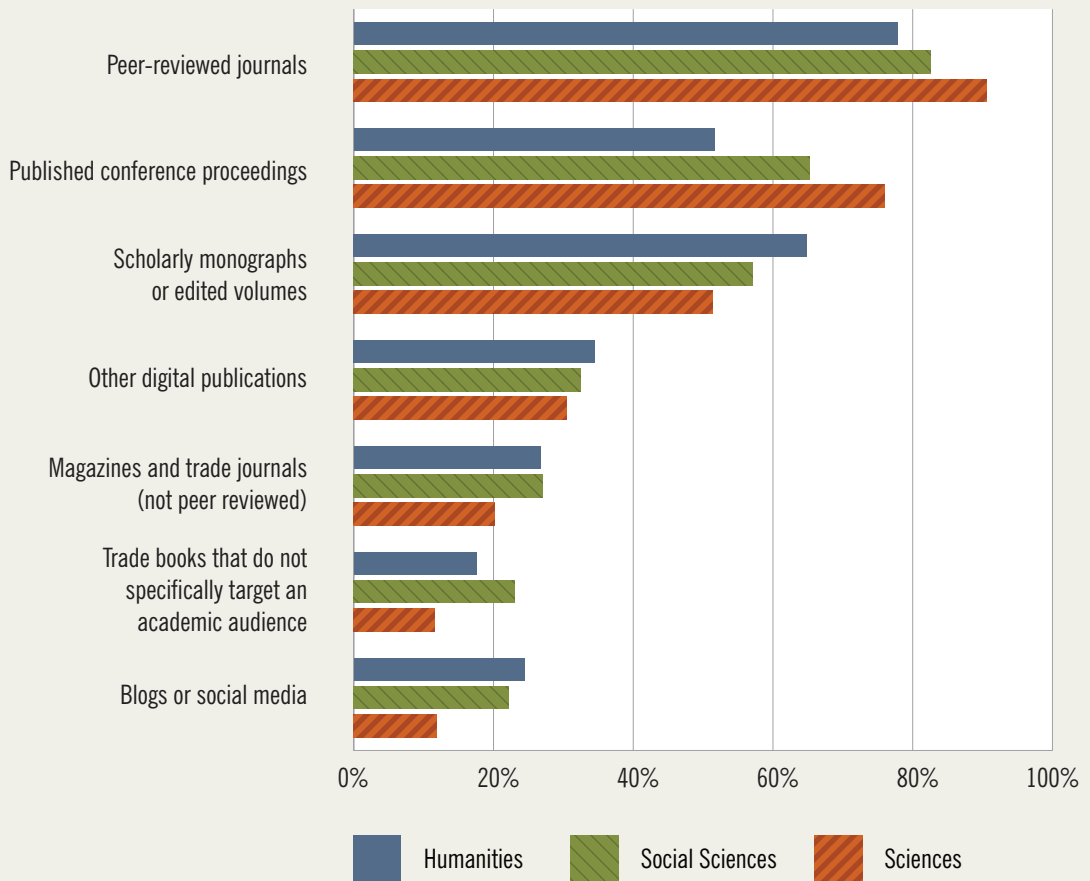
Although there is relatively widespread interest among respondents in reaching audiences outside of academia, there is substantial variation in interest between different groups of non-academics. Over half of respondents ranked “professionals in my field outside academia” as a very important audience for their work. Here, there was some variation between disciplines; this was an important audience in particular for scholars in the social sciences, two-thirds of whom ranked this as a very important audience. This probably reflects the strong connections between many social scientists’ work and current policy issues. But only a relatively small share of respondents—less than thirty percent—identified the general public beyond the scholarly and associated professional community as a key audience, with roughly the same share who indicated that the general public was “not at all” an important audience. Scientists in particular ranked the general public poorly as an audience, with twice as many respondents who indicated the general public was a not at all important audience as indicated that it was a very important audience.

Publication choices

As faculty members reported that their immediate peers are a key audience, it is unsurprising that their choices in the publication process largely reflect this prioritization. Respondents reported that they publish most frequently in the scholarly communications formats that they themselves read, and that they choose specific venues based on their perceived reach to other scholars like themselves (see Figure 32).

FIGURE 32

“You may have the opportunity to share the findings of your scholarly research in a variety of different formats. Please . . . indicate how often you have shared the findings of your scholarly research in each of the following ways in the past five years.” Percent of respondents indicating they have often or occasionally shared research in each way, by disciplinary grouping.



Responses about the formats in which scholars publish largely mirrored the disciplinary patterns seen in responses about the formats that they read. Respondents clearly indicated that the long-established formats of scholarly journal articles, monographs, and conference proceedings are widely important, although with disciplinary differences.

- The vast majority of respondents indicated that they had shared the findings of their research in peer-reviewed journals either “often” or “occasionally” in the past five years. Peer reviewed journals are slightly more ubiquitous in the sciences, but quite important across the board.
- Over half indicated that they had often or occasionally shared findings in scholarly monographs/edited volumes. Monographs are more commonly published by humanists and area studies faculty than social scientists and scientists.

- Over half also indicated that they had often or occasionally published conference proceedings. This practice is substantially more commonly in the sciences in particular.
- Smaller shares of faculty members indicated that they regularly publish in other formats at all regularly, with less than 10% of faculty who indicated that they “often” publish their work in magazines, trade journals, trade books, blogs/social media, or other digital publications.

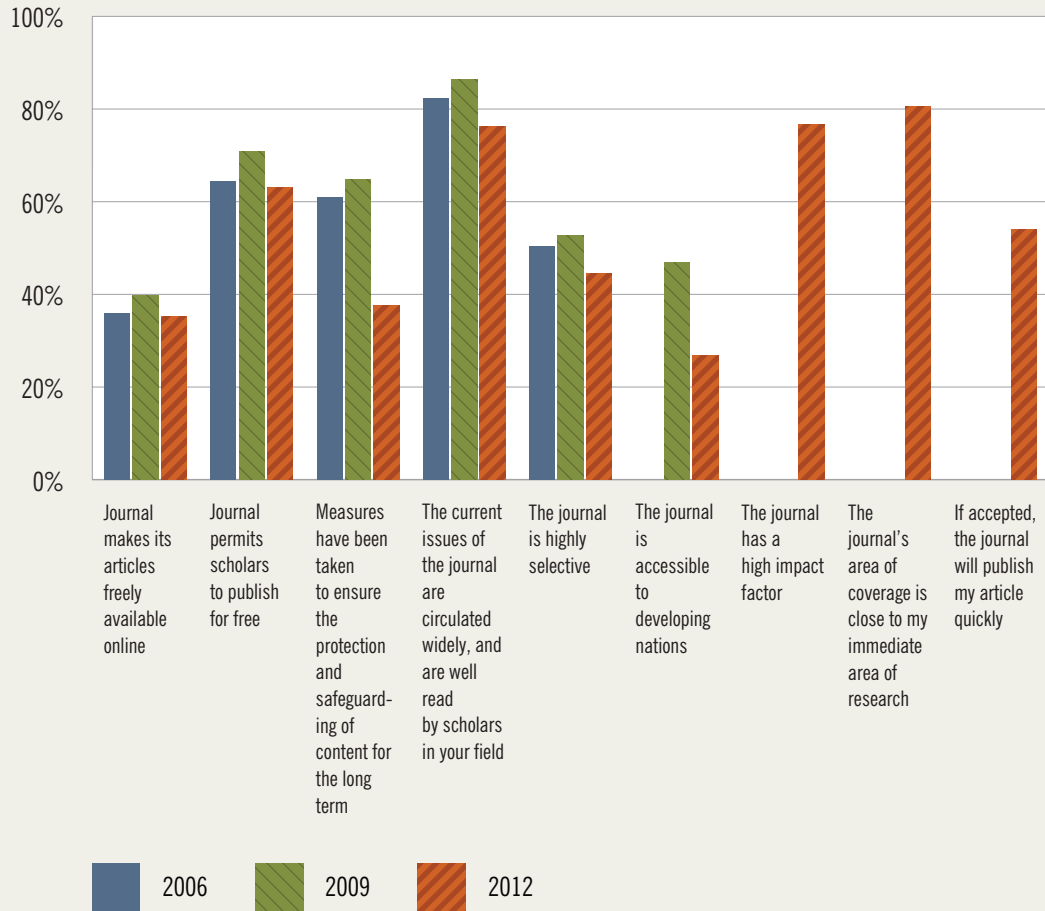
Many discussions about the changing scholarly communications landscape have focused on the journal, demonstrating its prominence in faculty publication and reading practices. Respondents to the Faculty Survey have over several cycles consistently indicated that factors relating to a publication’s reach to scholars’ immediate peers are of the most importance to them in selecting a journal in which to publish (see Figure 33). In this cycle, we added three additional journal characteristics to the results, which can therefore not be tracked for change versus previous measurements. There are three factors that roughly three-quarters of respondents indicated were very important in their selection of a journal: the journal’s area of coverage is close to faculty’s immediate area of research, the journal has a “high impact factor,” and the journal is widely circulated and “well read” by scholars in the field.

