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# Ithaka S+R | Jisc | RLUK UK Survey of Academics 2012

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**RLUK** Research Libraries UK

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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Research Libraries UK (RLUK) is a consortium of 33 of the UK and Ireland's leading research libraries. Our mission is to work with our members and with our partners, nationally and internationally, to shape and to realise the vision of the modern research library (<http://www.rluk.ac.uk/>).

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## Preface

Scholarly communications is changing, and changing rapidly. Technological developments have expanded the potential range of dissemination of research and the delivery mechanisms, with researchers expecting any-time, anywhere access. Technology also allows for an expansion of the types of material that can be readily shared—not just articles and monographs, but datasets and software. Policy developments are increasingly focussing on issues surrounding openness, wider public engagement and impact. Funders worldwide are looking to maximise the investment they make in research and are expressing views on how research outputs are shared. The sociology of scholarly communication is also changing. While the importance of ‘formal’ communication through journal articles and monographs is undimmed, there is an increasing use of ‘informal’ channels with ever greater traffic through blogs, wikis, Twitter and even press releases.

These changes affect all aspects of scholarly communications: how researchers discover and retrieve information, how they assign value and trust to the channels by which they gain access, how they view the intermediaries between author and reader (whether publisher, library or others), the value associated with peer review and the acceptance, or otherwise of pre-peer reviewed material, etc. This in turn affects all the players within scholarly communications from funders and researcher as authors, through publishers, libraries and infrastructure providers, to the researcher as reader.

Alongside this, similar changes are occurring in learning and teaching, and digital technologies offer new ways to engage students and to support teaching. These are having far reaching impacts on the way courses are provided and the way in which lecturers and students interact. For example there are now on-line systems to support course delivery and assessment, materials and courses are now available as open educational resources, and instructors are integrating blogs, digital simulations and video. In a similar way to research we are witnessing policies that are encouraging on-line learning and openness, with in some instances the provision of massive open online courses (MOOCs).

However, despite this rapid pace of change, there are a number of more traditional elements that remain critically important. As noted, the journal, monograph and textbook are still very much relevant and practices will continue to be a mixture of virtual and physical. Understanding the practices and views of academics, and how they are supported, is essential so universities, service providers and policy makers can meet their needs and seek to address gaps.

Over the past two decades, Jisc and RLUK have worked to respond to the changing needs of academics as they interact with the shifting scholarly communications and learning landscape. Sometimes we have reacted to changes, at other times we have proactively sought to create positive change. In all cases the aim has been to best serve the UK research and education community. Over the years we have looked with increasing envy at the invaluable resource provided in the United States by the Ithaka S+R Faculty Survey programme. By repeating the survey

every few years since 2000, Ithaka S+R has created a powerful evidence-base on which policy makers, funders, and librarians can base decisions for priorities for the future.

We are therefore very excited to have been able to partner with Ithaka S+R in adapting their survey for use in the UK. While the findings of the survey are extraordinarily valuable in themselves, their value will be increased by tracking changes over time, as well as allowing us to compare the UK and US environments. We are very grateful to Roger Schonfeld and his colleagues at Ithaka S+R who ran the survey and performed the analysis, and also to our colleagues in the UK who helped adapt the survey to make it suitable for a UK audience.

Rachel Bruce, Jisc

David Prosser, Research Libraries UK

## Executive summary

In 2012, Ithaka S+R partnered with Jisc and Research Libraries UK (RLUK) to survey academics in the UK higher education sector in order to learn about their attitudes and practices related to research, teaching, and communicating. In addition to the findings reported here, this project will provide a national dataset that can be analyzed by discipline, institution type, and other demographic characteristics, compared with findings from a parallel US-based project, and tracked for changes over time.

## Key findings

- Discovery starting points differ noticeably by disciplinary grouping; for example, medical and veterinary respondents are more likely to start with electronic research resources and less likely to utilize web search compared with others. While peers are not a significant discovery source for several types of research, they are very important for maintaining current awareness of the scholarly literature.
- Large majorities of scientists and medical and veterinary respondents are comfortable with the transition to electronic-only publishing and collecting for journal current issues, and majorities are comfortable with the deaccessioning of journal backfiles. Six out of 10 respondents overall reports having used a scholarly monograph in digital form in the past six months, but while significant shares like e-books for exploratory uses a majority prefers print for in-depth reading.
- Freely available materials are seen to be having a real impact on access. Academic libraries collections are most likely to be seen as an important source for providing journal articles and books for research and teaching purposes, but following closely in second place are freely available materials online. When an item is not held in the library collection, the highest share of respondents report that they look for a freely available version online, while the second highest share gives up, both of which outrank using the library's inter-lending or document supply service. Disciplinary groupings differ noticeably in several cases in their access practices. Overall, a third of respondents report that they can almost always get satisfactory access to needed journal articles not immediately available through their institution.
- In selecting areas of research to pursue, nearly all of our respondents indicated that they are guided primarily by their own personal interests, though many also consider the availability of funding or opportunities to publish.
- Virtually all respondents indicated that it is very important to them that their research reaches academics in their own subdiscipline or field of research, about 4 out of 5 identified academics in their broader discipline as an important audience, and over half ranked "professionals in my field outside academia" as a very important audience. Beyond these core audiences, a relatively small share of respondents identified the general public as a key audience, with especially few scientists doing so.

- Academics' audience prioritization is clearly reflected in choices they make regarding the publication of their work, where traditional measures of influence are most important in selecting where to publish their articles.
- Overall, about 45% of respondents indicated that they would describe themselves as very dependent on their college or university library for the research they conduct. Almost all respondents rate the library's role as a purchaser of needed resources as very important, while other roles are less universally indicated as important.
- Learned societies are valued primarily for organizing conferences, publishing peer-reviewed academic journals, and defining and advocating for the field's values and policy priorities. Conferences are valued for their formal function of helping academics keep up with new scholarship, and the informal role of connecting academics with peers.

## Introduction

The UK Survey of Academics 2012, conducted by the partnership of Ithaka S+R, Jisc, and Research Libraries UK (RLUK), examines the attitudes and behaviours of academics at higher education institutions across the United Kingdom. Our objective is to provide the entire sector, including universities, learned societies, scholarly publishers, and especially academic libraries, with timely findings and analysis that help develop plans for the future.

The Survey of Academics features broad coverage of the population of academics across the UK, as well as the ability to provide disciplinary and institutional type stratifications, offering an unusual depth of analysis. The survey was designed to establish benchmarks on a variety of key issues, the analysis of which will grow even more powerful if tracked over time in future survey cycles, should levels of interest justify doing so.

Thematically, the Survey of Academics covers resource discovery and current awareness, library collections and content access, the print to electronic format transitions, academic research methods and practices, undergraduate instruction, publishing and research dissemination, the role and value of the academic library, and the role of the learned society.

As an attitudinal survey, the data gathered and findings reported offer a broad national snapshot into the practices and needs of academics. We hope that, read in conjunction with national policy, university strategy, and institutional data, our findings will help to inform innovation, adaptation, and collective action.

## Methodology

The Survey of Academics builds on Ithaka S+R's long-standing Faculty Survey programme, through which we have surveyed academics in the United States since the year 2000. The UK Survey of Academics 2012 was conducted in parallel with the 2012 cycle of the Ithaka S+R US Faculty Survey 2012,<sup>1</sup> with only minor differences between questionnaires. This report focuses exclusively on the findings of the UK Survey of Academics 2012, without reference to the findings of the US Faculty Survey 2012. We plan to release an Ithaka S+R Issue Brief in the summer of 2013 that will compare and contrast key findings between the UK and US surveys, and both datasets are in the process of being deposited with ICPSR for preservation and access.<sup>2</sup>

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- 1 The full findings of the US-based Ithaka S+R Faculty Survey can be found in Ross Housewright, Roger C. Schonfeld, and Kate Wulfson, *US Faculty Survey 2012* (New York: Ithaka S+R, 2013), available at <http://www.sr.ithaka.org/research-publications/us-faculty-survey-2012>.
  - 2 The datasets will be part of ICPSR's "Ithaka S+R Surveys of Higher Education Series," available at <http://www.icpsr.umich.edu/icpsrweb/ICPSR/series/226>.



## Population, sample, recruitment, and response

The population for this survey was academic staff at UK higher education institutions. To create our sample, we used a database of UK academics' contact information maintained by A-mail Academic, a UK-based marketing names list vendor.<sup>3</sup> We inspected the A-mail Academic database, determining that it contains a sub-set, but a large one, of the UK higher education academic staff, seemingly broadly representative of the overall national population.

Within the total population of academics for whom A-mail could provide email contact information, we included all of those who were:

- Academic staff, defined as those listed within A-mail's database with the ranks of "Head of Department/Faculty," "Professor," "Lecturer," "Associate Professor," "Director," "Researcher," and "Reader"; and
- In the UK HE sector, defined as the HE institutions funded by HEFCE, HEFCW, SFC, as well as Queen's University Belfast and University of Ulster in Northern Ireland.

We elected to sample all individuals falling into the established population criteria at a 100% rate, for a sample size of 45,809.

Survey invitations were sent to this group of academics during the week of November 26, 2012. A reminder email was sent one week later to all of those who had not yet completed the survey. Invitations and reminders were sent under the names of Rachel Bruce (Innovation Director, Digital Infrastructure, Jisc) and David Prosser (Executive Director, RLUK).

The survey was closed on January 23, 2013, although the vast majority of responses were received within the first month following the initial invitations. In total, we received 3,498 responses, for a response rate of roughly 7.9%.

## Demographics and stratification

Respondents were asked a variety of demographic questions, some of which we use for segmentation purposes in this report. For example, respondents were asked for their discipline or field of study, and they were able to select multiple disciplines or fields as appropriate. In the analysis that follows, we regularly segment responses into the disciplinary groupings of arts and humanities, social sciences, sciences, and medical/veterinary fields, aggregating them based on their response to the demographic question. Even so, the underlying dataset permits individual discipline-level analysis in many fields where we received a sufficient number of responses, and we would encourage those interested in individual discipline-level findings to consult the underlying data.

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3 A-mail was the only vendor we could identify that is able to provide contact information for scholars on a sufficiently large scale to support this type of survey.

Based on self-reported disciplinary affiliations, our respondent population broke down as follows: <sup>4</sup>

- Arts and Humanities<sup>5</sup>: 1,189
- Social Sciences<sup>6</sup>: 1,545
- Sciences<sup>7</sup>: 1,464
- Medical/Veterinary<sup>8</sup>: 588

These response levels roughly correlate with the breakdown of these fields across A-mail’s database, although the arts & humanities are slightly overrepresented and the medical/veterinary fields are slightly underrepresented.

In our analysis, we occasionally stratify findings based on whether respondents are affiliated with RLUK members’ institutions or other HE institutions in the UK. RLUK academic membership is roughly equivalent to that of the Russell Group, although there are three differences.<sup>9</sup> Although not a perfect delineator, this segmentation allows us to compare academics at relatively more and less research-intensive institutions. Overall, 49% of our responses came from academics at RLUK institutions, and the remaining 51% were from academics at non-RLUK institutions. There are some important disciplinary differences between respondents at these institution types—a substantially larger share of respondents at RLUK institutions self-identified as scientists, while a relatively larger share of respondents at non-RLUK institutions self-identified as social scientists.<sup>10</sup>

Disciplinary groupings at RLUK and Non-RLUK institutions		
	RLUK institutions	Non-RLUK institutions
Arts and Humanities	35%	33%
Social Sciences	34%	54%
Sciences	50%	34%
Medical/Veterinary	19%	15%

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

5 Arts and Humanities includes Art History, English Studies, Fine Arts, History, Language & Literature, Linguistics, Music, Performing Arts, Philosophy & Religious Studies, and Visual Arts & Design.

6 Social Sciences includes Anthropology/Archaeology, Built Environment/Architecture, Business Management/Finance, Economics, Education, Geography, Law, Media & Communications Studies, Political Sciences, Psychology, and Sociology & Social Studies.

7 Sciences includes Applied Science Research, Agriculture / Food Science, Biochemistry, Biological Sciences / Ecology / Zoology, Chemistry, Computing & Information Science, Electrical & Electronic Engineering, Engineering Science, Environmental Sciences, Geology & Earth Sciences, Materials Sciences, Mathematics & Statistics, and Physics.

8 Medical / Veterinary includes Anatomy & Physiology, Dental Sciences, Health/Health Related Sciences, Medicine & Nursing, Pharmacy & Pharmacology, Psychiatry, and Veterinary Sciences.

9 RLUK is a consortium of institutions with a mission to support research libraries in the UK and Ireland and one of the partners on this project. Only UK HE members of RLUK are included in the survey; because they do not have academic staff, national and museum libraries are not reflected in this analysis. Two UK HE members of the RLUK do not belong to the Russell Group: University of Aberdeen and SOAS. Although a member of the Russell Group, Queen Mary, University of London does not belong to RLUK.

10 As respondents were able to select multiple fields, figures total to more than 100%.

In addition to these disciplinary differences, academics at RLUK institutions and non-RLUK institutions placed different weight on their roles as researchers and teachers; among academics at RLUK institutions, about three out of five respondents described themselves as more of a researcher than a teacher, while a smaller share—about 40%—of respondents at non-RLUK institutions described themselves in this way. Throughout this report, we focus on points where attitudes and practices reported by academics at these types of institutions differ, but we do not explicitly highlight points where attitudes and practices at both institution types are similar.

## Question types

In the survey, we often asked academics 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.” In our reporting here, we have aggregated 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 with historical decisions in the US questionnaire 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 academics 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.

Another 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 academics to rate from 1 to 10 how well the statement describes their point of view, where a 10 equals “extremely well” and a 1 equals “not at all well.” Strongly worded statements can offer an engaging mechanism for assessing reactions, especially issues that may generate an emotional response; they reflect perceptions that, in conjunction with other data, can be used to establish underlying value. Again, 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 were grouped together for analysis and characterized as “strongly disagreeing” with the statement; and responses of 4, 5, 6, and 7 grouped together and characterized as relatively neutral responses.

In this report, we share questions exactly as they were presented in the questionnaire itself. We did not provide additional information in the questionnaire that would, for example, define what was meant by specific terms in the questions. Readers should bear in mind 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.

## Acknowledgments

This project was guided by a group of advisors from Jisc, RLUK, and RLUK member libraries, who 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 group were:

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

We thank them for their tremendous contributions.

In parallel, we have conducted a Faculty Survey focused on US 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 also thank:

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- Al Bertrand, Princeton University Press;
- Peter Dougherty, Princeton University Press;
- 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 are grateful to our colleagues who contributed to our work on this project in a variety of ways, including Matthew Long, Deanna Marcum, Heidi McGregor, Jennifer Rutner, Matthew Staiger, 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 UK Survey of Academics was designed to explore the changing ways that academics publish, share, and use different types of materials in the course of their research. As a baseline for our analysis of various aspects of the life cycle of academic materials, we explored the specific types of materials that academics use in their research and teaching, including both traditional and more recently developed formats for sharing academic knowledge as well as types of materials that are not specific to the academy.

### Types of materials used in research

It is firmly established in the literature that “the peer-reviewed journal article is the primary mode of research 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.”<sup>11</sup> Our findings generally concur with this perspective, although we found that the importance of the peer-reviewed journal article is not unique to the sciences and quantitative fields, as academics across disciplinary groupings described the peer-reviewed journal article as very important to their research (see Figure 1).

Two other types of materials were rated as very important by a majority of academics. About 3 out of 5 respondents indicated that pre-print versions of articles that will be released in a peer reviewed journal are very important to their research, and a similar share indicated that research monographs or edited volumes published by an academic publisher are very important to their research. There were, however, stark differences in how these two material types were rated between different disciplinary groupings (see Figure 2).