Factors related to the convenience of the author were also rated as important by a majority of respondents. More than 60% of respondents rated the journal’s policy of allowing scholars to publish for free as a very significant factor, although this was somewhat more important to scholars in the humanities than it was to those working in the sciences, which perhaps reflects tighter funding constraints. A slight majority of respondents also reported that the journal’s ability to publish quickly was an important factor in deciding where to publish.

Other factors were rated less highly. For example, only 2 out of 5 respondents think it was important that the journal is “highly selective.” While selectivity may sometimes be discussed as a proxy for quality, it is clear that impact factor and audience are the more essential qualities for faculty members. Preservation is an even less important factor, with a sharp decline in the perceived importance of preservation since 2009. The fact that the journal “makes its articles freely available on the internet, so there is no cost to purchase and read” remains among the lowest priorities to scholars in selecting a publication venue; only about a third of respondents indicated this was a very important factor. The least important factor is the journal’s accessibility to developing nations. A substantially smaller share of respondents rated this factor as very important in the 2012 cycle than in previous years. The sharp change in responses on the points of developing nations and preservation are somewhat difficult to explain. It may be that the addition of more options in this cycle of the survey has changed response patterns somewhat. Although the shares of respondents who rate these related factors as important are by no means trivial, they have remained relatively small compared to other factors over the several times that this question has been asked.

FIGURE 33

“When it comes to influencing your decisions about journals in which to publish an article of yours, how important to you is each of the following characteristics of an academic journal?” Percent of respondents who indicated that each of these characteristics is very important, over time.



The publication process

In recent years, alternative ways of circulating information have proliferated, including scholars' sharing of pre-prints and final versions of their work directly with their peers. This has raised some concern that these newer, often informal models are making traditional publishers obsolete.³⁶ However, less than one in five respondents across disciplines strongly agreed that their ability to share work directly with peers has made scholarly publishers less important, with almost half of respondents strongly disagreeing; this brings into question the rhetoric of decline in publishing.

All of the publisher roles about which we asked were rated as very important by more than half of respondents (see Figure 34). Of these, managing the peer-review process to provide high-quality feedback was rated important among the highest share of respondents (70%), suggesting that scholars ultimately seek publishers' facilitation of a process that helps them improve their research outputs. Providing professional copy-editing is considered very important by slightly more than half of respondents.

In addition to the model of communicating scholarship through a traditional publication, some scholars have made their research directly available to peers in a variety of ways, including circulating pre-print copies of scholarly articles online. Overall, a third of faculty strongly agreed that circulating pre-print versions of their research was an important way for them to communicate their research findings with their peers, but in certain key disciplines where this practice is well-established and where disciplinary repositories exist—for example, physics and related sciences served by the arXiv, and the field of economics, served by a long-standing practice of sharing working papers—this practice is much more common. Slightly less than a third of respondents indicated that they make final or pre-print versions of their work available through a personal webpage or blog, a repository provided by their college or university, or a discipline-focused cross-institutional repository. Although the overall share that makes their research thus available is low, there are some interesting disciplinary patterns. The share of respondents who make their work available through a personal webpage is relatively higher in the sciences than in other disciplinary groupings, while the share making their work available through an institutional repository is relatively lower in the sciences than in other disciplinary groupings.

Dissemination support services

In addition to the roles played directly by publishers themselves, we were interested to see how faculty members' research dissemination activities can be better supported. In the Faculty Survey, we avoided identifying a particular enterprise that would be the appropriate home for such services. Instead, we identified several research dissemination support services that could be provided by a library, scholarly society, university press, or another service provider.

36 Rupert Gatti, "Open Access: 'We no longer need expensive publishing networks,'" The Guardian's Higher Education Network Blog, <http://www.guardian.co.uk/higher-education-network/blog/2012/nov/08/open-access-academic-publishing-models>.

FIGURE 34

“Thinking back to the last scholarly article or monograph that you published, how valuable to you were the activities performed by your publisher in each of the following aspects of this process?” Percent of respondents who indicated that each of these activities were very important, by disciplinary grouping.

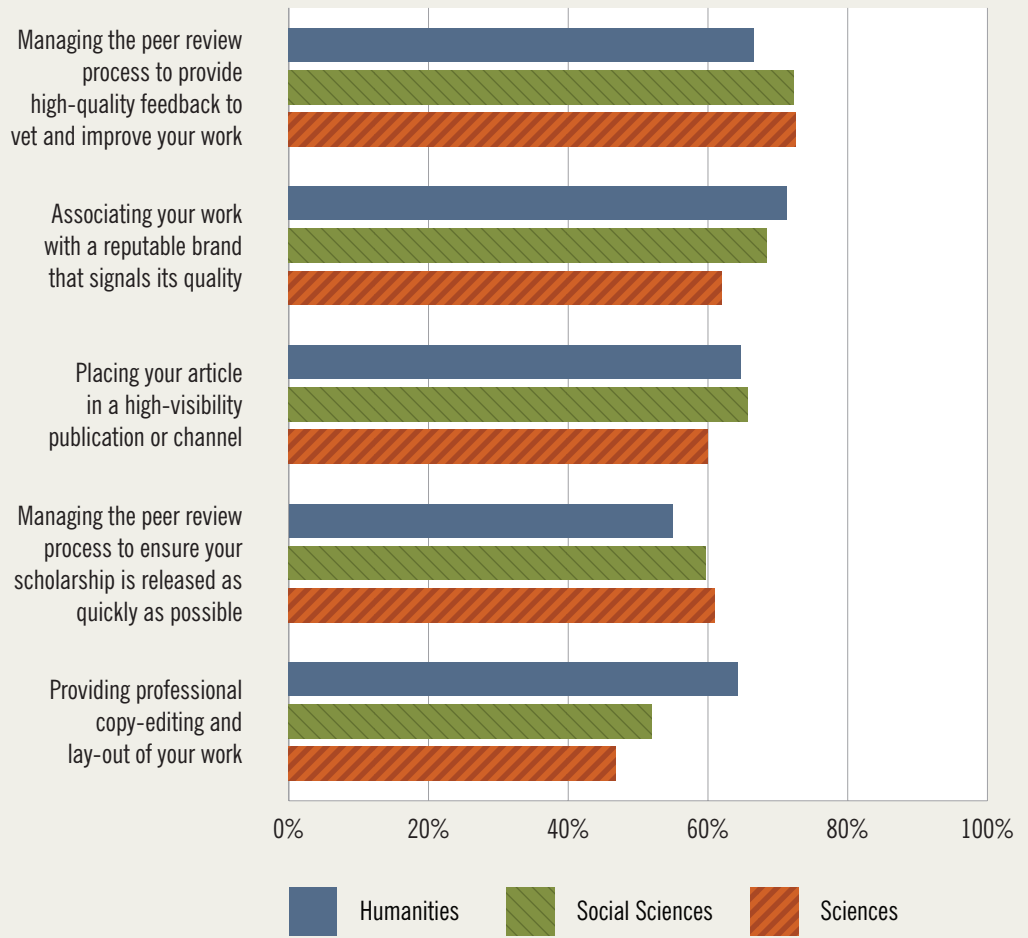
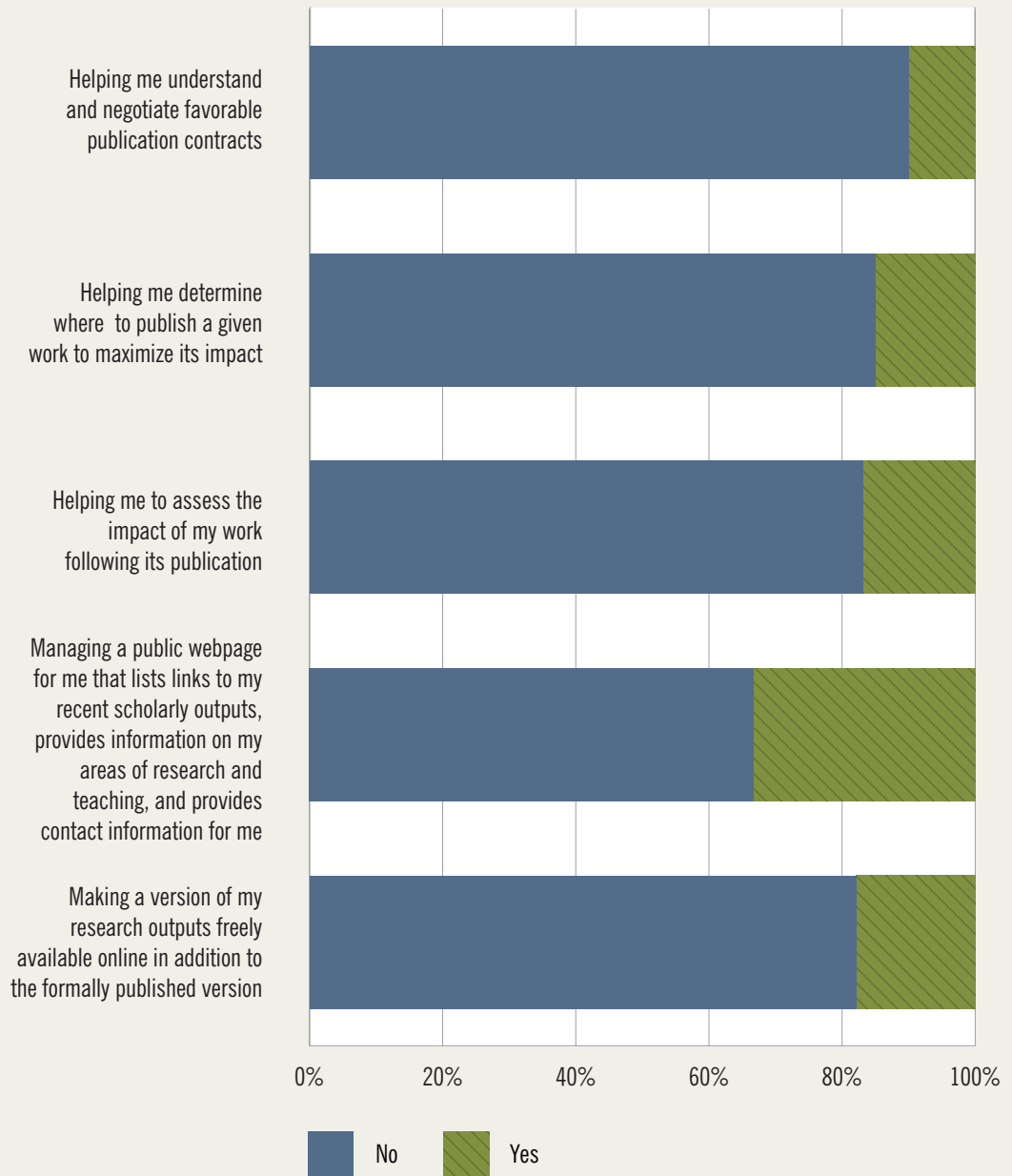


FIGURE 35

“Does your college or university library, scholarly society, university press, or another service provider assist you with any of the following aspects of the publication process?” Percent of respondents answering yes or no to each.



Respondents indicated that the services we asked about are not yet widespread (see Figure 35). A third of respondents indicated that they receive support in the form of having a public web presence managed for them, and smaller shares indicated that they receive assistance with other potential services, including help to understand and negotiate favorable publication contracts, help to determine where to publish to maximize impact, help to assess the impact of work following publication, and assistance in making a version of research outputs freely available online.

In addition to asking whether or not they receive these services, we asked faculty to rate how “valuable” each of these services would be to them, setting aside whether or not they already received them (see Figure 36). In general, only a small share of respondents feels strongly about any of these services, with around a quarter rating each one as very important. A slightly higher share of respondents is enthusiastic about services that make their research feely available online, although even here less than 2 out of 5 rated it highly important.

An area closely related to publishing that has been of particular interest to many in the scholarly community in recent years has been the preservation and sharing of research data, both to provide data sources for other types of analyses and to provide a mechanism for testing the reproducibility of results. National funding agencies have been leaders in this movement by requiring data management plans as a part of grant funding. This has led many universities to consider how they can best support scholars who are for the first time asked to consider the life of their data following the conclusion of their research. About four out of five respondents indicated that they build up some kind of collections of “scientific, qualitative, quantitative, or primary source research data.” But while scholars across disciplines build up collections of relevant research data—of whatever type may be appropriate for their field and research—in the course of their work, few turn to established solutions for preserving these materials after a given project ends (see Figure 37). Four out of five respondents strongly agreed that “I preserve these materials myself, using commercially or freely available software or services,” and just shy of 20% of respondents reported that they turn to “a repository made available by my institution or another type of online repository.” Smaller shares indicated that someone else—their campus library or a publisher—preserves these materials for them. If long-term data preservation is to become an important priority for the scholarly community, new solutions—or greater uptake of existing solutions—will be required to ensure that materials are preserved responsibly.³⁷

The role of the library

One of our longest-running areas of interest in the Faculty Survey has been exploring how the roles of the library have evolved. Early versions of this question focused on understanding how scholarly perceptions of the library’s

³⁷ In this question, and elsewhere in the survey, we did not address the potential role played by institutional IT offices. In future cycles, we hope to better explore the potential roles played by IT offices, although substantial differences between the structures and roles of these offices between institutions may make this difficult to assess.

FIGURE 36

“How valuable do you find support from your college or university library, scholarly society, university press, or another service provider for each of the following aspects of the publication process, or how valuable would you find it if this support was offered to you?” Percent of respondents who indicated that support for each of these aspects of the publication process is very important, by disciplinary grouping.

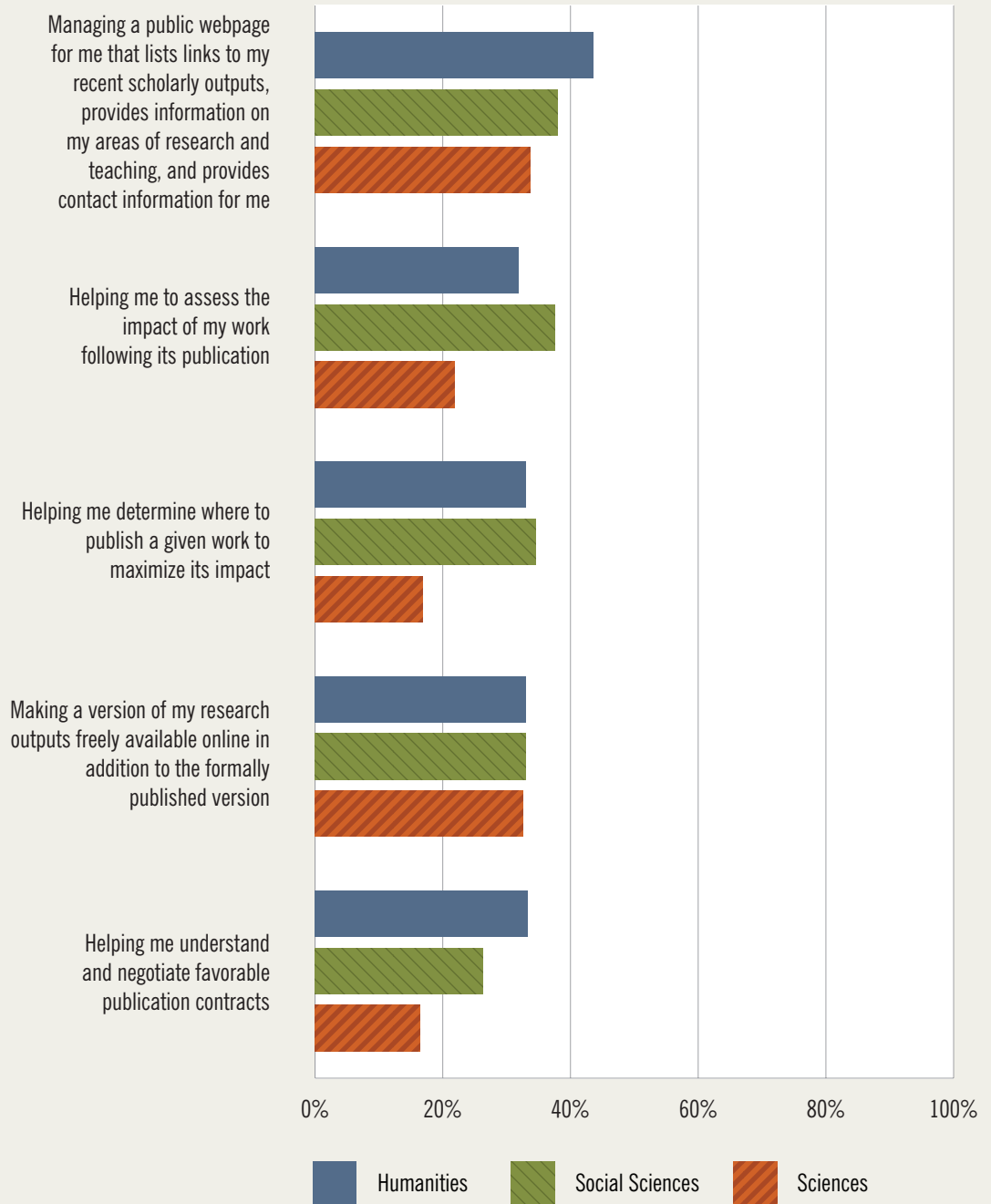
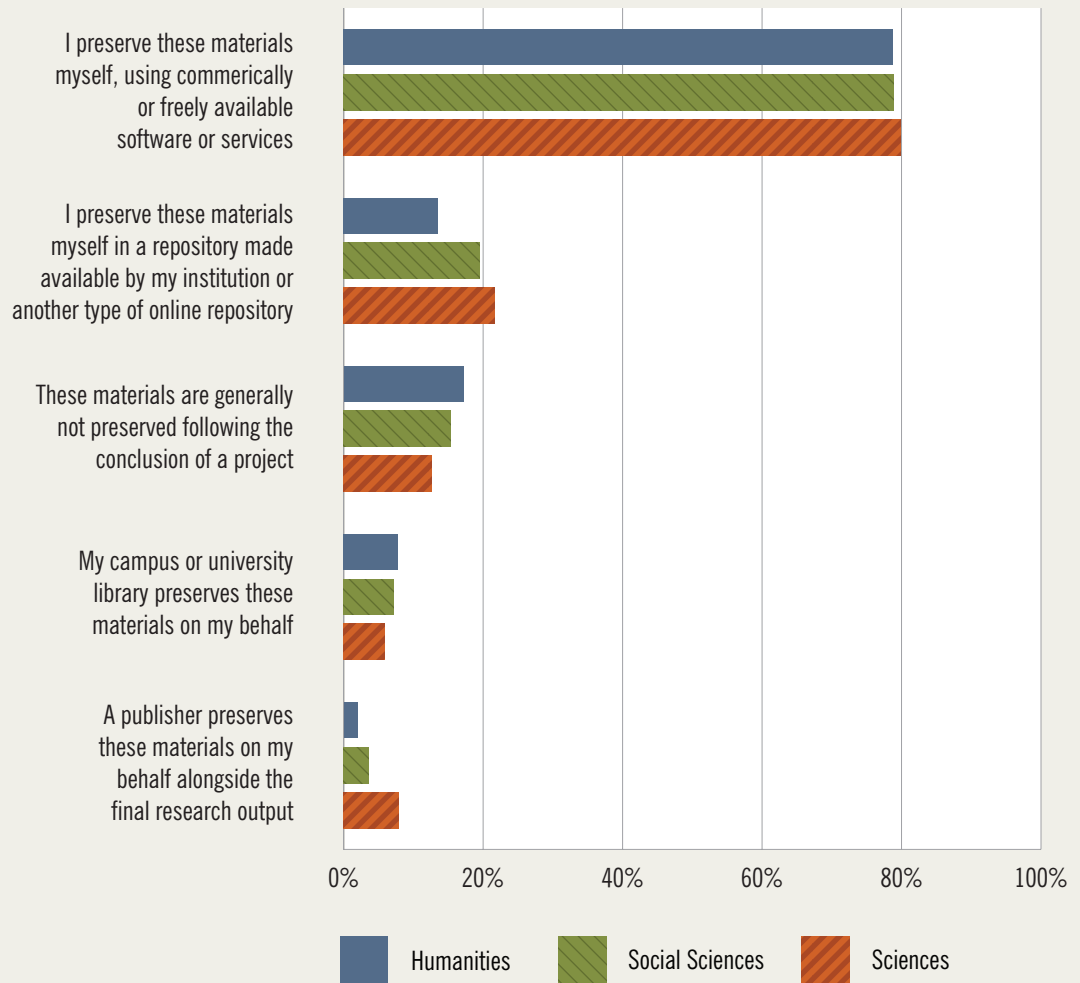