Pre-prints were rated as very important by almost three-quarters of medical/veterinary academics, more than two-thirds of scientists, and by about 60% of social scientists. In contrast, only about a third of humanists rated pre-prints as very important to their research. However, when respondents were asked—in a separate question—how often they read or cite pre-prints or other versions of a work made available by the author directly or through an institutional or disciplinary repository, slightly different disciplinary patterns emerged. More than half of respondents in the social sciences and almost two-thirds of respondents in the sciences reported that they often or occasionally read pre-prints instead of the final version, and about 2 in 5 respondents in the arts and humanities and medical/veterinary fields reported that they do so. In particular in the medical/veterinary fields, a much larger share of respondents describe pre-prints as very important than suggest they often or occasionally read them. However, while *reading* pre-prints is relatively common for many academics,

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11 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).

FIGURE 1

“Academics draw on a variety of different types of 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 to their research.

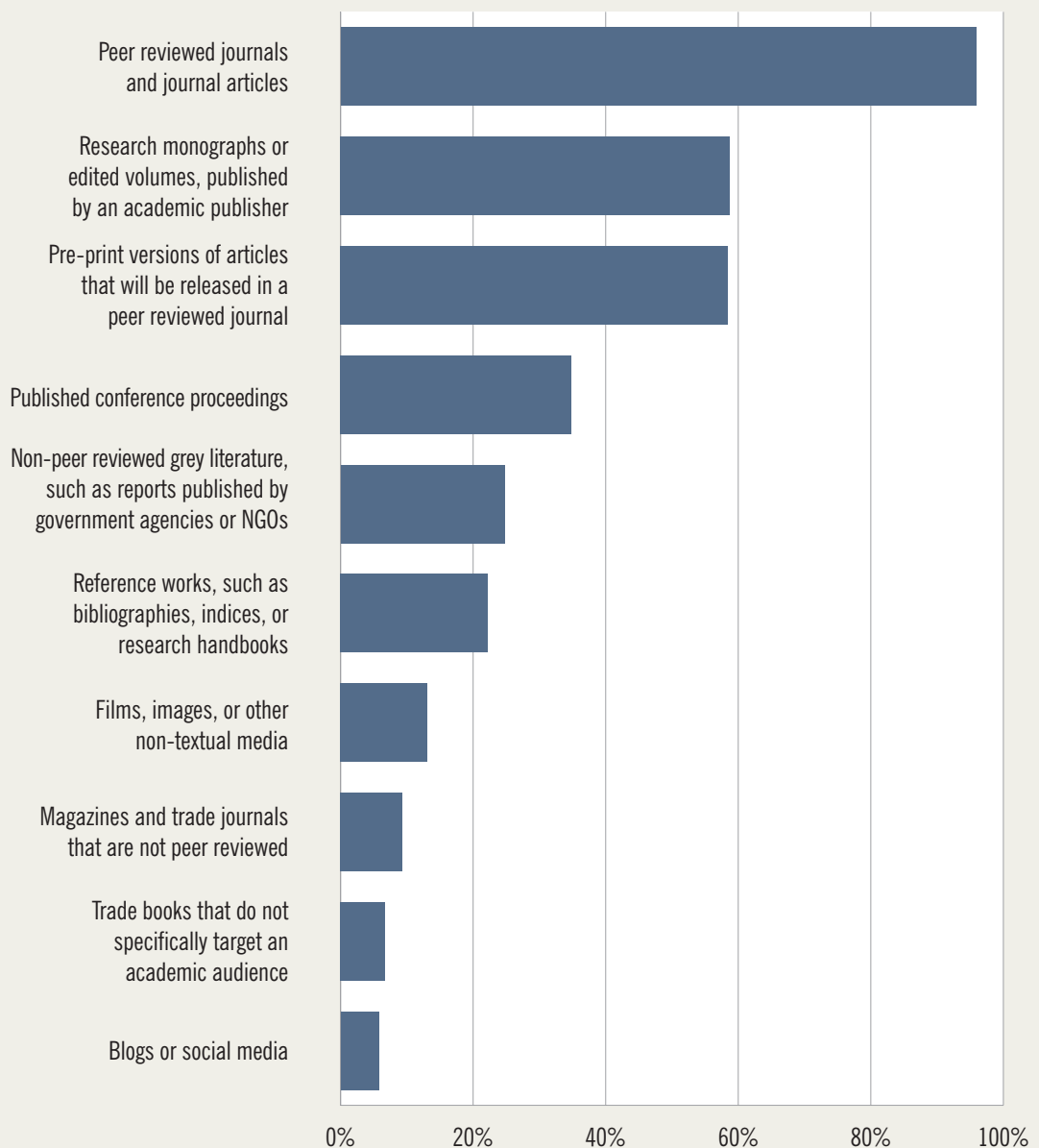
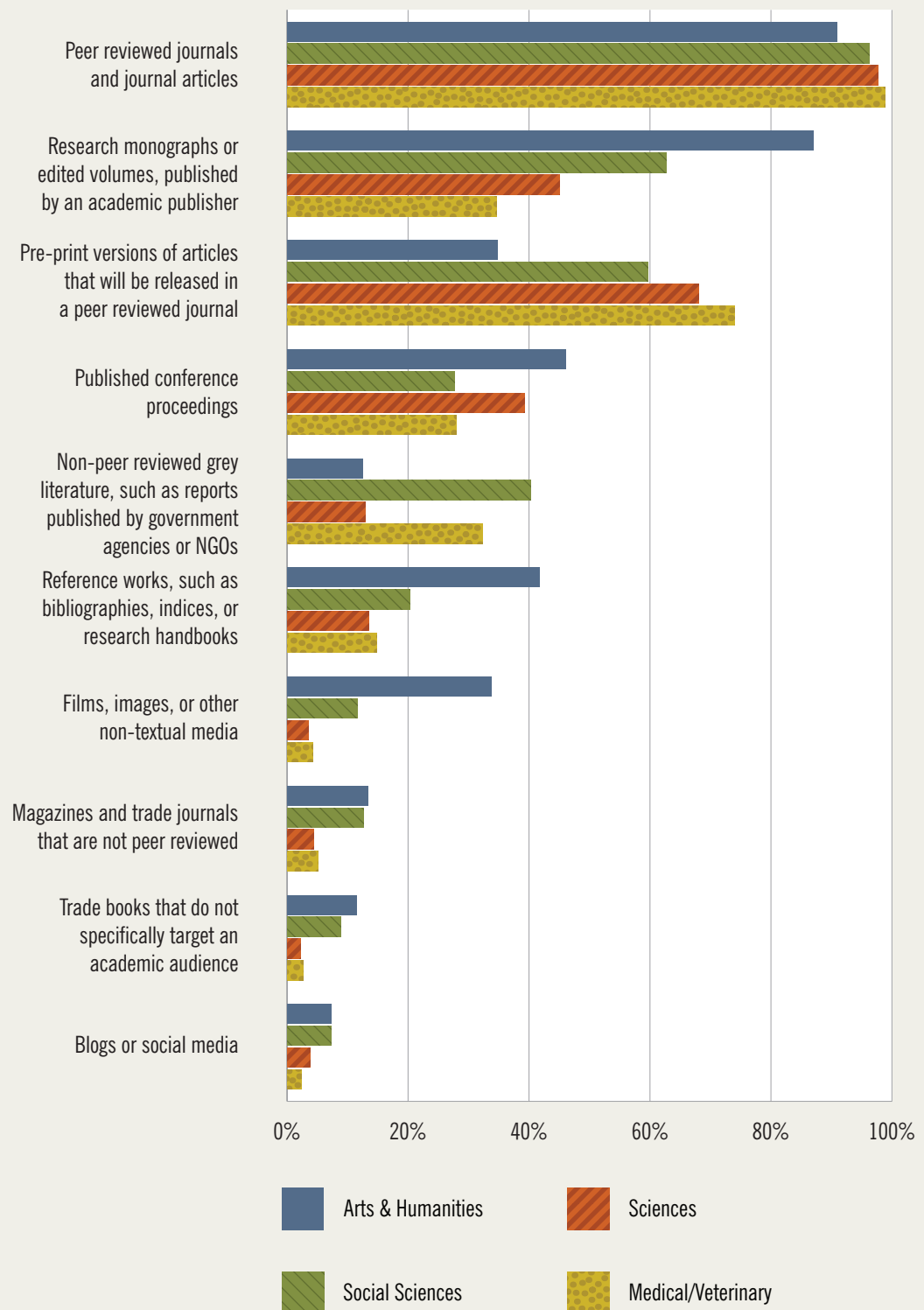


FIGURE 2

“Academics draw on a variety of different types of 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 to their research, by disciplinary grouping.



across disciplinary groupings, less than a quarter of respondents reported *citing* pre-prints instead of the published version, suggesting that they are not seen to replace the “canonical” version of the article.

Regarding research monographs or edited volumes, almost 90% of humanists rated these as very important to their research, almost as many as rated peer-reviewed journals as very important. Slightly less than half of scientists, and only about a third of medical/veterinary academics, rated monographs or edited volumes as very important to their research. About 60% of social scientists rated these materials as very important to their research.

Other material types were rated as very important by substantially smaller shares of respondents. Around a third of respondents reported that published conference proceedings are very important, and about a quarter reported that reference works and non-peer reviewed “grey literature” (such as reports published by government agencies or NGOs) play a very important role in their research. Only 1 out of 10 respondents rated films, images or other non-textual media as very important, and even smaller shares rated magazines and trade journals, trade books for a non-academic audience, and blogs or social media as very important. Even with these less popular materials, disciplinary differences are evident; larger shares of social scientists and medical/veterinary academics rated grey literature as very important in their research than did humanists or scientists, while a substantially larger share of humanists reported that reference works and films, images, and other non-textual sources are very important to their research, compared to academics in other fields.

## Types of materials used in teaching

Although journals and monographs are paramount in importance for research, the type of material that the largest share of respondents reported using in the classroom was a tool specifically designed for student use: the textbook (see Figure 3, Figure 4, Figure 5). Almost three quarters of respondents reported “often” assigning their students to use textbooks in first and second year courses, and more than 9 out of 10 reported doing so “often” or “occasionally.” Textbooks are only slightly less commonly used in third and fourth year courses; about 3 in 5 reported that they assign them often, and slightly less than 90% reported doing so often or occasionally. In both first and second year courses, as well as in third and fourth year courses, there is relatively little variation in the use of textbooks between disciplinary groupings.

Though not quite as common as textbooks, journals and monographs are also commonly assigned to undergraduates. More than 8 out of 10 respondents indicated that they often or occasionally assign academic articles to their first and second year students, and a greater share—more than 9 in 10—reported doing so for third and fourth year students. The practice of assigning academic articles as readings is substantially less common in the sciences than in other fields, especially in first and second year courses. In the arts and humanities, a large share of respondents indicated that they regularly assign academic monographs or monograph chapters, especially to third and fourth year students,



FIGURE 3

“How often do you assign your students in a [first or second/third or fourth] year undergraduate course to read or otherwise engage with each of the following types of materials in preparation for a class?” Percent of respondents indicating they assign each of the following materials either “often” or “occasionally”.

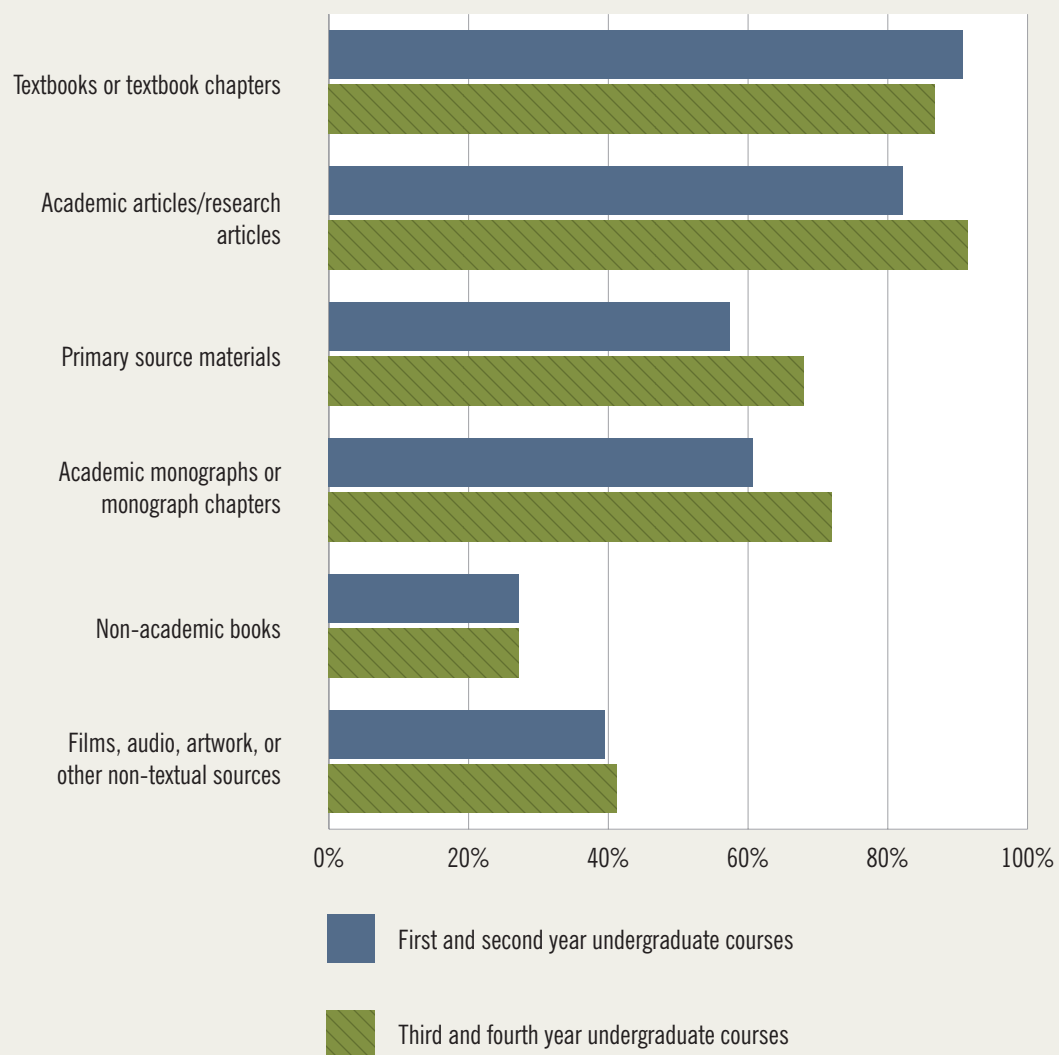


FIGURE 4

“How often do you assign your students in a first or second year 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.