FIGURE 37

“In the course of your research, you may build collections of scientific, qualitative, quantitative, or primary source research data. If these collections of research data are preserved following the conclusion of the projects, what methods are used to preserve them?” Percent of respondents who indicated that they use each of these methods to preserve research data, by disciplinary grouping.



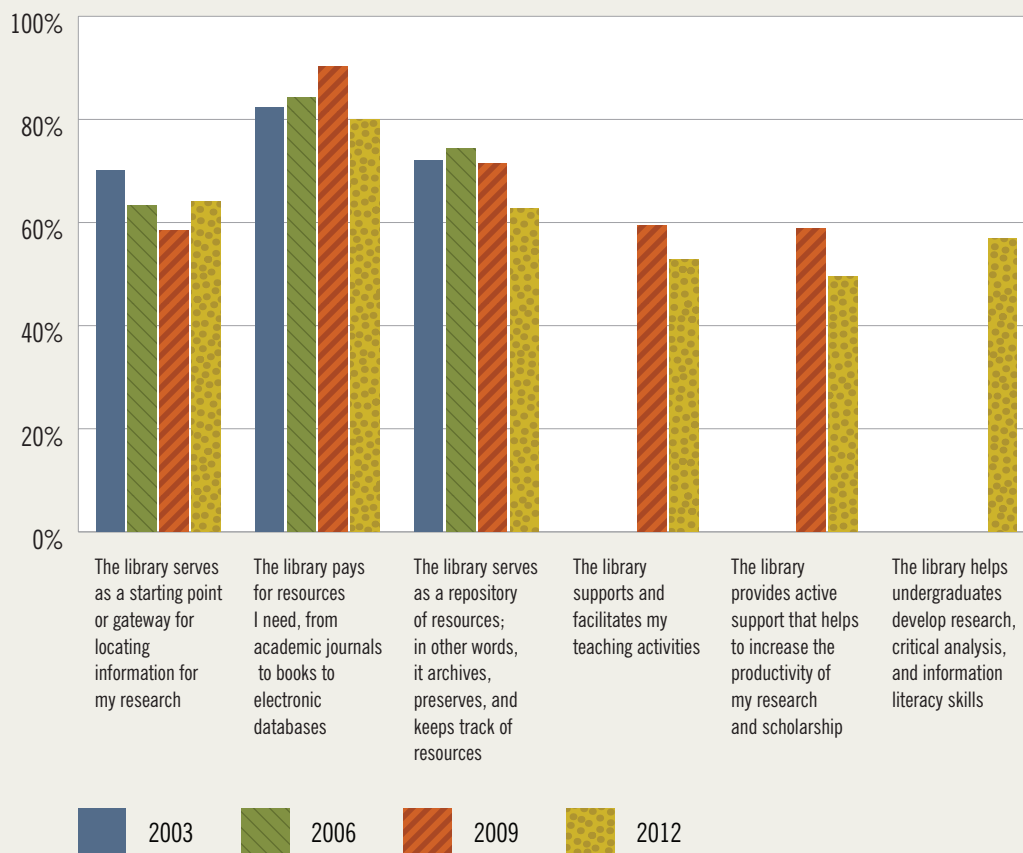
collections changed in light of scholars' increasing ability to disintermediate the library from their research. More recently, we have complemented our exploration of these collections roles with an interest in understanding how more service-oriented library roles are perceived by scholars. We asked respondents to rate "how important is it to you that your college or university library provides each of the functions below or serves in the capacity below" for each of a list of six roles. We recognize that this may not fully encompass all of the many roles that libraries play at their institution—for example, we do not address the role of the library as a space for student work—but we believe that these roles encompass many of the broad categories of faculty-facing roles played by the library. The below list presents these six roles, each identified by a shorthand name used in this document (but not presented in the survey) for convenience:

- Gateway: "The library serves as a starting point or "gateway" for locating information for my research"
- Buyer: "The library pays for resources I need, from academic journals to books to electronic databases"
- Archive: "The library serves as a repository of resources; in other words, it archives, preserves, and keeps track of resources"
- Teaching support: "The library supports and facilitates my teaching activities"
- Research support: "The library provides active support that helps to increase the productivity of my research and scholarship"
- Undergraduate support: "The library helps undergraduates develop research, critical analysis, and information literacy skills"

The first three roles—gateway, buyer, and archive—are each related to the library's collections, and track the perceived importance of building, maintaining, and facilitating access to library materials. We have asked about these collections-oriented roles since the 2003 cycle of the survey. The last three roles—teaching, research, and undergraduate support—are all more service-oriented roles that have been introduced into the questionnaire more recently; they chart the perceived importance of the library providing services in support of various faculty activities or campus priorities. Figure 38 presents overall responses across cycles of the Faculty Survey. The role that was rated as very important by the largest share of respondents in the current cycle of the survey was: "the library pays for resources I need, from academic journals to books to electronic databases." This has been the most highly rated role since the introduction of this question in 2003, typically by a substantial margin. In the current cycle, eight out of ten respondents indicated that this was a very important role, with a gap of more than fifteen percentage points between the share of respondents who indicated that this role is very important and the next role. Still, a slightly smaller share of respondents rated this role as very important in this cycle; in the 2009 cycle, over 90% of respondents rated this same role as very important. This is the first time that the share of respondents rating this role as very important has declined between cycles. This decline of about ten percentage points was consistent across major disciplinary groupings. The reasons for the reversal of this trend are not

FIGURE 38

“How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?” Percent rating each as very important, over time.



immediately clear; one possible explanation would be that as more materials are made freely available online, the library’s buyer role is viewed as less essential, but this is purely speculative. We will continue to track this point over time to assess if these findings represent the beginning of a new trend or a one-off aberration.

We also saw a change in direction over time for responses about another key library role, as a slightly larger share of respondents indicated that it was very important to them that “the library serves as a starting point or ‘gateway’ for locating information for my research.” In this cycle, slightly less than two-thirds of respondents rated this “gateway” role as very important, placing this as the second place role and marking the first time that the share of respondents rating this role as very important has increased since 2003. As with the library’s purchaser role, this increase occurred across major disciplinary groups.

The third role that we have tracked since 2003 asked respondents to rate how important it is to them that “the library serves as a repository of resources; in other words, it archives, preserves, and keeps track of resources.” The share of respondents who rated this role as very important also fell by about ten percent-

age points since the 2009 survey, which leaves the share of respondents rating this role as very important about the same as the share rating the “gateway” role as very important—slightly less than two thirds. The decline in the overall share of respondents who rated the archive role as very important was principally driven by a decline in the share of humanists and scientists who rated this role as very important, with the share of social scientists who rated this role as very important remaining about the same between cycles.

The relative importance of these three collections-oriented roles has fluctuated since the last cycle of the survey, with long-standing trends reversing direction in some cases. We will continue to track these roles, in order to understand if these are short-term fluctuations or the beginnings of new trends in attitudes about these roles. Some changes—such as the increase in the share of respondents rating the library’s “gateway” role as important—may be explained by pointing to the efforts libraries have made to facilitate discovery through library websites by investing in indexed discovery services or to raise awareness of the library’s role in providing access to online materials. Overall, the general pattern of responses remains the same, with these collections-oriented roles being among the most important roles of libraries, and with the role as a purchaser of needed materials remaining the most widely rated as important. It is possible that the evolution of this question over time as we have sought to test other roles in parallel to these—as discussed below—has changed response patterns somewhat, as scholars now must rate these three roles alongside several others.

Beginning with the 2009 cycle of the Faculty Survey, we introduced into this question some new roles to complement the collections-oriented roles discussed above, with an emphasis on understanding the comparative value of the service-oriented roles that the library plays. In 2009, we also asked respondents to rate how important it was to them that “the library supports and facilitates my teaching activities” and that “the library provides active support that helps to increase the productivity of my research and scholarship.” In 2009, both of these roles were rated as important by about 60% of respondents, and in this cycle, the share of respondents who rated each of these roles as very important fell slightly. These roles were rated as very important by a smaller share of respondents than any of the other roles we asked about. In each case, a substantially larger share of humanists rated these roles as very important than did scientists, with social scientists in between—about two thirds of humanists rated each role as very important, while less than 40% of scientists did so. Again, we will track the importance of these roles over time to see if they are on a declining trend or simply fluctuating.

Finally, we asked scholars to rate how important it was to them that “the library helps undergraduates develop research, critical analysis, and information literacy skills.” In the Ithaka S+R Library Survey 2010 of deans and directors, when this role was first introduced into this module, it was rated as very important by virtually all of the library leaders who responded.³⁸ Among faculty, however, only

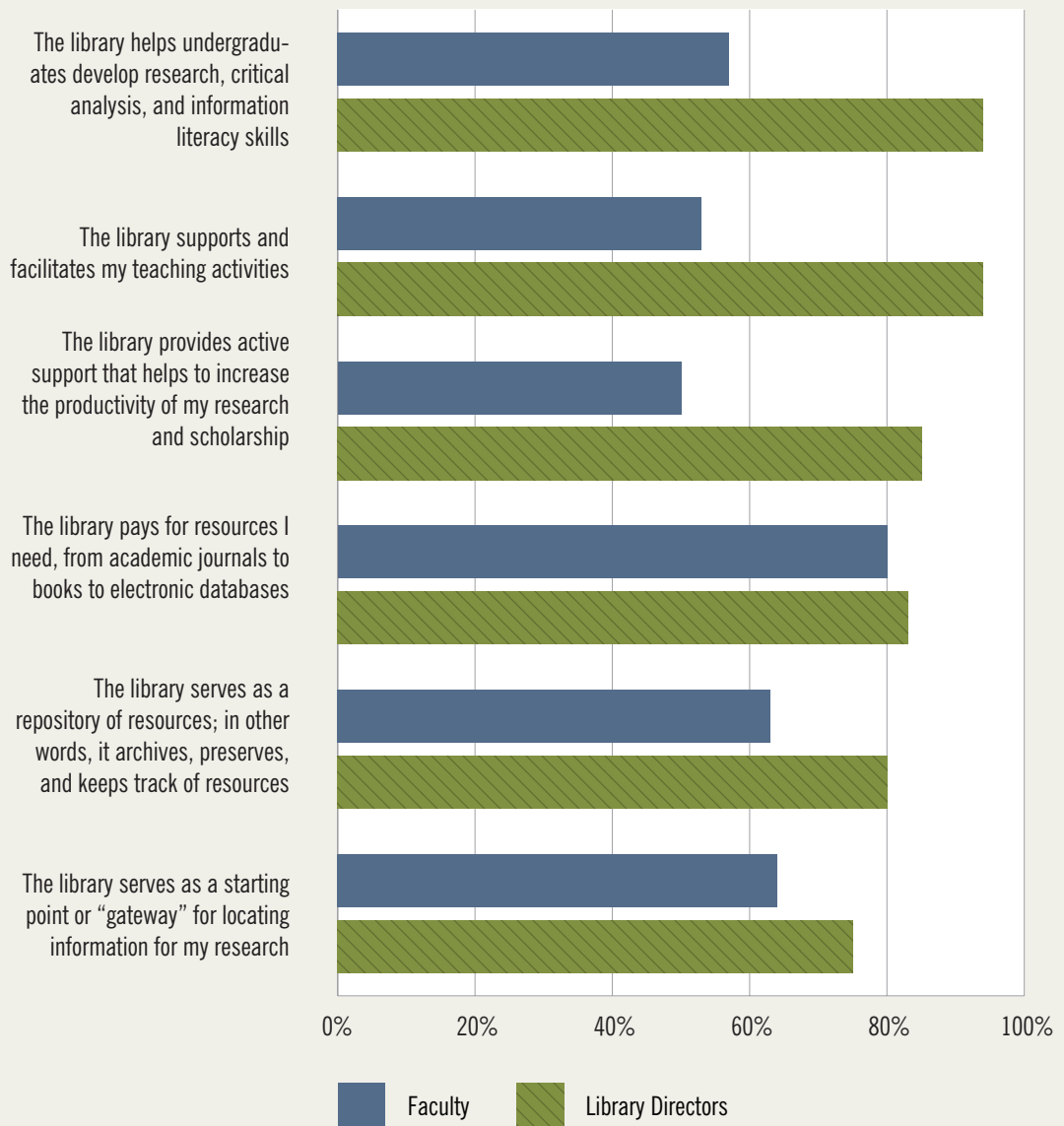
38 Matthew P. Long and Roger C. Schonfeld, *Library Survey 2010: Insights from U.S. Academic Library Directors* (New York: Ithaka S+R, 2011), available at <http://www.sr.ithaka.org/research-publications/library-survey-2010>, 12-16.

slightly over half rated this role as very important. This was the first time that we have asked faculty about this role of the library, and we will track their responses over time to see how attitudes evolve alongside library interest in serving this role.

In general, a substantially smaller share of faculty members rated each role as very important than did library deans and directors; the only role on which there was agreement was the library’s buyer role (See Figure 39).

FIGURE 39

“How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?” Percent rating each role as very important, comparing library deans and directors (Ithaka S+R Library Survey 2010) and faculty members (Ithaka S+R Faculty Survey 2012)



It is clear that the library's role as a purchaser is valued by the largest share of respondents, with the gateway and archival roles seeming to make up a second tier, and research, teaching, and undergraduate learning support rated as very important by a slightly smaller share of respondents. But this overall picture looks very different when considering responses at a disciplinary level (see Figure 40). Among humanists, the same pattern can be seen, but there is much less range between the most and least widely rated roles; all roles except for the research support role were rated as very important by more than two thirds of respondents. Among scientists, though, a very different pattern can be seen. While the share of scientists rating the library's purchaser role as very important is about the same as the share of humanists or social scientists doing so—roughly 80%—only just over half of scientists rated the gateway and archival role as very important, and even smaller shares rated other roles as very important. Although the purchaser role is relatively equally considered as very important across fields, other roles are substantially less widely agreed upon.

When comparing between different types of institutions, there are not clear patterns across the board, but some roles do show key distinctions between different types of institutions (see Figure 41). A relatively smaller share of respondents at baccalaureate-only institutions—institutions in the Carnegie Classifications of Baccalaureate Colleges—Arts & Sciences and Baccalaureate Colleges—Diverse Fields—rated the archive role as very important, while a relatively larger share of respondents at research universities—Carnegie Classifications of Research Universities (high research activity) and Research Universities (very high research activity)—rated this role as very important. On the other hand, relatively larger shares of respondents at the baccalaureate-only institutions rated the teaching and undergraduate support roles as very important, while relatively smaller shares of respondents at research universities rated these roles as very important.

In an effort to understand the vision that scholars have for the role of the library, we asked them how well they agreed with two descriptions of sets of potential “primary responsibilities” for their library: “the primary responsibility of my college or university library should be facilitating my access to any scholarly materials in print and digital form that I may need for my research and teaching,” and “the primary responsibility of my college or university library should be supporting undergraduate student learning by helping students to develop research skills and find, access, and make use of needed materials.” About half strongly agreed with each statement, which does not provide a clear steer for libraries in setting priorities between these roles (although they are not necessarily mutually exclusive). Respondents at different types of institutions, however, rated these roles very differently (see Figure 42). Large shares of scholars at smaller institutions agreed strongly that supporting undergraduates should be their library's primary role, and smaller shares of these scholars agreed strongly that facilitating their access to materials should be their library's primary role. At larger institutions, these patterns were reversed.