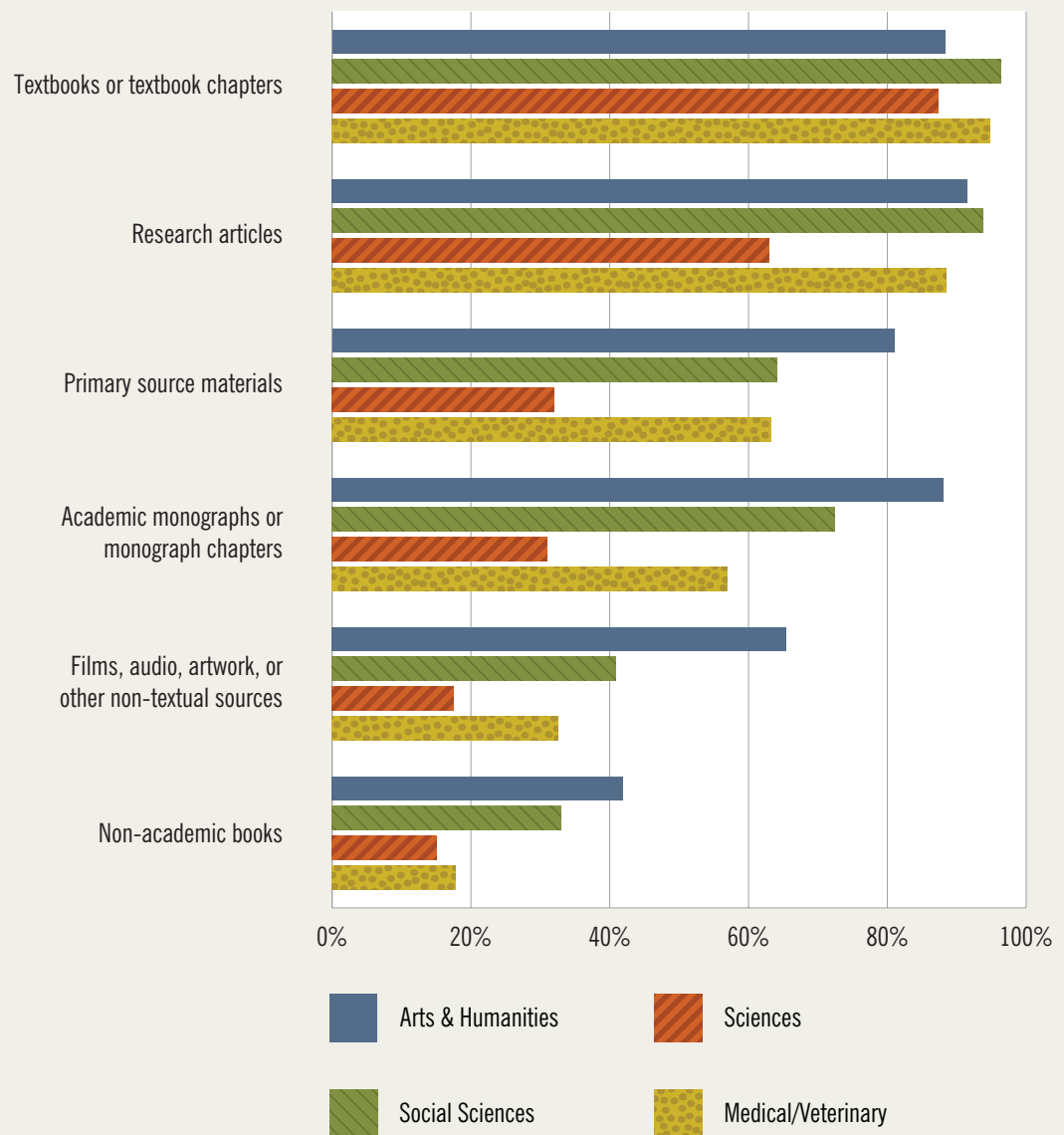
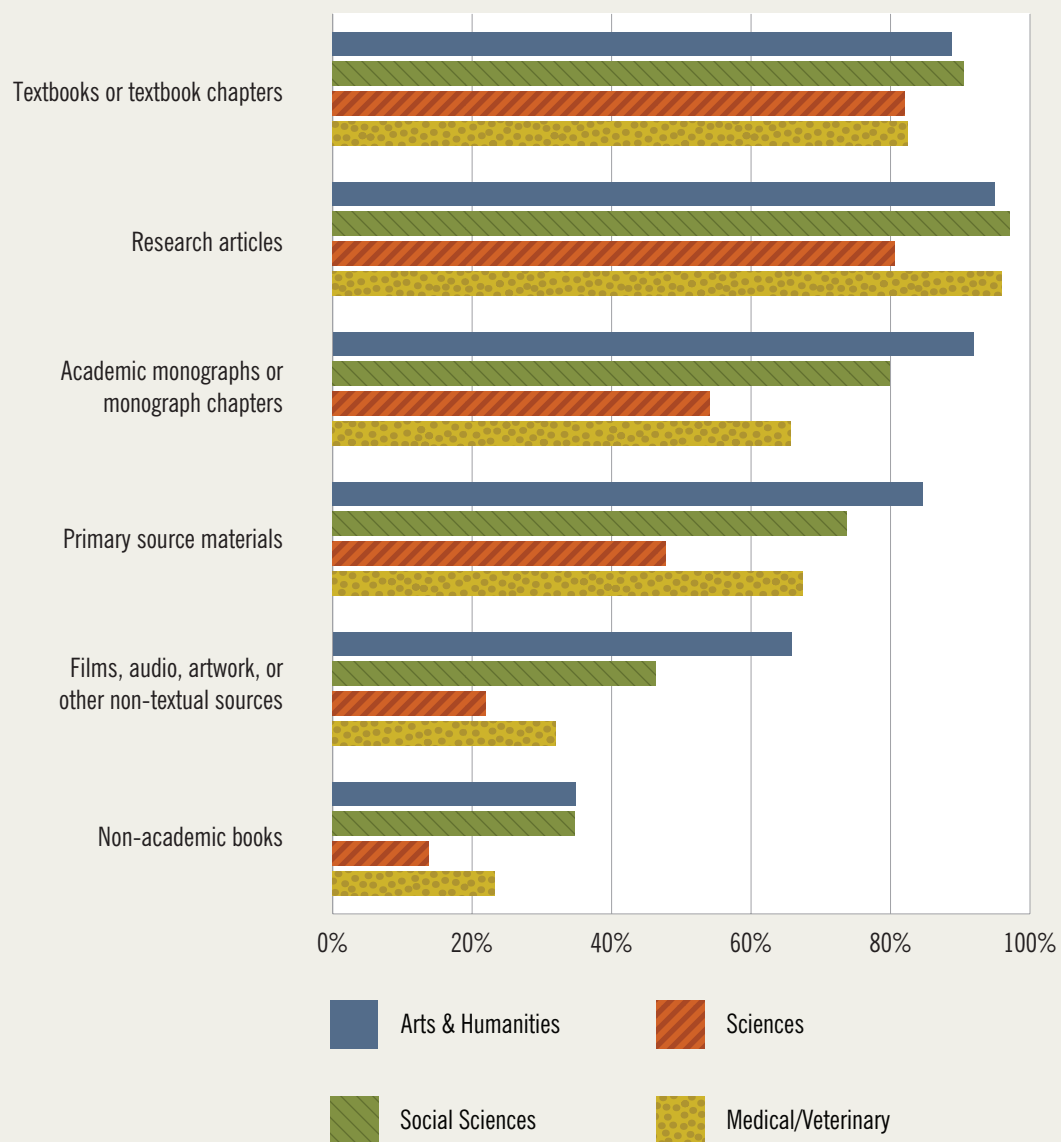


FIGURE 5

“How often do you assign your students in a third or fourth year 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.



while this practice was substantially less common in the sciences and medical/veterinary fields. There is a similar disciplinary pattern for the assignment of primary source materials. A smaller share of all respondents—around 4 out of 10—reported “often” or “occasionally” assigning films, audio, artwork, or other non-textual sources (although this was much more common in the arts and humanities), and an even smaller share—around a quarter of respondents—reported assigning non-academic books.

## Discovery

While a wide array of primary and secondary academic resources remain important to academics in their research and teaching, the way that they find these materials has evolved substantially as an increasing share are made available digitally. Research by others suggests that academics utilise a diverse range of tools and approaches—including an array of resources provided by libraries, scholarly information providers, and mainstream search providers—to identify and locate materials relevant to their research and teaching. Academics make choices between these possible avenues for discovery based on a variety of variables related to their immediate needs and circumstances.<sup>12</sup> Other research has revealed that resource discovery is often far from a methodical and deliberate process; digital information seekers “power browse” rapidly through sources and tools to explore the literature broadly and find valuable pieces of information.<sup>13</sup> To assess where academics in different fields turn when they are beginning their research, we asked academics to select which one of five potential starting points they use to begin locating information for their research (see Figure 6 and 7):

- Visit the physical library
- A general purpose search engine on the internet or world wide web
- Your online library catalogue
- A specific electronic research resource/computer database
- A national or international catalogue or database

Overall, the largest share of respondents—about 40%—indicated that they begin their research processes at a general purpose search engine on the internet or world wide web. A slightly smaller share—about one-third of respondents—indicated that they begin their research at a specific electronic research resource/computer database. A relatively smaller share—slightly less than 15% each—of respondents reported starting with an online library catalogue or a national or international catalogue or database, and only a very few (2%) reported starting their research with a visit to the library building.<sup>14</sup>

While this general pattern is relatively consistent among academics in the arts and humanities, sciences, and social sciences, medical/veterinary respondents reported a slightly different set of starting points. While a general purpose search engine was the most widely cited starting point in other disciplinary groupings, the largest share of medical/veterinary respondents indicated that they begin their research with a specific electronic research resource, and a slightly smaller

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12 Tracy Gardner and Simon Inger, “How Readers Discover Content in Scholarly Journals.” *Renew Training*, 2012, <http://www.renewtraining.com/How-Readers-Discover-Content-in-Scholarly-Journals-summary-edition.pdf>.

13 See “Information Behavior of the Researcher of the Future,” a CIBER briefing paper commissioned by the British Library and Jisc (11 January 2008), [http://www.jisc.ac.uk/media/documents/programmes/reppres/gg\\_final\\_keynote\\_11012008.pdf](http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf).

14 We recognize that resources are indexed and linked to in a variety of ways, and academics who begin at a general purpose search engine may be directed to resources on other platforms. However, this particular question asks specifically about the perceived “starting point” for research.

FIGURE 6

“Below are five possible starting points for research. Typically, when you are conducting academic research, which of these five 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.

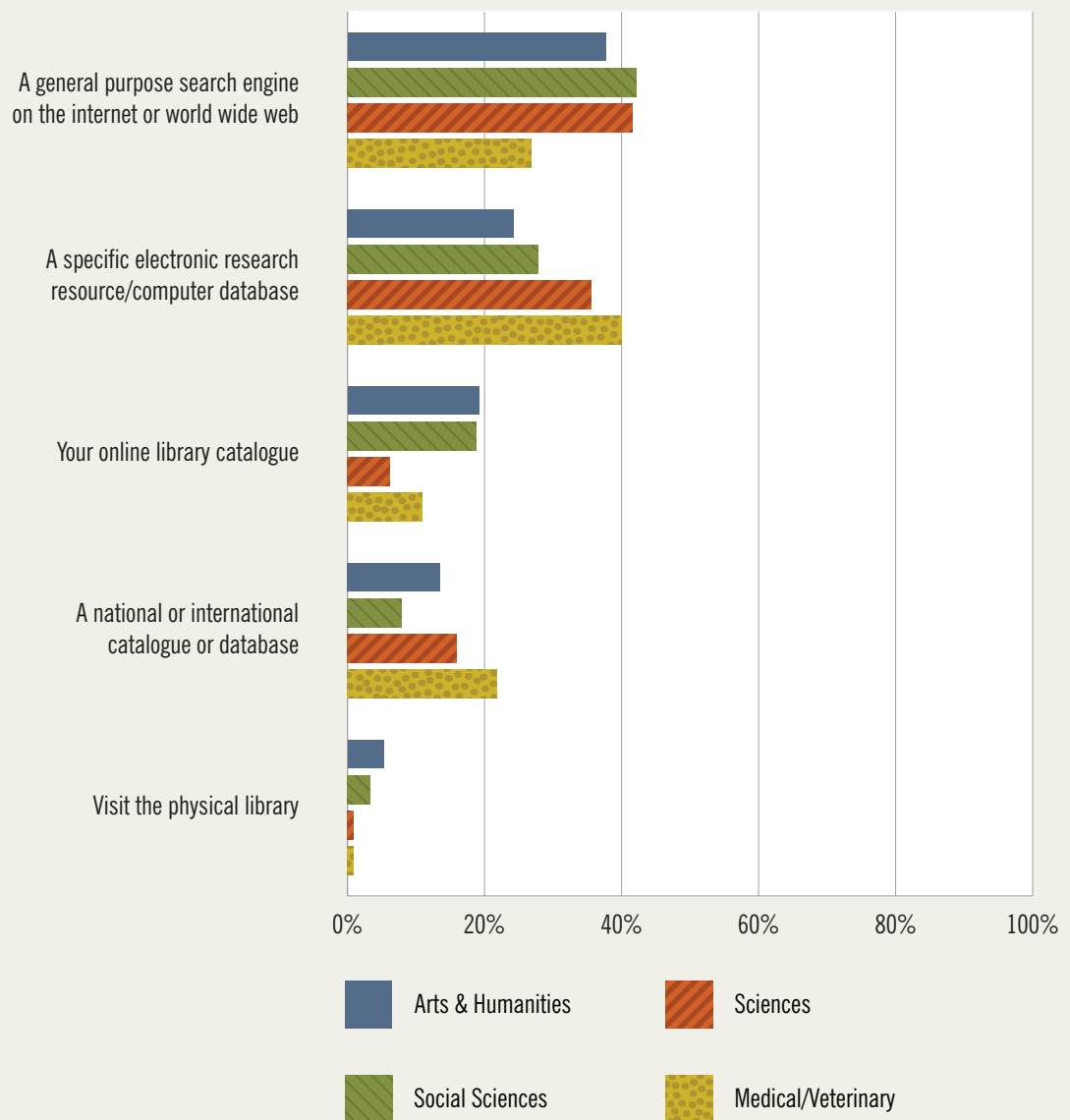
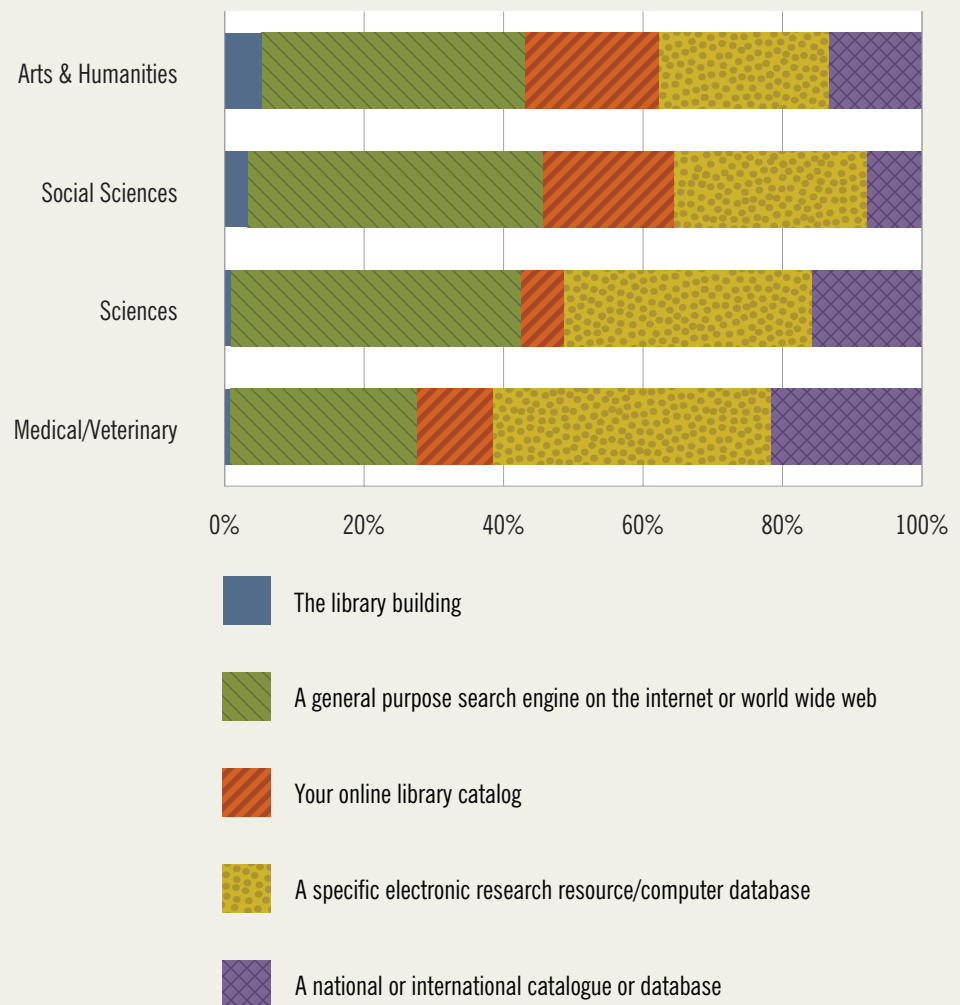


FIGURE 7

“Below are five possible starting points for research. Typically, when you are conducting academic research, which of these five 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.



share (20-25%) of these academics indicated they begin at a general purpose search engine or national or international catalogue. Relatively smaller shares of academics in the arts and humanities and social sciences reported that they begin at specific electronic research resources, while a relatively larger share reported beginning at an online library catalogue.