Despite substantial changes over time in the roles played and services offered by campus libraries, the share of faculty who describe themselves as very dependent on their library has remained basically constant—at roughly 40%—for each

FIGURE 40

“How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?” Percent rating each as very important, by disciplinary grouping.

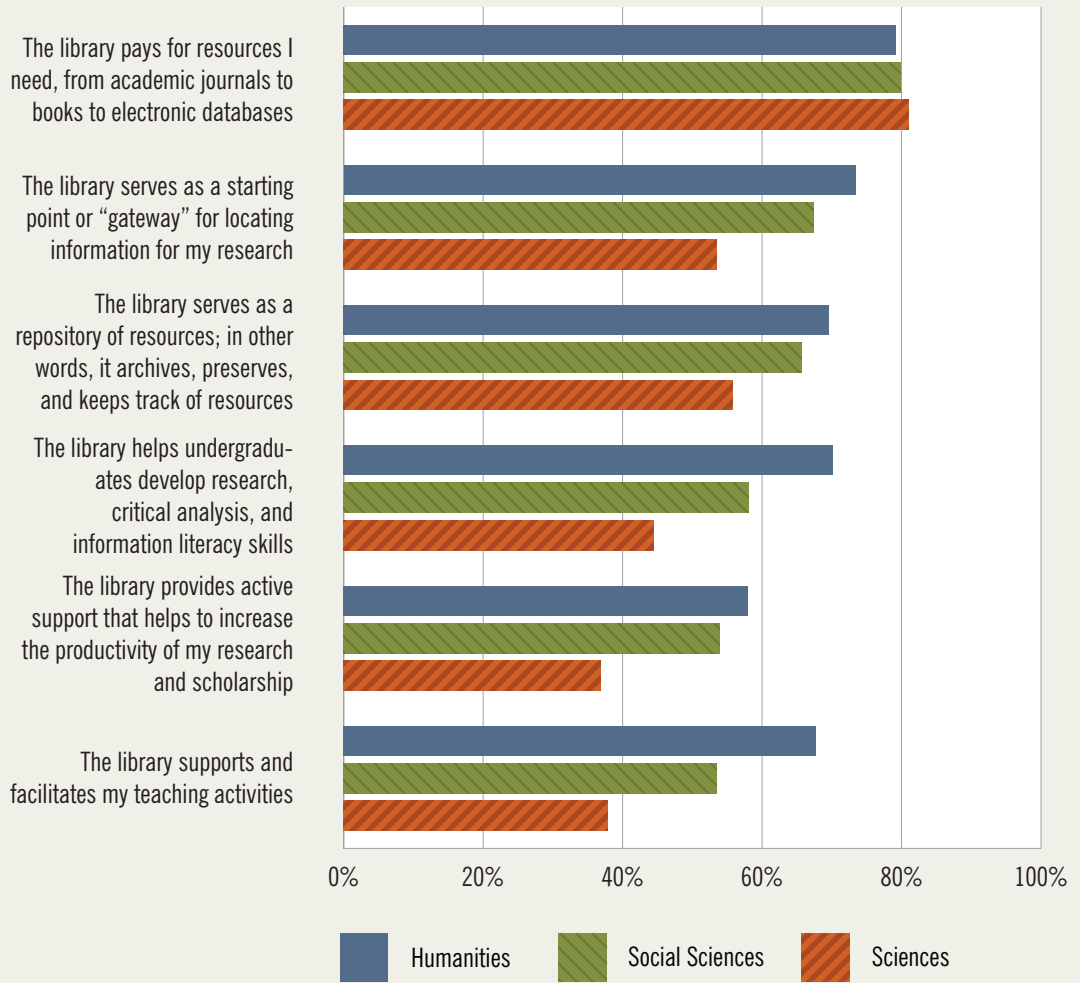


FIGURE 41

“How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?” Percent rating each as very important, by institution type.

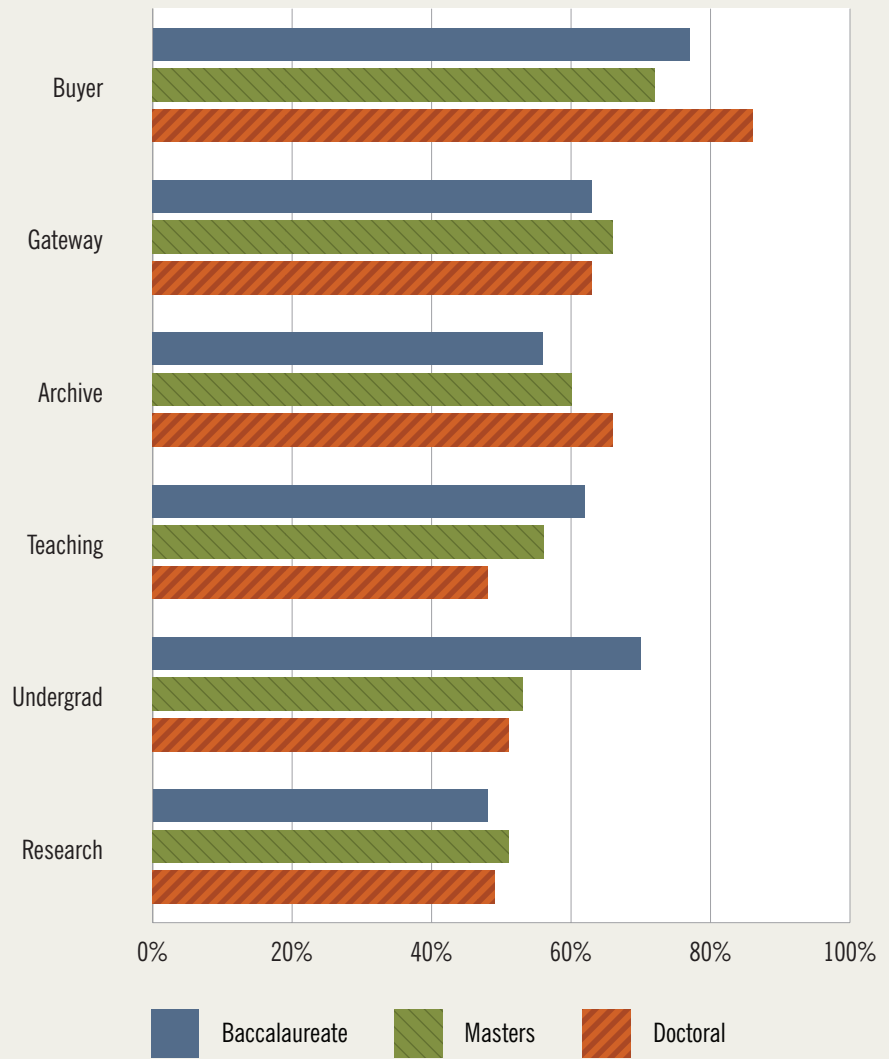
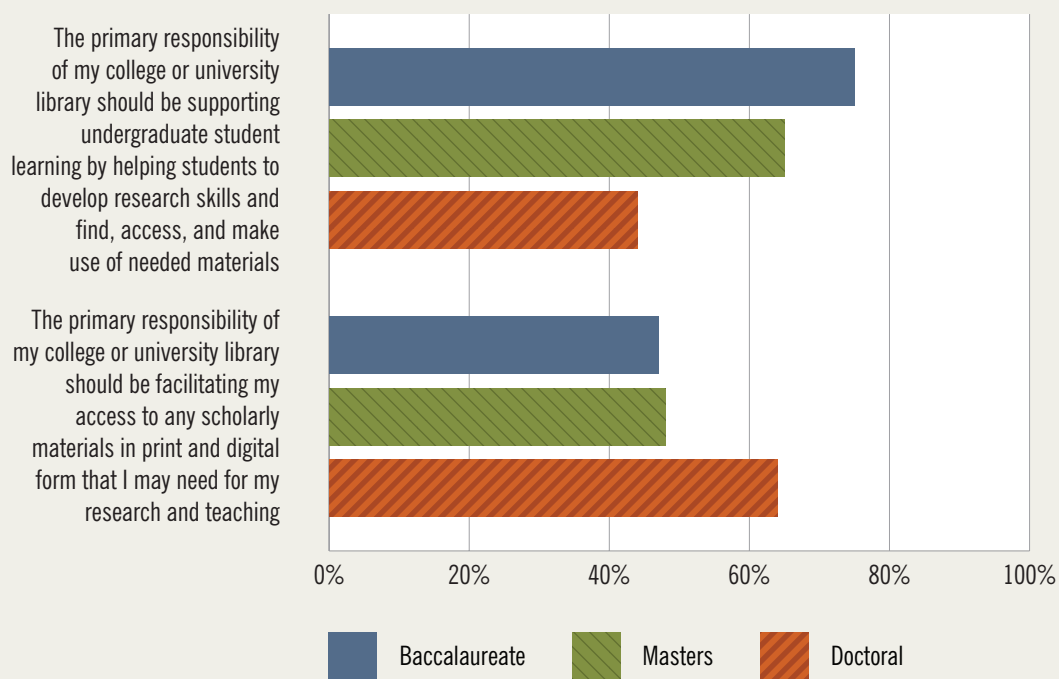


FIGURE 42

Percent of respondents agreeing strongly with each question, by institution type.



cycle of the survey since 2003 (see Figure 43). And although there are substantial differences between disciplines in the perceived importance of different library roles, the share of respondents who described themselves as very dependent on their library is roughly the same across fields.