To understand better how academics use sources in different types of research activities, we asked respondents to consider where they begin their research processes in two specific scenarios: first, when they try to locate a specific piece of secondary research literature that they already know about but do not have in hand (“known item searches”); and second, when they explore the research literature to find new journal articles and monographs relevant to their research interests (see Figure 8).

When seeking a known item, roughly similar shares of respondents—slightly more than one third in each case—reported that they either begin their research at their college or university library’s website or online catalogue, or that they search on a specific academic database or search engine. A slightly smaller share—about a quarter—indicated that they begin their research at a general purpose search engine. Virtually none of our respondents reported that they ask a colleague or a librarian when locating known pieces of secondary research. Again, this pattern masks underlying differences between the disciplines. More than half of humanists reported that they begin their search for known items at their college or university library’s website or online catalogue; this may reflect the relatively greater importance of monographs in these fields. On the other hand, about half of scientists and medical/veterinary academics reported that they begin their known item searches at specific academic databases or search engines.

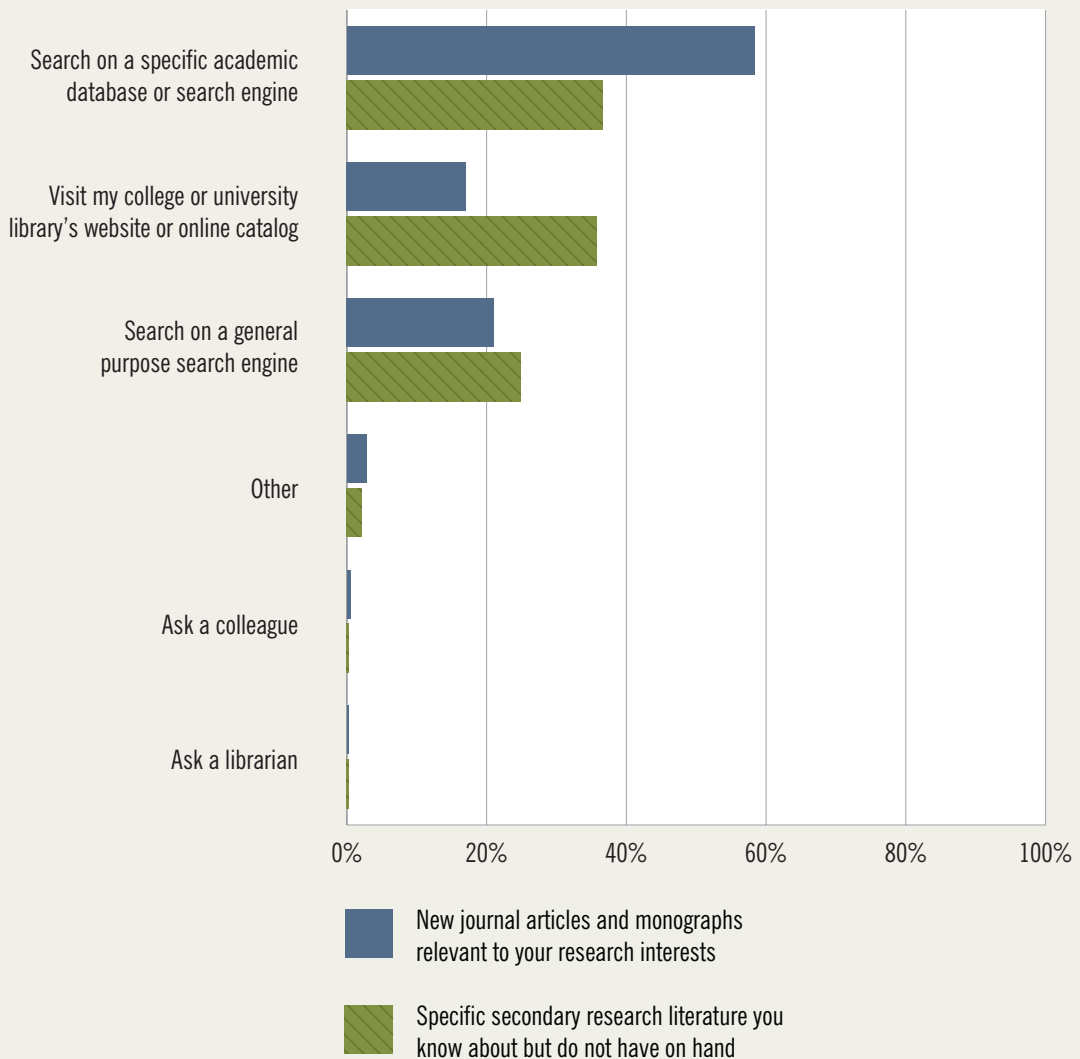
In contrast to known item searches, academics behave differently when searching for *new* journal articles and monographs relevant to their research interests. In all disciplinary groupings, most respondents reported that they start their search at a specific academic database or search engine. Although this was the most widely selected across disciplinary groupings, relatively larger shares of medical/veterinary respondents (almost three-quarters of these respondents) selected this starting point than did scientists (slightly less than two thirds) or social scientists and humanists (about half). In most of these other disciplinary groupings, general purpose search engines and library websites were each selected by roughly one in five respondents. A slightly smaller share of scientists reported that they start at the library website.

But while these questions illuminate where academics *begin* their research, they may utilise a variety of different types of resources over the course of their research. Over three-quarters of our survey respondents strongly agreed that they “often use a variety of different sources... [when] looking for journal articles and monographs in the course of my research”, with relatively larger shares of humanists and social scientists reporting that they often do so. Most have adapted to this multimodal model; less than a third of respondents reported that they find it “very frustrating” to use a variety of different tools and databases to find and access journal articles, monographs, finding aids, datasets, primary



FIGURE 8

“When you explore the research literature to find new journal articles and monographs relevant to your research interests, how do you most often begin the process?”; “When you try to locate a specific piece of secondary research literature that you already know about, how do you most often begin your process?” Percent of respondents who indicated that they begin their research process with each of the follow resources.

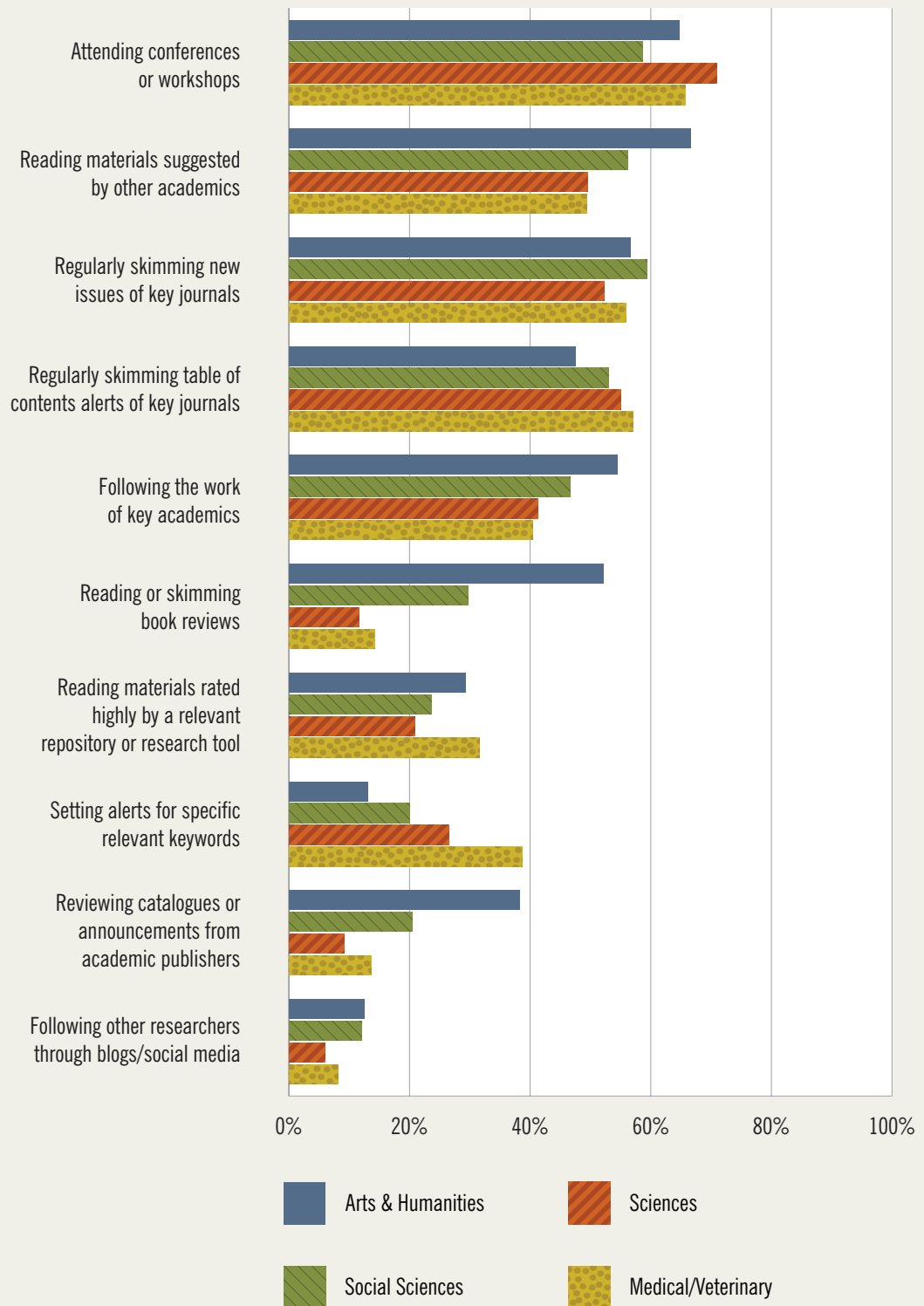


sources, and other types of academic sources. A larger share of medical/veterinary academics—about 40%—reported that they find it very frustrating than did academics in other fields.

We recognize that academics keep up with their fields in a variety of ways that go well beyond the process of searching for academic literature. In response to a question about tactics for “keeping up” with current research in one’s field, respondents favoured tried and true methods, indicating that they keep up through interacting with or following the activities of a variety of people (both their immediate peers and important figures in their field) and through reading key published materials (see Figure 9). All of the responses that were

FIGURE 9

“You may employ a variety of different tactics to ‘keep up’ with current research 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 research in your field.” Percent of respondents who indicated that each of these “tactics” is very important for keeping up with research in their field, by disciplinary grouping.



rated as very important by a majority of respondents involved either engaging with peers, such as attending conferences, reading materials suggested by their peers, following the work of key academics (which was rated as very important by slightly less than half of respondents), or tracking key journals by either skimming new issues or receiving alerts about their tables of contents.

Some approaches differ substantially by discipline; for example, the share of humanists that identified reading book reviews or reviewing catalogues or announcements as very important was substantially greater than the share of academics in other fields who did so. And slightly larger shares of humanists indicated that reading materials suggested by fellow academics or following the work of key academics are very important to them, while a relatively larger share of medical/veterinary academics indicated that setting alerts for specific relevant keywords is a very important method than did academics in other disciplinary groupings.

## Providing materials to academics: formats and sources

Research materials today are often made available in a variety of formats, from traditional print books and journal articles to digitised versions of these materials and born-digital formats that take full advantage of the opportunities presented by the digital environment. In some contexts, digital formats are supplanting traditional print formats entirely, while in others they may play more complementary roles. For institutions that support academics—including publishers, libraries, learned societies, and others—understanding how academics perceive the roles of print and digital formats may provide critical intelligence for decision-making.

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

Many libraries and publishers alike have embraced the opportunity to move current issues of academic journals online. For many academics, the digital version of a new issue of the journal is the primary mode of access, although attitudes vary somewhat as to how exclusively libraries and publishers should rely on electronic-only access to current issues of academic journals. Overall, nearly three-quarters of respondents strongly agreed with the statement “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,” but academics in different disciplinary groupings responded to this statement differently (see Figure 10). This notion is relatively uncontroversial among scientists and medical/veterinary academics, of whom 4 out of 5 strongly agreed with this statement. Among social scientists and, in particular, humanists, however, there was less agreement, with roughly 70% of social scientists and less than 3 in 5 humanists strongly agreeing with this statement.

While a majority of academics in all fields, and almost all academics in some, agreed that it would be fine with them for their library to cancel print subscriptions to current issues, smaller shares of respondents in each disciplinary grouping agreed strongly with the statement “I am completely comfortable with journals I use regularly ceasing their print versions and publishing in electronic-only form” (see Figure 11). Slightly more than half of respondents overall agreed with this statement. About two thirds of scientists and medical/veterinary academics agreed that they would be comfortable with the journals they use ceasing print publication, but substantially fewer humanists—about 40%—were comfortable with this idea.

FIGURE 10

Percent of respondents agreeing strongly with the statement: "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," by disciplinary grouping.

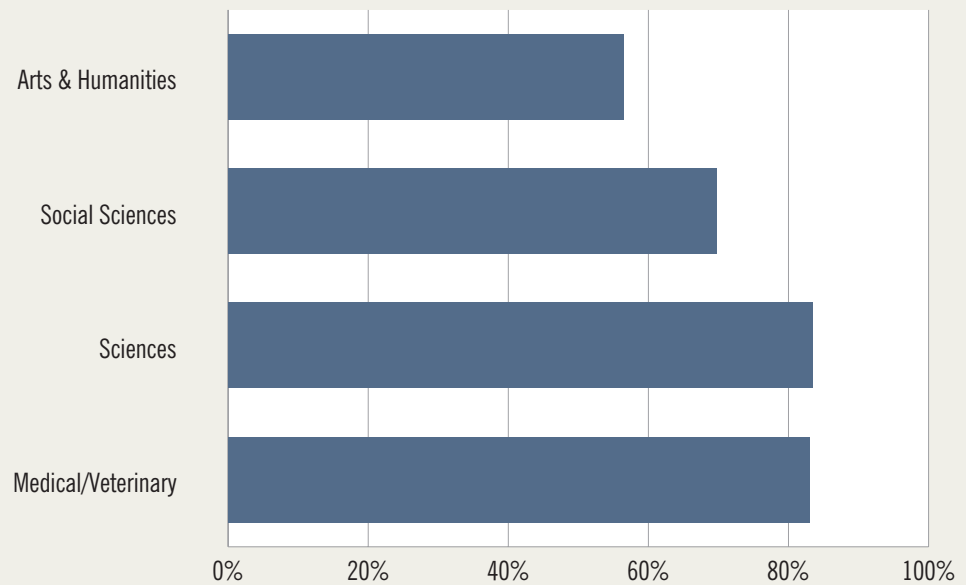
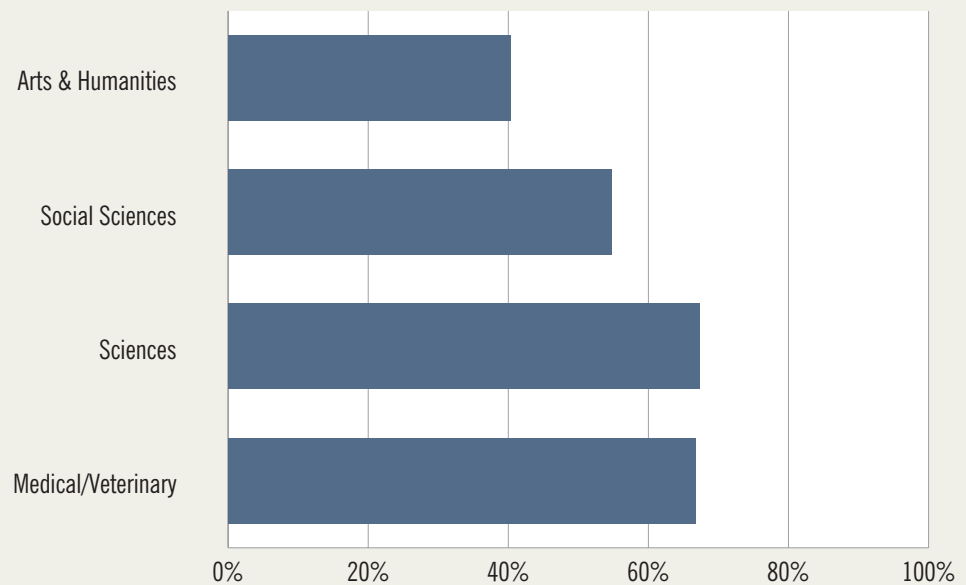