Although this number has remained constant, a growing minority of respondents agreed strongly with statements about the declining relative value of the library. Although roughly half of respondents strongly disagreed with each of these statements, about 20% of respondents agreed strongly with each of the statements “because faculty have easy access to academic content online, the role librarians play at this institution is becoming much less important” and “because scholarly material is available electronically, colleges and universities should redirect the money spent on library buildings and staff to other needs” (see Figure 44). Although still small, the share of respondents who agreed strongly with these statements has grown substantially in this cycle of the survey. These responses do vary somewhat by discipline; smaller shares of humanists agreed with each, but over 25% of scientists agreed strongly that the role played by librarians is becoming much less important.

Taken together, these findings indicate that with the exception of their efforts regarding discovery, academic libraries have faced headwinds regarding their other roles over the past three years. In all cases except for the gateway role, where there was a slight increase, the share of respondents rating each role of the library as very important has declined since 2009. And although the share of

FIGURE 43

“How dependent would you say you are on your college or university library for research you conduct?”
Percent indicating that they are very dependent, over time.

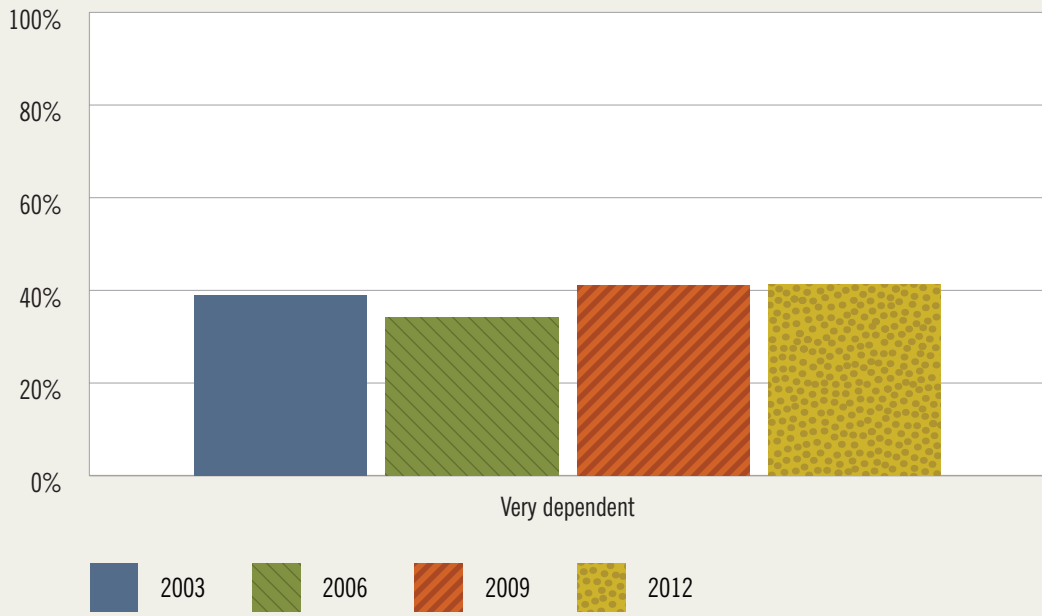
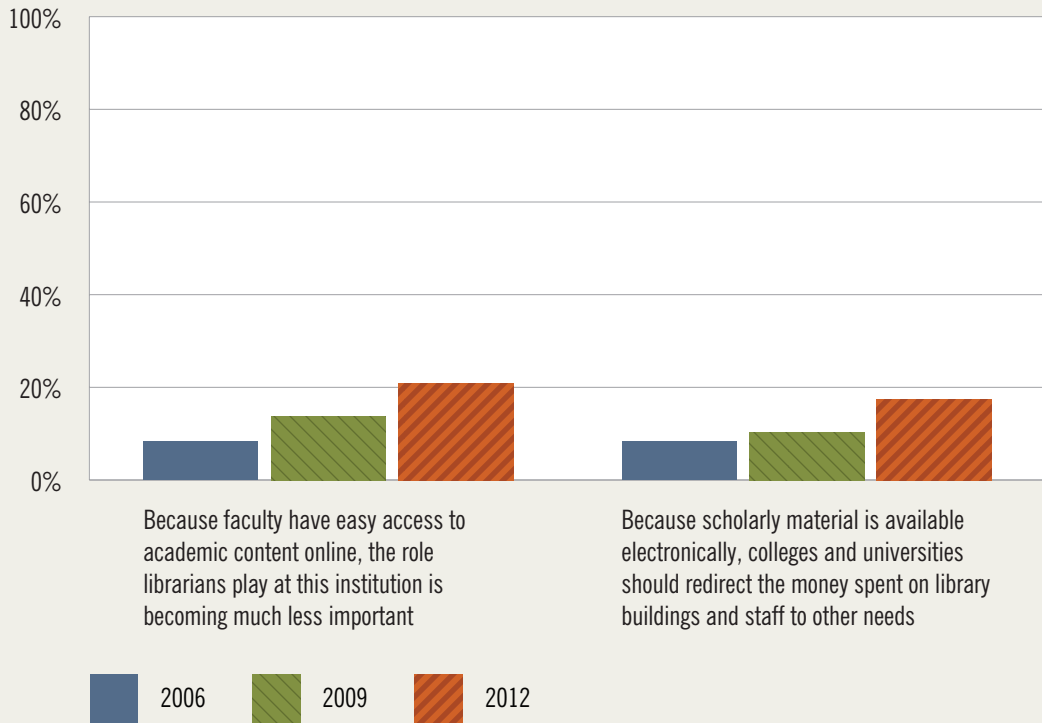


FIGURE 44

Percent of respondents agreeing strongly with each statement, over time.



respondents who agreed strongly with statements about their institutions redirecting money away from the library or about the diminishing role of librarians remains small, it has continued to grow over time.

The role of the scholarly society

In addition to recorded publications, scholars also communicate with each other in a variety of other formal and informal ways. Although the scholarly society is a traditional hub for scholars to communicate with each other through conferences and other media, online communications offer a variety of new opportunities for scholars to engage with each other, which could potentially disrupt the importance of a single national disciplinary organization and conference for supporting scholars' engagement with each other.³⁹ But our respondents largely indicated that they continue to value their scholarly societies' role in particular as a convener of conferences.

Over three-quarters of respondents said they are a member of the primary scholarly society in their field, and over half are members of additional scholarly societies, including either a society focusing on their particular area of research interest or organized for the geographical region in which they live and work. Only 1 out of 10 respondents said they did not belong to any scholarly society at all. About 3 out of five indicated that the primary society for their field was the most important to them, and the remaining respondents virtually all indicated that a society focusing on their particular area of research interest was the most important.

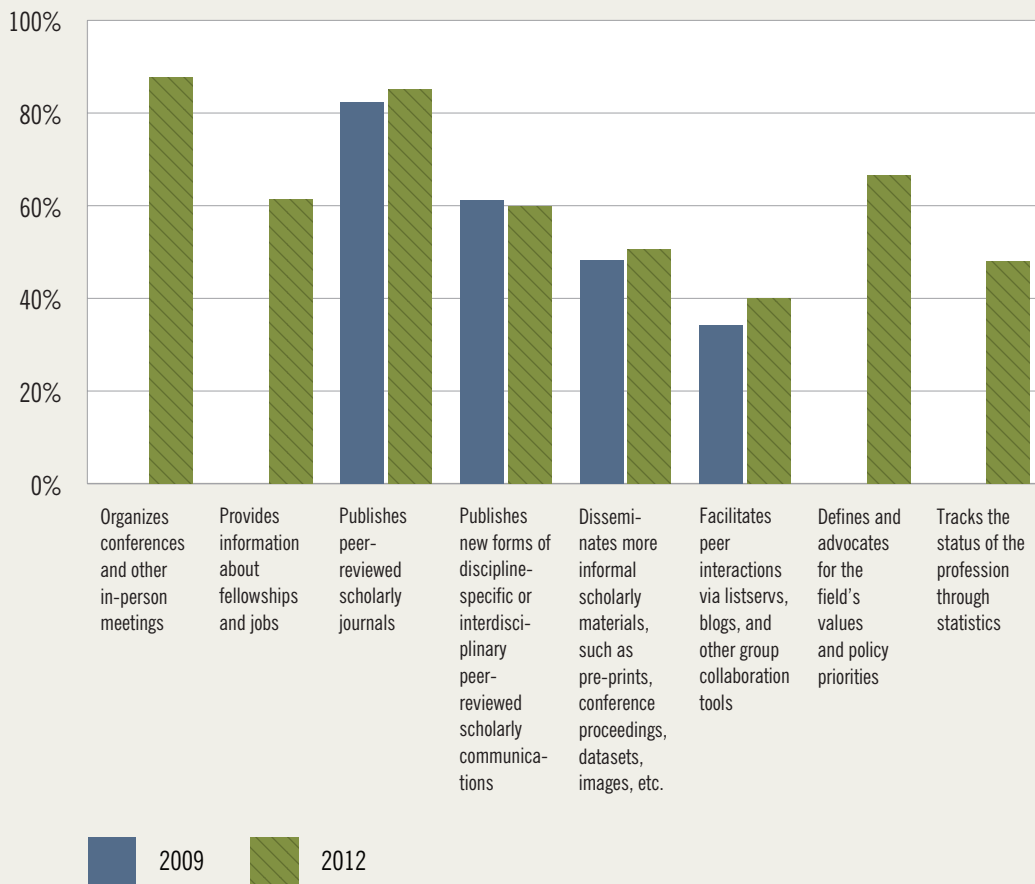
When asked about the importance of the various roles that the primary society in their field plays (see Figure 45), almost all respondents indicated that organizing conferences and publishing peer-reviewed scholarly journals were very important. About three out of five respondents indicated that they also find their society's roles in providing information about fellowships or jobs, publishing new forms of discipline-specific or interdisciplinary peer-reviewed scholarly communications, and defining and advocating for the field's values and policy priorities to be very important. Other roles—disseminating informal scholarly materials, tracking the status of the field through statistics, and facilitating online peer interactions—received a slightly smaller share of responses, but were still rated as very important by 40 to 50% of respondents.