FIGURE 11

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

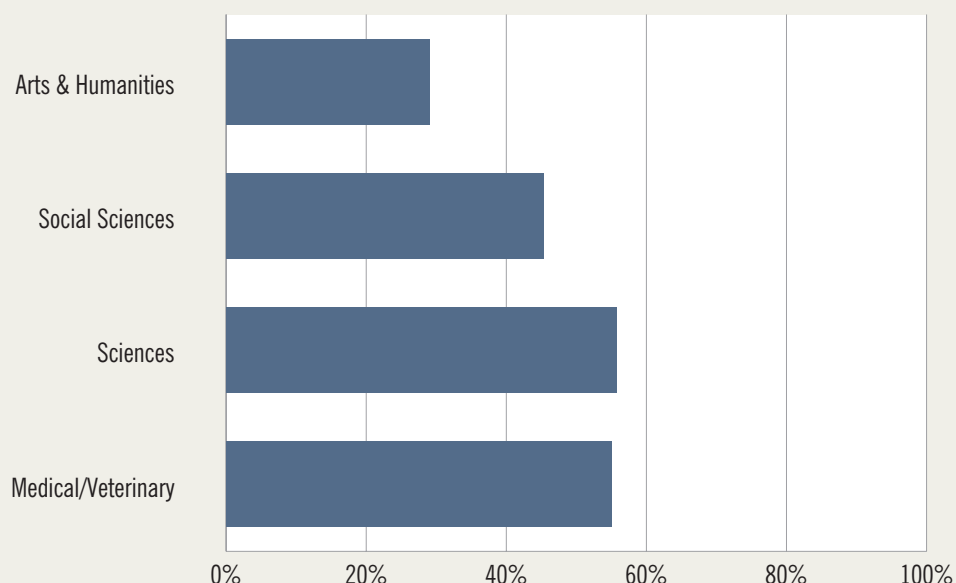


## The print-to-electronic format transition: existing collections of academic journals

Although large shares of respondents agreed strongly that it would be fine with them for their library to move away from collecting current issues of journals in print form, relatively fewer strongly agreed 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.” Slightly less than half of respondents strongly agreed with this statement overall, with sizable differences between disciplinary groupings (see Figure 12). Over half of scientists and medical/veterinary academics strongly agreed with this statement, compared to 30% of humanists.

FIGURE 12

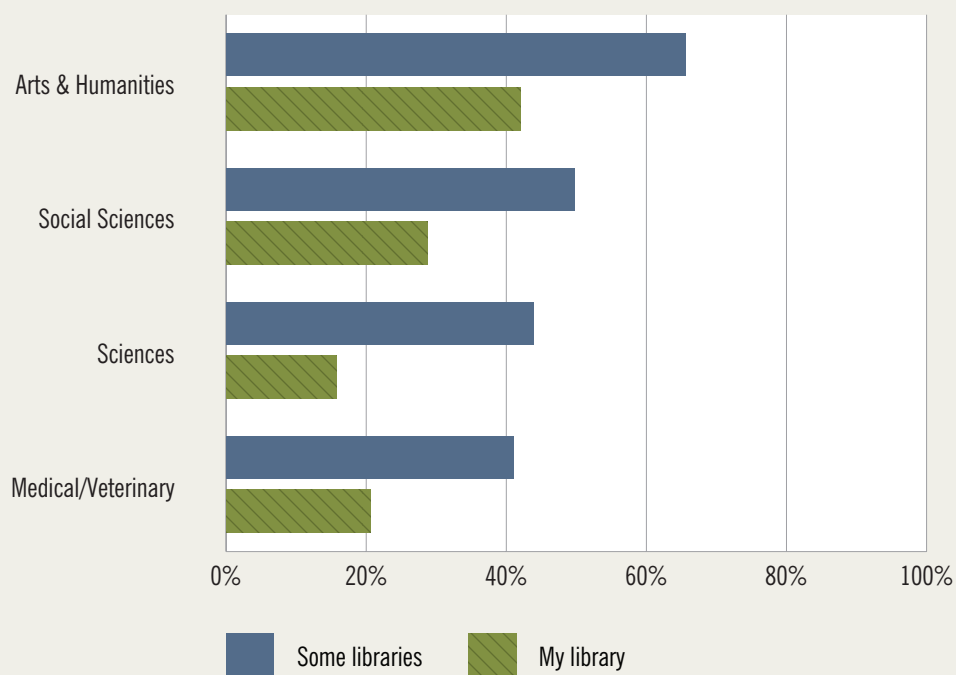
Percent of respondents agreeing strongly with the statement: “Assuming that electronic collections of journals are proven to work well, I would be happy to see hard copy collections discarded and replaced entirely by electronic collections,” by disciplinary grouping.



In order to gain a long-term perspective on this issue, we asked academics to rate their agreement with parallel statements that it will be crucial for “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.” About half of our respondents agreed that it will be crucial that *some* libraries continue to maintain these collections, but substantially fewer—only about a quarter of respondents—strongly agreed that it will be crucial that their library do so (see Figure 13). In both cases, the share of humanists who strongly agreed that retaining hard copies will be important was larger than the

FIGURE 13

Percent of respondents who strongly agreed with the statement “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,” and “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,” by discipline.



shares of academics in other disciplinary groupings, with two thirds of humanists agreeing that some library should play this role (as opposed to barely 40% of scientists and medical/veterinary academics).

### A print-to-electronic format transition for academic monographs?

While the ability to gain access to academic journal literature in digital form has been the norm for some time, it is only in recent years that digital versions of academic monographs have been made widely available to academics. Academics have cited several key advantages offered by electronic access to academic monographs, including the ability to use them online at any time and from any location and the ability to search across them, although key challenges related to their use have also been identified.<sup>15</sup>

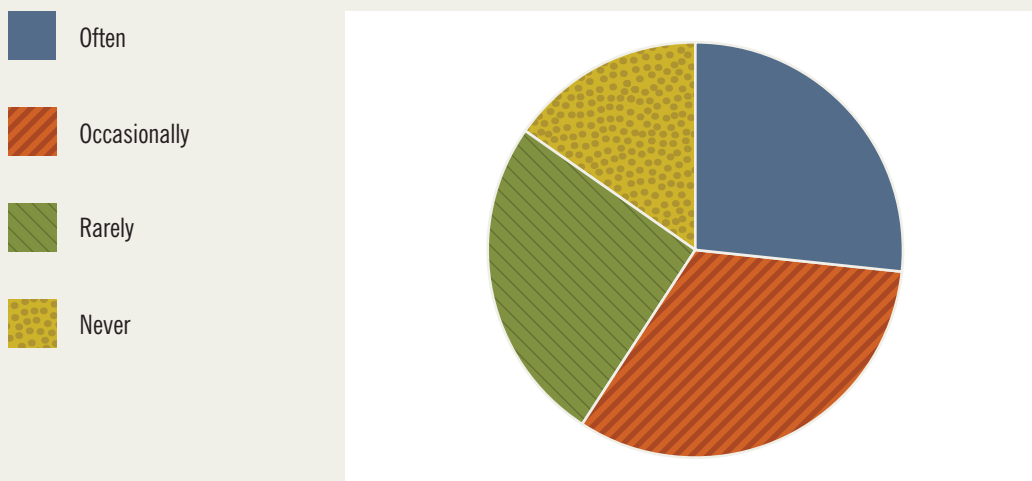
Already, digital versions of academic monographs have begun to establish themselves in practice. About 6 out of 10 respondents indicated that they have “often” or “occasionally” used academic monographs in electronic format in the past six

15 Hamid R. Jamali, David Nicholas, and Ian Rowlands, “Scholarly e-books: the views of 16,000 academics.” *Aslib Proceedings: Information Perspectives*, 61:1 (2009)

months, with only about 15% indicating that they have not done so at all (see Figure 14). This pattern holds relatively consistently across disciplines. In addition, a third of respondents strongly agreed with the statement that “electronic versions of academic monographs play a very important role in my research and teaching,” with a slightly larger share of medical/veterinary academics strongly agreeing (see Figure 15).

FIGURE 14

“You may have the opportunity to read academic monographs in electronic format, either through a library subscription database or as standalone e-books. How often have you used academic monographs in digital form in the past six months?” Percent of respondents who chose “often”, “occasionally”, “rarely”, or “never”.



Whereas for most types of academic journal articles, the digital version can be said to have supplanted the print entirely, academics indicated that electronic versions of research monographs are not well suited to all uses. We asked academics 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” (see Figure 16). 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 easier” or “somewhat easier” in digital format than in print format.

While responses did tilt the scale towards electronic versions of academic monographs for some activities, respondents also indicated a number of areas of improvement that would make digital versions of academic monographs much more valuable than they are today (see Figure 17).

The improvement rated highly by the largest share of respondents 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,



FIGURE 15

Percent of respondents who strongly agreed with the statement “Electronic versions of research monographs play a very important role in my research and teaching,” by disciplinary grouping.

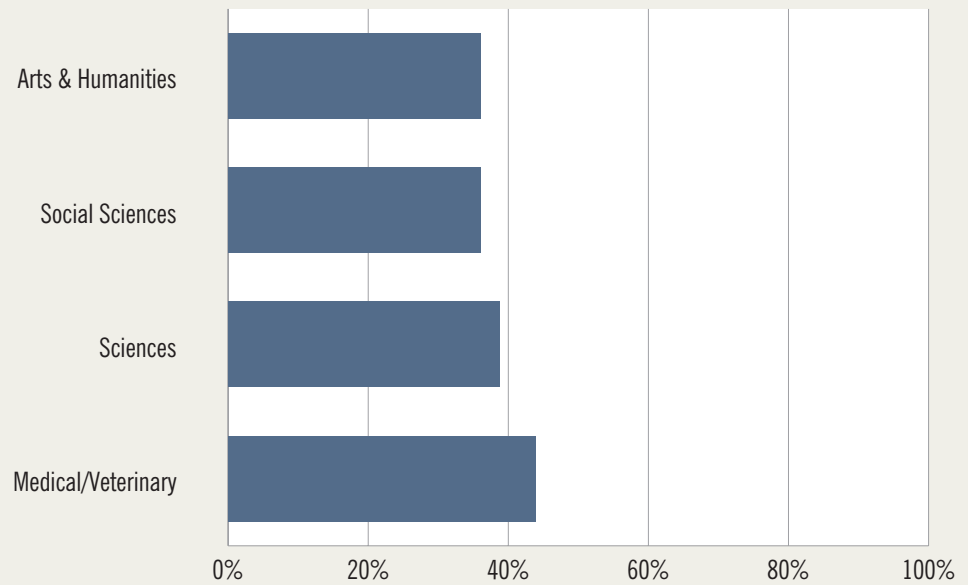


FIGURE 16

“Below is a list of ways you may use an academic monograph. Please think about doing each of these things with an academic 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 or harder in print or digital formats.

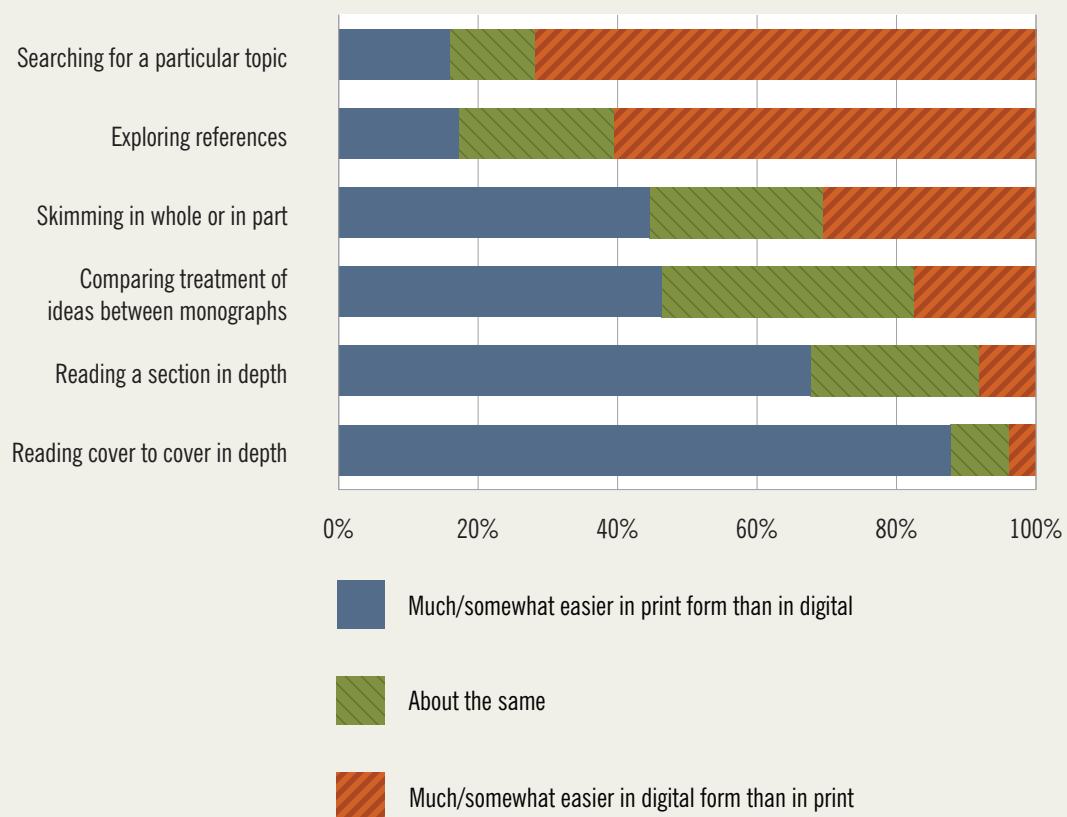
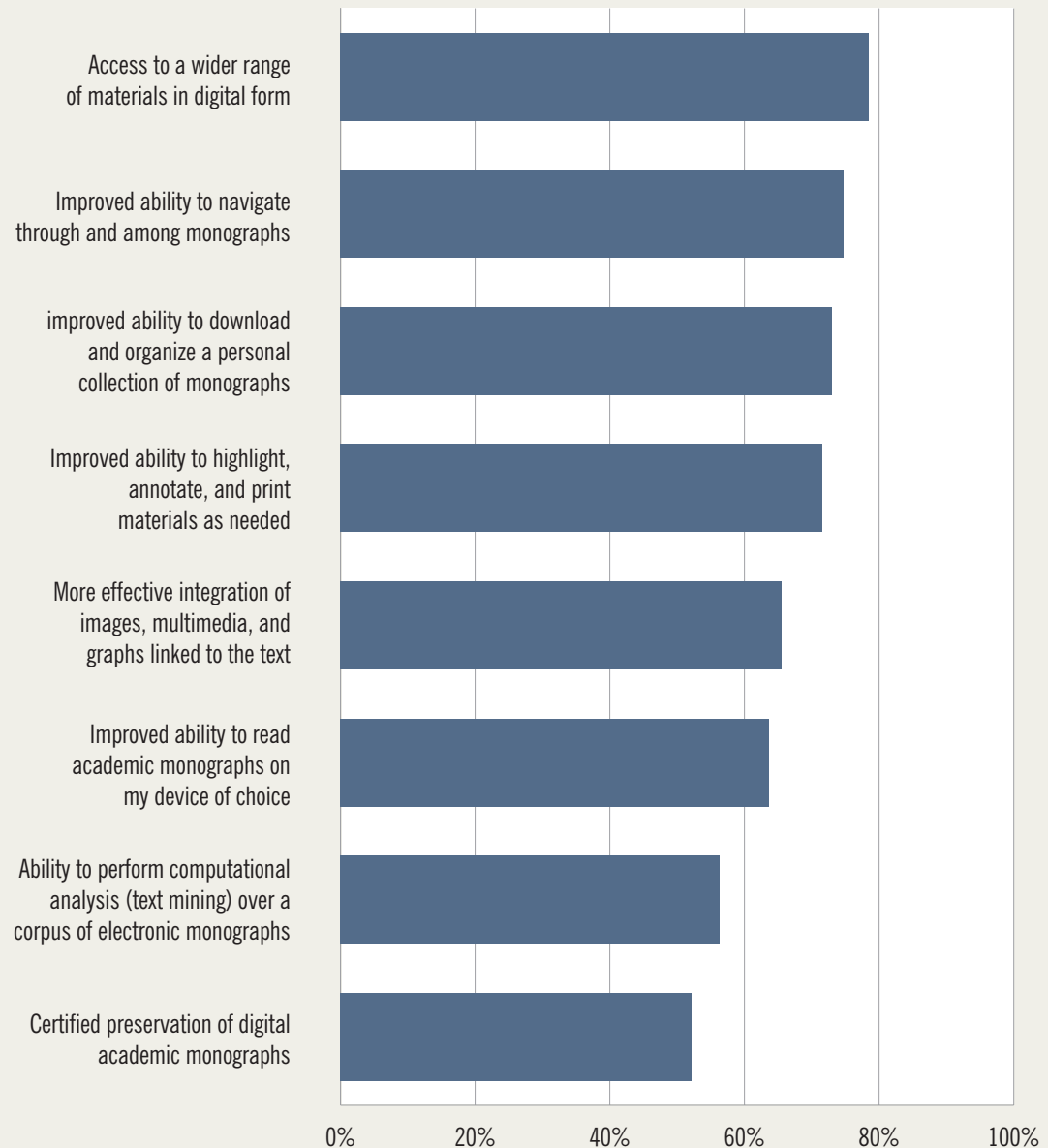