While conferences were widely cited by scholars as an essential role of their scholarly societies, the academic conference consists of a variety of different activities, ranging from formal sessions on academic research to practical workshops on methods and pedagogies to casual drinks with colleagues. When scholars consider the academic conference, how significant are these various activities to them? Virtually all respondents agreed that hearing about new research is a very important conference activity for them, but two-thirds to three-quarters

39 Kaustuv Basu, "To Be or Not to Be?" Inside Higher Ed, February 6, 2012, <http://www.insidehighered.com/news/2012/02/06/making-case-dissolving-american-philosophical-association>; Steven Wiley, "To Join or Not to Join," The Scientist, March 1, 2010, <http://www.the-scientist.com/?articles.view/articleNo/28804/title/To-Join-or-Not-to-Join/>.

FIGURE 45

“How important is it to you that the primary scholarly society for your field or discipline provides each of the functions below or serves in the capacity listed below?” Percent of respondents who indicated that each of these functions is very important.

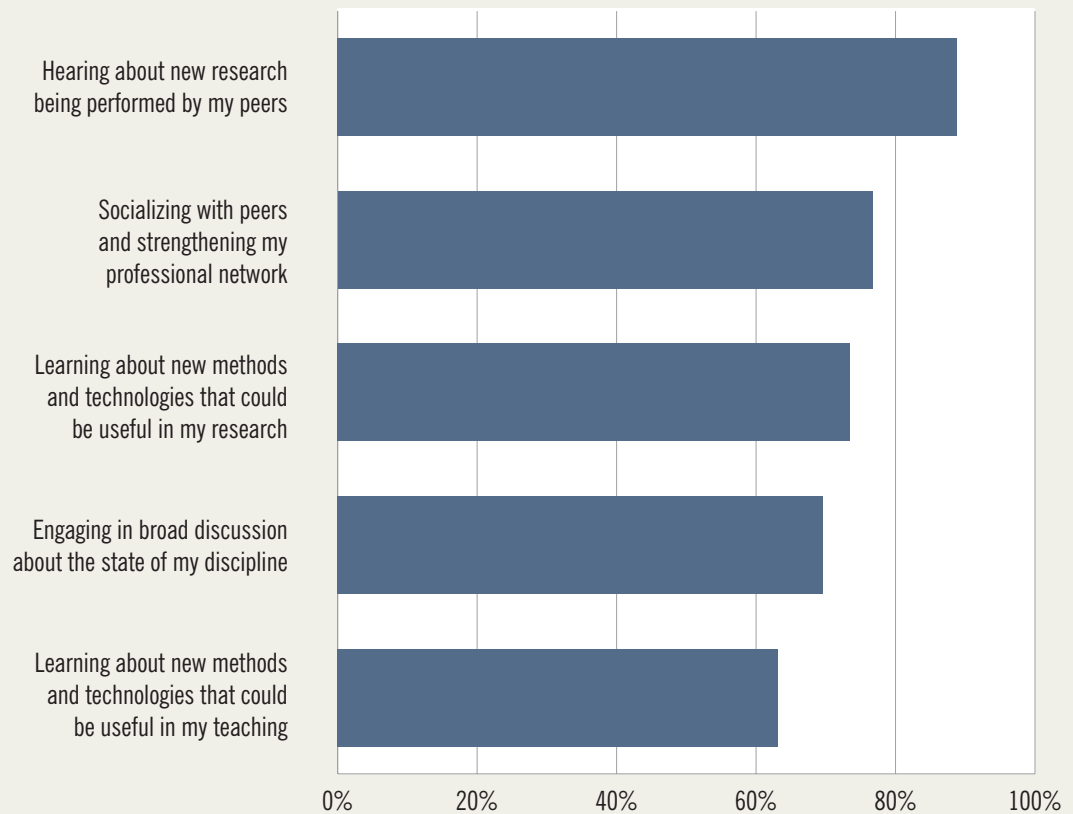


also agreed that other activities—socializing with peers, learning about new methods and technologies for research and teaching, and engaging in broad discussion about the state of their discipline—were very important (see Figure 46).

For the most part, respondents indicated that they would like to attend more conferences, which is consistent with the very high share of faculty members that value conferences as a means of maintaining current awareness (see the Discovery section above). About half of respondents strongly disagreed with the statement “I do not feel the need to engage more with my scholarly peers at academic conferences.” Funds seem to be a tighter constraint than time; roughly 60% of respondents indicated that they don’t have the funds to attend more conferences, while about 40% indicated that they do not have the time to attend more conferences.

FIGURE 46

“When you think about attending an academic conference, how important is each of the following conference activities to you?” Percent of respondents who indicated that each of these activities is very important.



Summary of key findings

The Faculty Survey covers a wide terrain in terms of thematic scope, and the demographics we gather provide for a variety of analyses. In this report, we have sought to provide some of the main findings from the survey this cycle. In this section, for the convenience of the reader, we provide a summary of key findings distilled from the report:

- The role of internet search engines in facilitating discovery of scholarly resources has continued to increase. The perceived decline in the role of the library catalog noted in previous cycles of this survey has been arrested and even modestly reversed, driven perhaps to some degree by significant strategic shifts in library discovery tools and services.
- Respondents are generally satisfied with their ability to access the scholarly literature, not least because freely available materials have come to play a significant role in meeting their needs.

- While respondents continued to trend overall towards greater acceptance of a print to electronic transition for scholarly journals, they grew modestly less comfortable with replacing print subscriptions with electronic access. Monographs, although widely used in electronic form, present a mixed picture for any possible format transition. While some monograph use cases are quite strong for electronic versions, others - especially long-form reading - are seen to favor print by a decisive share. Even so, a growing share of respondents expects substantial change in library collecting practices for monographs in the next five years.
- Respondents' personal interests are the primary factor in selecting research topics, but junior faculty members report that tenure considerations play an important role, as well. Collaboration models vary significantly across scholarly fields. While humanists are less likely than scientists or social scientists to conduct quantitative analyses, nevertheless some 25% of humanists report gathering their own data for this purpose.
- Small but non-trivial shares of respondents use technology in their undergraduate teaching. But while most recognize the availability of resources to help them do so, many respondents do not draw upon resources beyond their own ideas or feel strongly motivated to seek out opportunities to use more technology in their teaching.
- Respondents tend to value established scholarly dissemination methods, prioritizing audiences in their sub-discipline and discipline, and those of lay professionals, more so than undergraduates or the general public. Similarly, they continue to select journals in which to publish based on characteristics such as topical coverage, readership, and impact factor. Finally, respondents tend to value existing publisher services, such as peer review, branding, and copy-editing, while expressing less widespread agreement about the value of newer dissemination support services offered by libraries that are intended to maximize access and impact.
- Respondents perceive less value from many functions of the academic library than they did in the last cycle of this survey. One notable exception is the gateway function, which experienced a modest resurgence in perceived value. A minority of respondents sees the library as primarily responsible for teaching research skills to undergraduates. And, though still a clear minority, the share of respondents who wish to see substantial change to library staff and buildings has increased. There are large differences in perceptions between disciplinary groups: a smaller share of scientists views many library roles as very important.
- Conferences remain at the heart of respondents' perceptions of the role and value of the scholarly societies in which they participate. Conferences are valued for both the formal function of discovering new scholarship and informal role of connecting scholars with peers.

We hope that the findings from Ithaka S+R's Faculty Survey US 2012 help to inform the higher education sector on key strategic issues that it faces today and look forward to community discussion about their implications.