FIGURE 17

“You may have the opportunity to read academic 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 academic monographs to you than they are today.” Percent of respondents who indicated that each of these changes would make digital monographs more valuable.

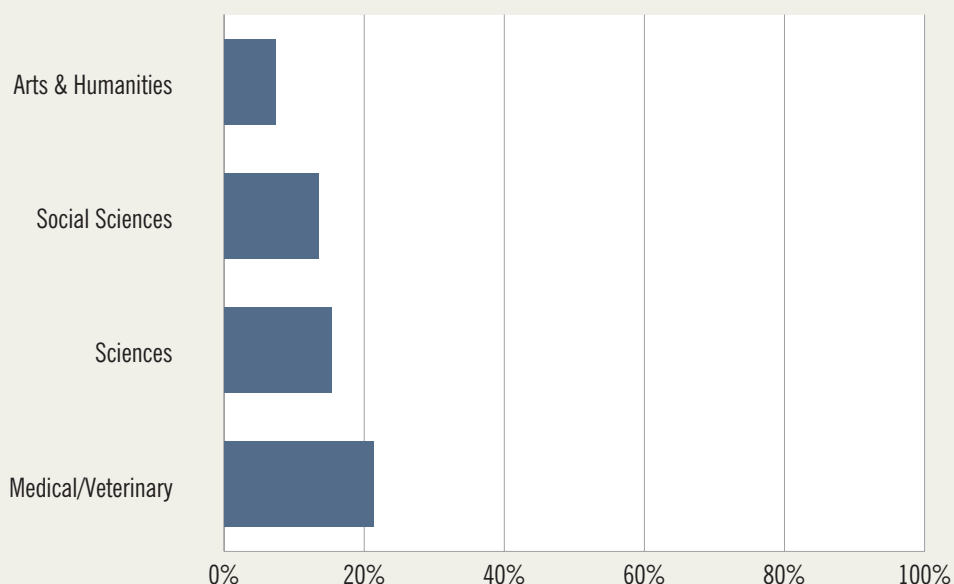


annotate, and print as needed, to read on a device of choice, and to more effectively integrate images and multimedia, were rated as very valuable by solid majorities of respondents. This indicates that there are many opportunities for digital books to be made more usable. Even the features that were rated highly by the smallest shares of respondents—better ability to perform text mining and certified digital preservation—still garnered a majority of favourable responses, although it is important to note that the question did not force respondents to consider tradeoffs or choose between various features.

While academics recognize the value of electronic versions of academic monographs and can describe opportunities for improvements, few expect that electronic versions will completely supplant print books. Only about 14% of respondents strongly agreed that “within the next five years, the use of e-books will be so prevalent among academic staff, researchers, and students that it will not be necessary to maintain library collections of hard-copy books,” with substantially smaller shares of humanists agreeing with this statement than academics in other disciplinary groupings (see Figure 18). Notably, more than a fifth of medical/veterinary academics strongly agreed with this statement.

FIGURE 18

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



## Gaining access to materials for use in research

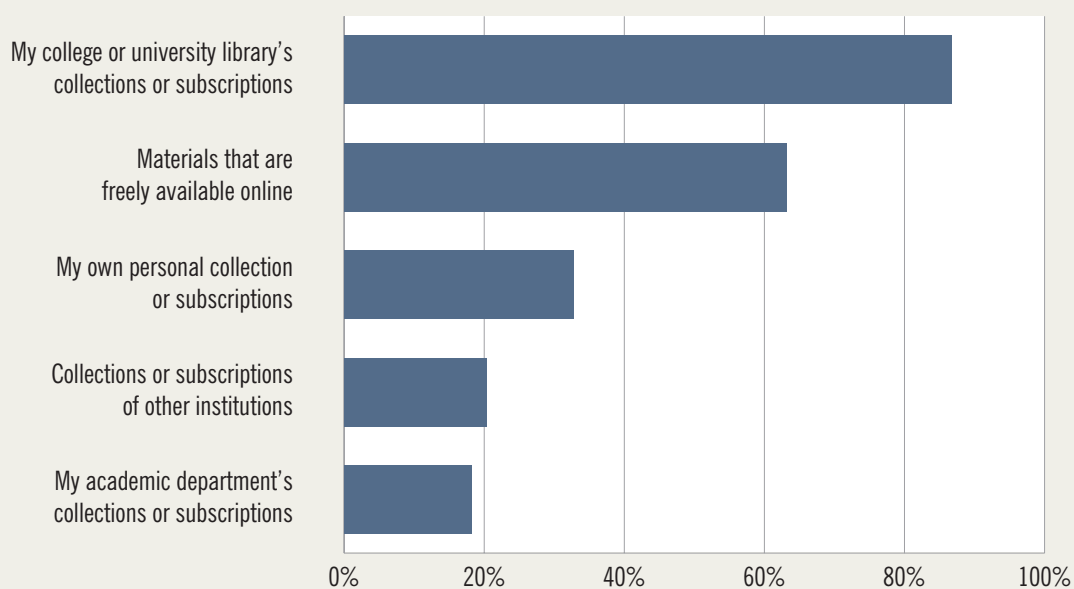
Academics rely on a variety of avenues to gain access to the materials they need for their research, including reaching needed materials directly through their college or university library’s print or digital collections. Our respondents dem-

onstrated that while their libraries' own collections are critically important to their research and teaching, they use a variety of approaches and sources to gain access to the materials they need.

Nearly 90% of respondents, with only moderate disciplinary variation, indicated that their own college or university library is a very important source of journal articles and academic monographs for research and teaching, and only a very small share of respondents indicated that these collections and subscriptions are not important sources for them (see Figure 19 and Figure 20).<sup>16</sup>

FIGURE 19

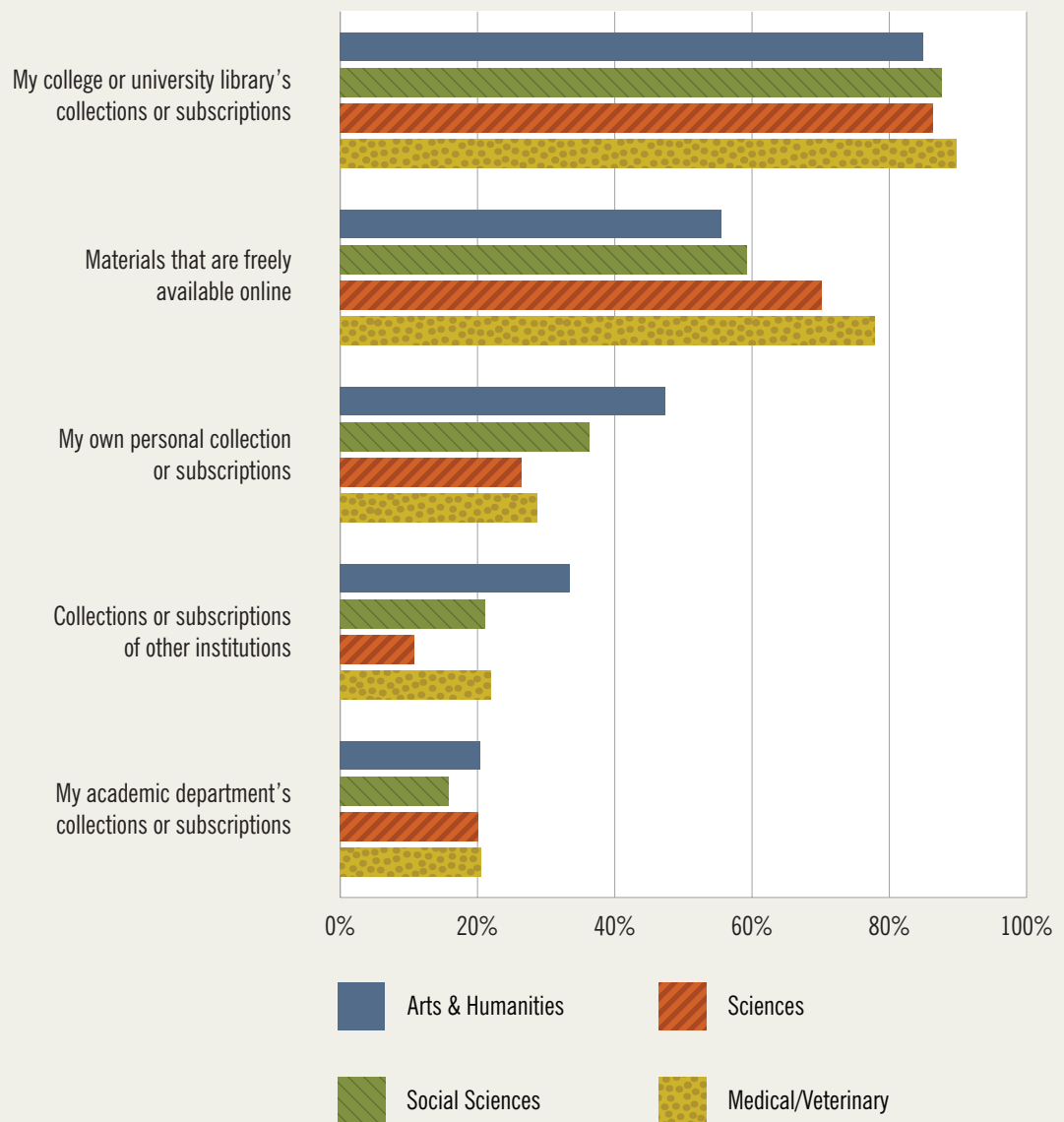
"When you think about the journal articles and monographs that you routinely use – for research as well as teaching – how important are each of the following sources?" Percent of respondents indicating that the following sources are very important.



16 We recognize that library collections are being increasingly knitted together across the UK, through services like the UK Research Reserve, Suncat, and so forth, in ways that may be increasingly seamless from the perspective of the academic. For UK Research Reserve, see Frances Boyle and Chris Brown, "The UK Research Reserve (UKRR): machinations, mayhem and magic." *Interlending & Document Supply*, Vol. 38 issue 3, 2010. For Jisc, see <https://www.jisc-collections.ac.uk/>.

FIGURE 20

“When you think about the journal articles and monographs that you routinely use – for research as well as teaching – how important are each of the following sources?” Percent of respondents indicating that the following sources are very important, by disciplinary grouping.



In the case of journal collections, about half of all respondents—slightly more in the arts and humanities than in other fields—strongly agreed that they “often would like to use journal articles that are not in [their] library’s print or digital collections.” And only slightly more than a third strongly agreed that they can “almost always get satisfactory access” to needed journal articles that are not in their library collections, a pattern that holds across disciplinary groupings.

When asked how they gain access to needed materials that their institution's library does not directly provide, more than two-thirds of our respondents indicated that they "often" or "occasionally" simply give up and look for a more easily accessed resource, a practice that was much less commonly reported in the arts and humanities than in other fields (see Figure 21 and Figure 22).

However, respondents also indicated that they pursue a variety of other approaches in satisfying their resource needs. Respondents' most commonly reported approach for seeking access to a monograph or journal article that they do not have immediate access to through their college or university libraries' physical or digital collections was to look for a freely available version online, which 90% of respondents indicated they do often or occasionally. It may be that this exercise is more often successful for scientists and, in particular, medical/veterinary academics; while almost 80% of medical/veterinary academics and 70% of scientists reported that materials that are freely available online are very important to their research, a smaller share of humanists reported that these types of materials are very important to their research, despite the fact that more than 90% of humanists often or occasionally look for these materials to satisfy needs their own library cannot meet.

About a fifth of respondents indicated that other institutions' libraries are very important to their research or teaching. This group presumably encompasses both the heaviest users of ILL or document delivery services as well as those who may make use of formally negotiated reciprocal borrowing agreements. Roughly 3 out of 5 respondents indicated that they often or occasionally use library-provided inter-library loan or document delivery services to access journal articles and monographs. In addition, informal approaches to getting content are

FIGURE 21

“When you want a 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 – often, occasionally, rarely, or never?” Percent responding that they use the following methods “often” or “occasionally.”

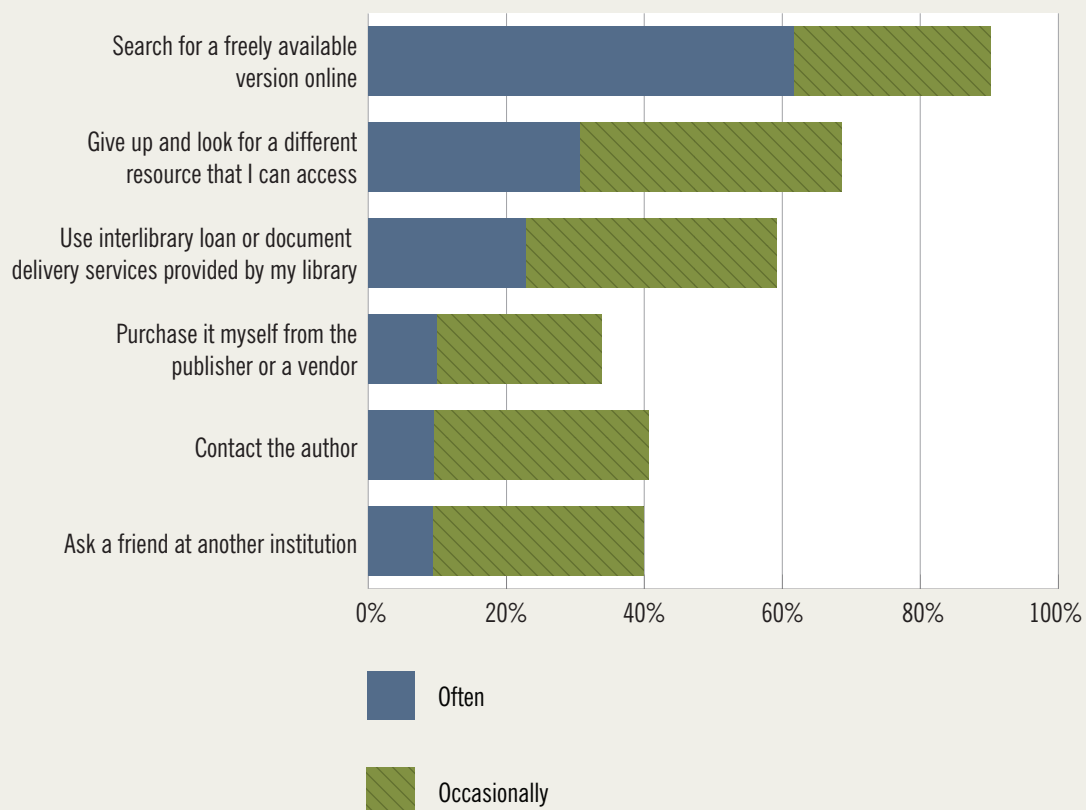
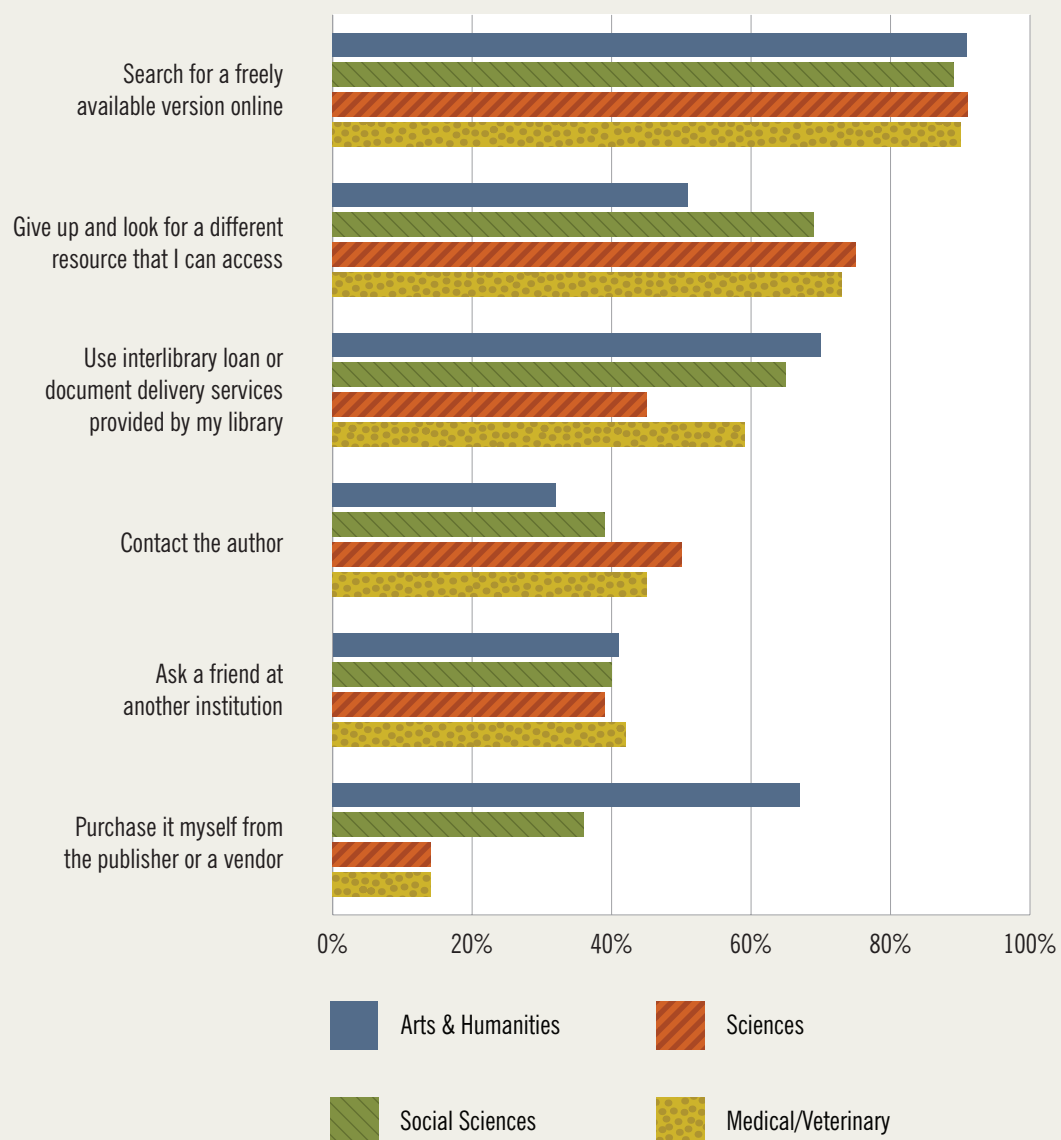




FIGURE 22

“When you want a 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 – often, occasionally, rarely, or never?” Percent responding that they use the following methods “often” or “occasionally,” by disciplinary grouping.



relatively common; about two out of five respondents indicated that they often or occasionally ask a friend at another institution to help them access materials that they themselves cannot reach.

A much smaller but still substantial share—about a third of respondents—often or occasionally purchase needed materials themselves. Academics’ 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 for about a third of respondents. This reliance on one’s own collection is substantially more common among humanists than among academics in other fields.

Comparing institution types reveals some key a slightly larger share of academics at RLUK institutions reported that their college or university library’s collections or subscriptions are very important to their research and teaching, while slightly larger shares of academics at non-RLUK institutions reported that other sources are very important to their research and teaching (see Figure 23).

Mirroring this, a larger share of academics at non-RLUK institutions indicated that they are interested in using materials outside of their library’s collections. Almost 60% of academics at non-RLUK institutions strongly agreed that they would often “like to use journal articles that are not in my library’s print or digital collections,” compared with less than 40% of academics at RLUK institutions. And when they want a monograph or journal article that they do not have immediate access to through their college or university library’s physical or digital collections, academics at non-RLUK institutions more often turn to inter-library loan than do academics at RLUK institutions (see Figure 24).

FIGURE 23

“When you think about the journal articles and monographs that you routinely use—for research as well as teaching—how important are each of the following sources?” Percent of respondents indicating that the following sources are very important, by institution type.

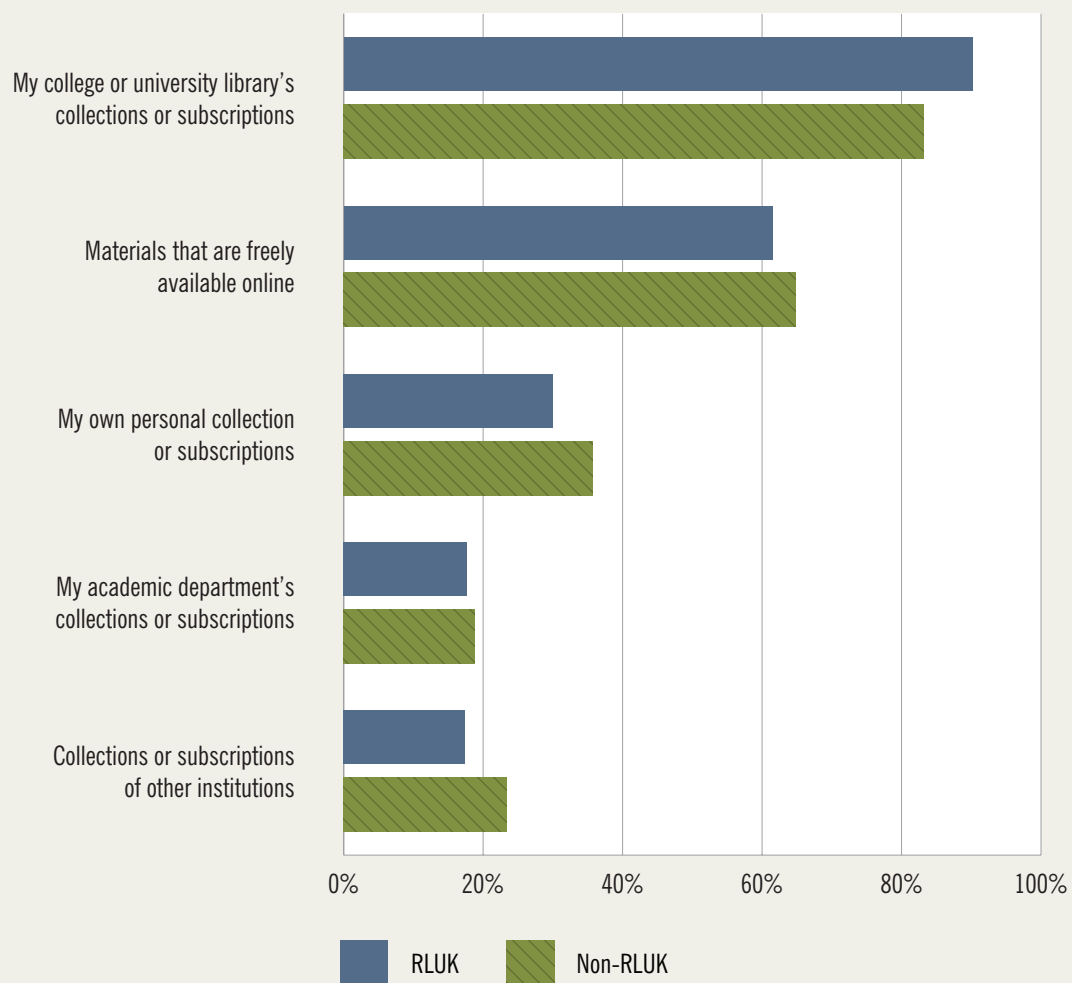
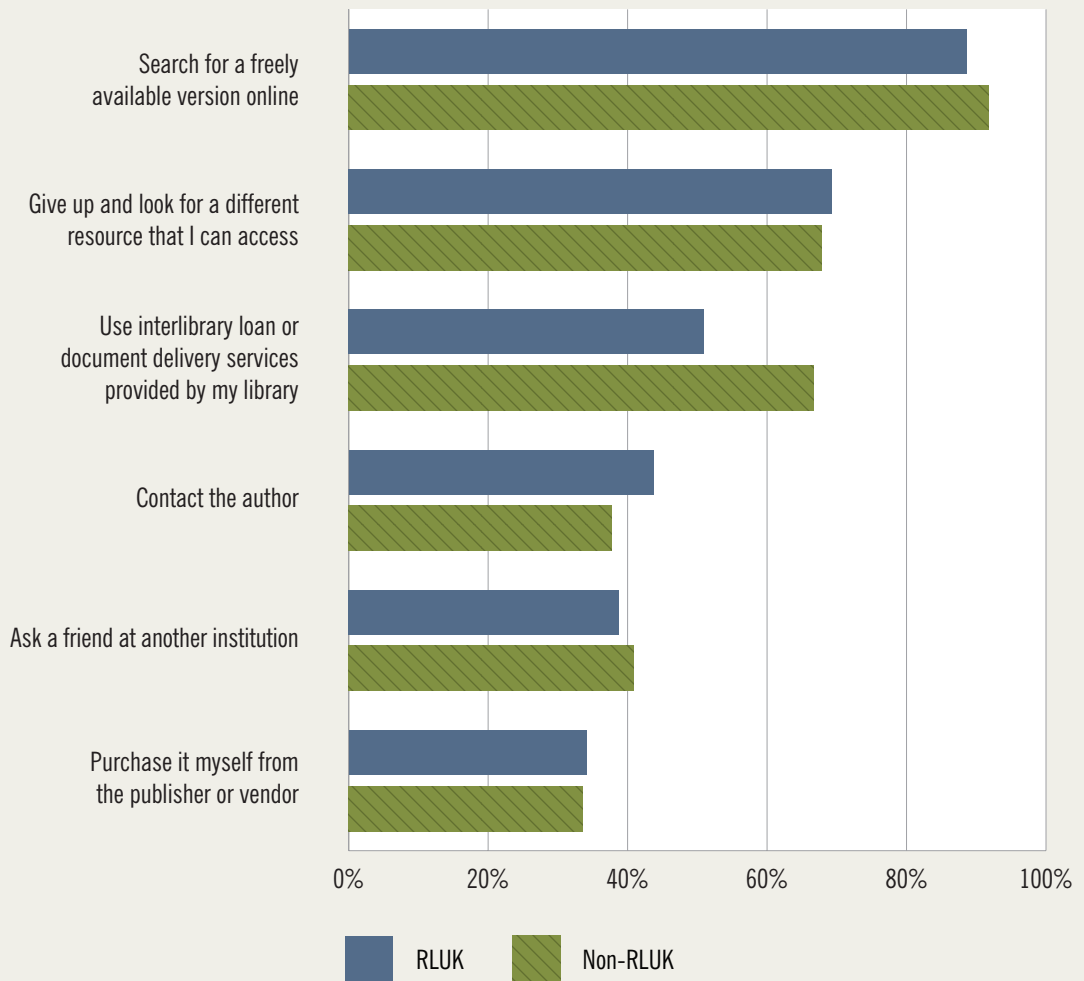


FIGURE 24

“When you want a 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—often, occasionally, rarely, or never?” Percent of respondents indicating “often” or “occasionally,” by institution type.



## Research topics and practices

In recent years, academic practices and methods have been changing with the introduction of new technologies for research. As a nation-wide tracking survey of academics across a range of disciplines, the Survey of Academics is well suited to assessing how widespread certain behaviours are across fields. But understanding research practices and their associated support needs also requires a more on-the-ground approach that deeply engages with the differences in practice between disciplines to a level to which such a national-level survey is poorly suited. Other research provides some of this qualitative depth—including the Research Information Network’s case studies of researchers in the life sciences<sup>17</sup> and humanities<sup>18</sup> as well as Ithaka S+R’s own investigation into research support service needs in the fields of history<sup>19</sup> and chemistry.<sup>20</sup> Consequently, we have focused here on the impact of digital technology on changing research practices, and academics’ needs for support in integrating digital technology more deeply into their work.

### Selection of research topics

Many academics have a relatively high degree 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. Nearly all of our respondents—9 out of 10—indicated that their own personal interests are very important in their selection of areas of research to pursue (see Figure 25).

Respondents also prioritize research that they feel covers new ground. A very large share of respondents—more than 8 in 10—indicated that their perceptions of gaps in the existing research were very important in their selection of areas of research to pursue. Additionally, many respondents—about 8 in 10—indicated that the practicality or feasibility of a project is very important consideration when choosing which research areas to pursue. These three factors—academics’ own interests, their perceptions of gaps in the existing research, and the practicality or feasibility of a project—were rated as very important in the selection of areas of research to pursue by substantially more respondents than any other factor.

About half of our respondents rated a pair of additional practical factors—the availability of funding or the availability of opportunities to publish—as very important considerations in their selection of research directions. Several other factors—accessibility or reproducibility of needed data, images, or primary source materials; advice from peers; and promotion, REF, or other research assessment requirements—were all rated as very important by slightly less than half of respondents.

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17 “Patterns of information use and exchange: case studies of researchers in the life sciences,” Research Information Network and the British Library, 2009.

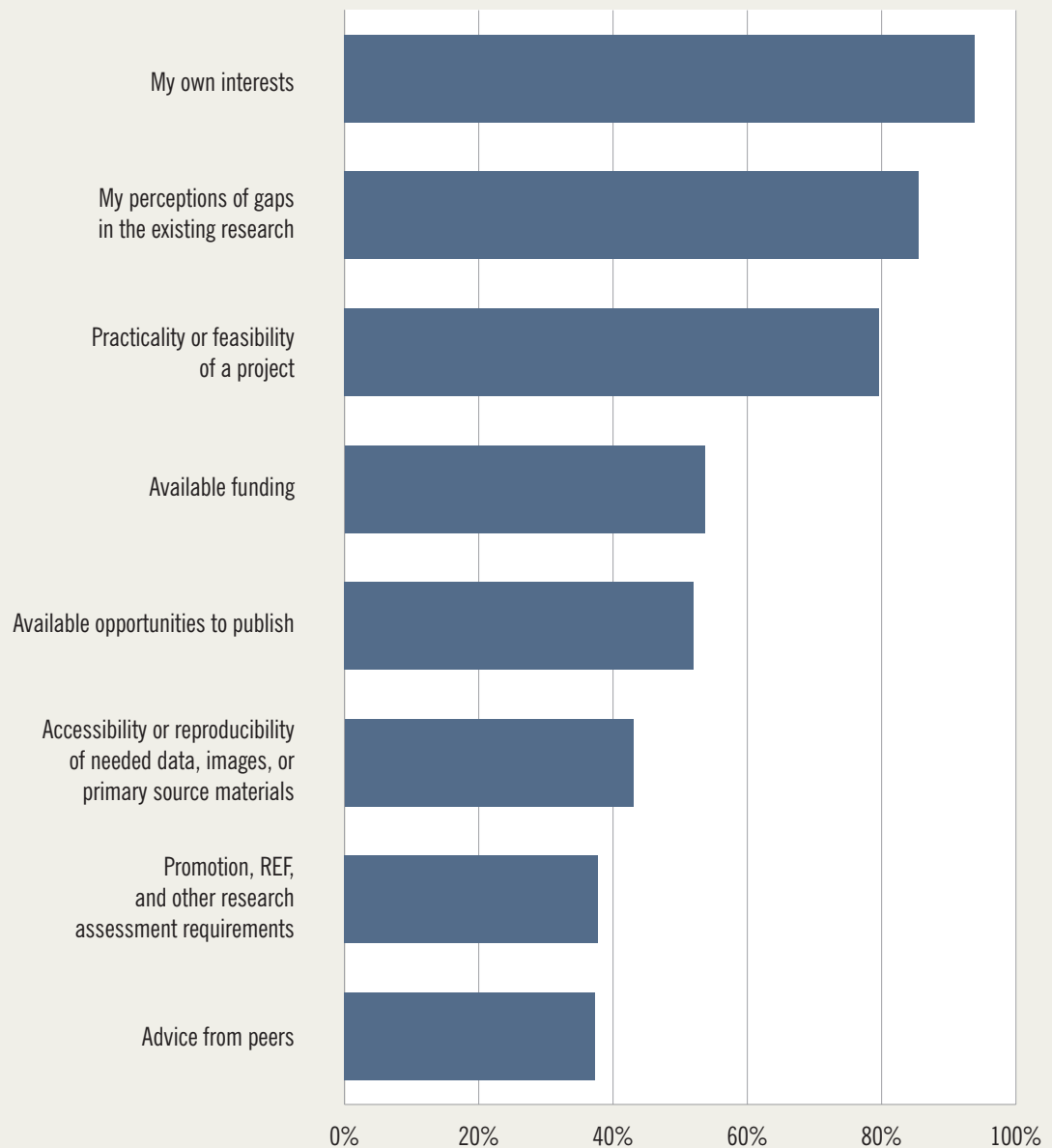
18 “Reinventing research? Information practices in the humanities,” Research Information Network, April 2011.

19 Roger C. Schonfeld and Jennifer Rutner, “Supporting the Changing Research Practices of Historians,” A Report by Ithaka S+R (December 7, 2012).

20 Matthew P. Long and Roger C. Schonfeld, “Supporting the Changing Research Practices of Chemists,” Ithaka S+R (February 26, 2013).

FIGURE 25

“When you think about new research projects or new research 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 the following is very important.



## Collaboration

Across the academy, there are well-worn disciplinary stereotypes—humanists are widely imagined as lone academics, working independently with little or no engagement with others, while scientists are characterized as working in large labs and releasing papers with lengthy lists of co-authors. In the humanities, there have been active efforts to change these perceptions, as many digital humanists in particular have made it a priority to recast humanities research as more deeply collaborative.<sup>21</sup> Among our respondents, 9 out of 10 reported that at some point in their career they have collaborated on a research project with at least one other academic. Among humanists, 8 out of 10 respondents reported that they have collaborated at some point. But while large shares of respondents in all disciplines reported collaborating at least once, the amount of collaborative research varies by discipline. About two-thirds of humanists agreed strongly with the statement “I principally pursue my research alone, with only occasional or informal engagement with other academics.” The share of respondents strongly agreeing with this statement in other disciplines was substantially smaller. About 2 out of 5 social scientist respondents strongly agreed with this statement, and less than 1 out of 5 scientists or medical/veterinary academics strongly agreed with this statement. These sharp differences seem to reinforce common perceptions of the disciplines, showing humanists to be less consistently collaborative than academics in other fields.

## Digital research activities and methodologies

Digital technologies have surely touched almost every researcher’s life, if only through a transition to accessing materials, communicating, and writing on the computer. But in some cases, the impact of digital technology has been truly transformative, such as by enabling analysis of massive and otherwise intractable datasets<sup>22</sup>, the development of sophisticated computer models, the engagement of the general public in “citizen science” efforts<sup>23</sup>, and a wide variety other new methods.<sup>24</sup>

To form a module of questions that would be appropriate 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, and asked respondents to rate the importance of these for their research (see Figure 26). This list is not meant to be normative but rather to explore a set of methods often said or hoped to be growing in frequency of use.

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21 “Reinventing research? Information practices in the humanities,” Research Information Network, April 2011.

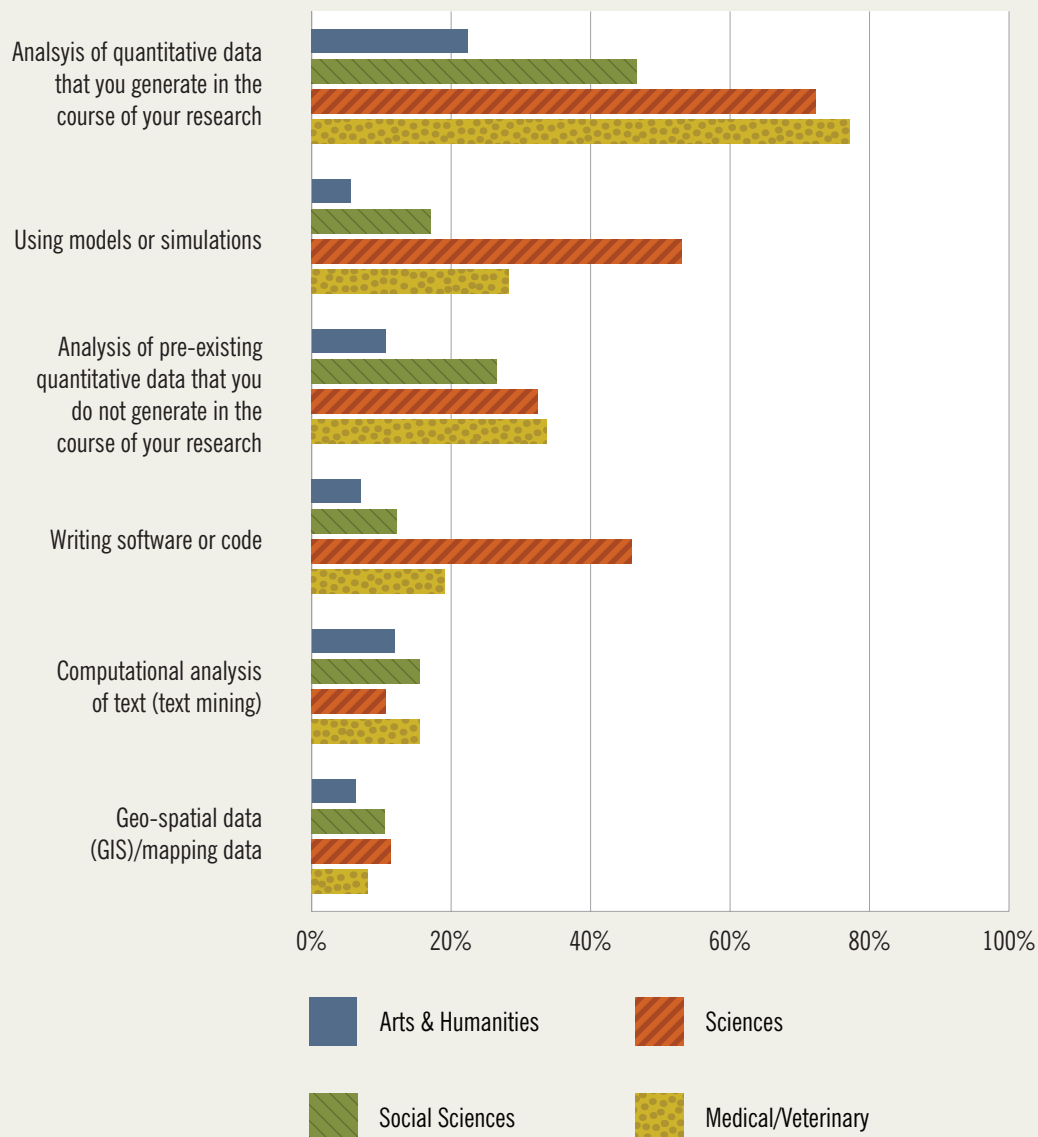
22 See for example the “Digging into data challenge,” administered for the UK by Jisc as part of an international funding partnership, <http://www.jisc.ac.uk/whatwedo/programmes/digitisation/diggingintodata.aspx>.

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

24 Liz Lyon, “Open Science at Web-Scale: Optimising Participation and Predictive Potential,” November 2009, available at <http://www.jisc.ac.uk/publications/reports/2009/opensciencercpt.aspx>.

FIGURE 26

“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.



Of the methods and activities that we asked about, the one that was rated as very important by the largest share of respondents in each disciplinary grouping—by a substantial margin—was the analysis of quantitative data that academics generate in the course of their research. Overall, about half of respondents rated this method as very important to their research. But while this option was rated as very important by a larger share than any other method or activity that we asked about, there were substantial differences between different disciplinary groupings. Among scientists and medical/veterinary academics, more than 7 out of



10 rated analysis of quantitative data generated in the course of research as very important, while about half of social scientist respondents and less than a quarter of humanists agreed.

Three other methods or activities were rated as very important by roughly a quarter of respondents, although with somewhat different patterns between disciplinary groupings. The analysis of pre-existing quantitative data that they do not generate in the course of their research was rated as very important by about a quarter to a third of respondents in each of the sciences, social sciences, and medical/veterinary fields. Although analysis of pre-existing quantitative data was rated as very important by about the same share of respondents in each field (excluding humanists), other methods saw more disciplinary divergence. Around half of respondents in the sciences rated both writing software or code and using models and simulations as very important to their research, while substantially smaller shares of respondents in other fields rated these methods or activities as very important.

The other methods and activities that we offered as options—computational analysis of text (text mining) and use of geo-spatial data (GIS) /mapping of data—were rated as very important by only about 10% of respondents.<sup>25</sup>

In addition to these broader findings on digital research methods and activities, further disciplinary differences are worth noting. Across the board, the share of scientists reporting that each method is very important to their research is equal to or greater than the share of academics in any other field. While about the same number of medical/veterinary academics rated both types of data analysis as important as did scientists, there was a larger gap between these two groups on several other methods. Also, the methods we listed clearly did not resonate widely with humanists. While about 25% of humanists rated the analysis of quantitative data generated in the course of their own research as very important, no other method was rated as very important by more than about 1 out of 10 humanists.

Finally, there were differences in the prevalence of these methods between RLUK and non-RLUK institutions. Although this might be expected due to the greater share of scientists at RLUK institutions, there remains a gap between institution types even when considering only scientists (see Figure 27).

We asked academics if they would like to “more deeply” integrate digital research activities and methodologies into their work. Overall, about 40% of respondents strongly agreed that they would like to do so, but there was some variation between responses in different disciplinary groupings. About half of scientist and medical/veterinary academics strongly agreed with this statement, compared to about 2 in 5 social scientists and a third of humanists.

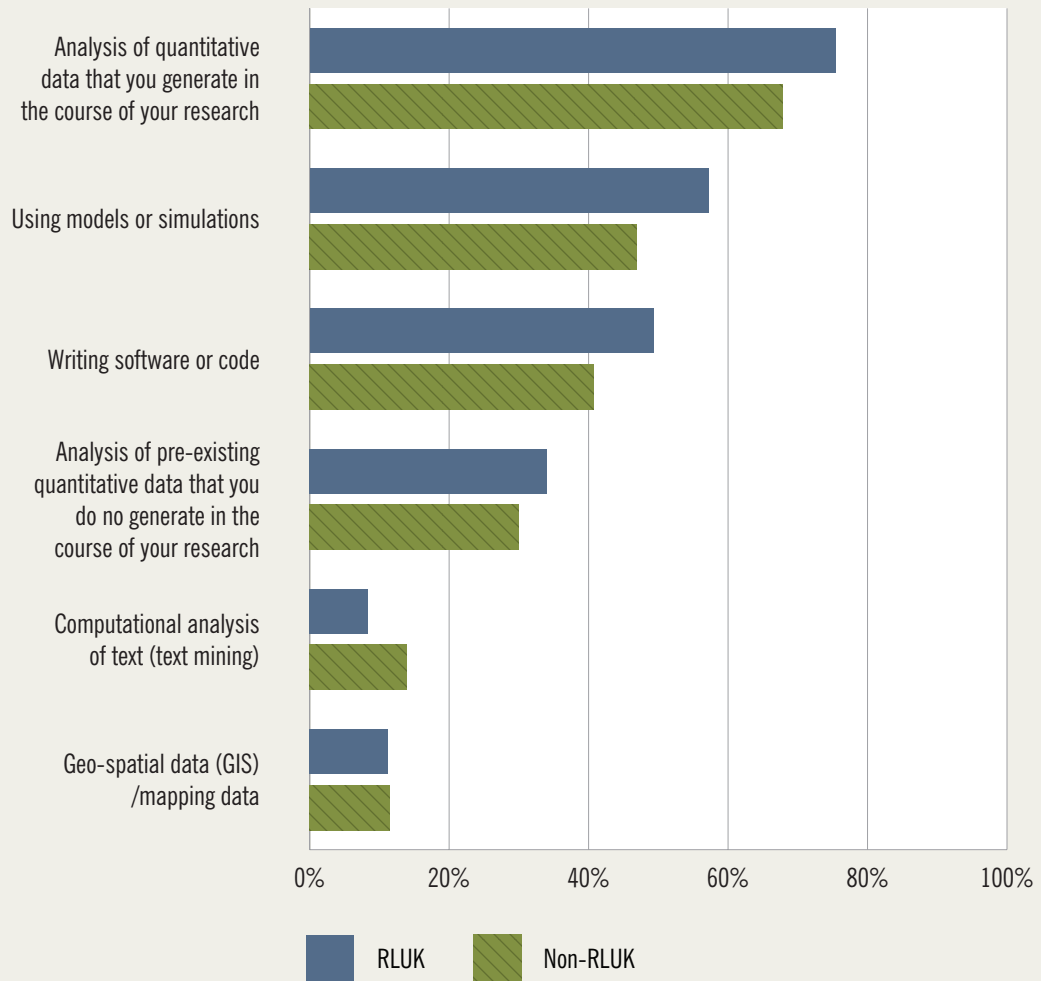
Interest in integrating digital research activities and methodologies is not necessarily sufficient to being able to actually do so; academics may require a variety of types of support in order to meaningfully integrate new practices into their

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25 For some of the challenges surrounding text-mining see Jisc, *The Value and Benefit of Text Mining to UK Further and Higher Education*, Digital Infrastructure (2012), <http://bit.ly/jisc-textm>.

FIGURE 27

“How important to your research is each of the following digital research activities and methodologies today?”  
Percent of *scientists* who indicated that each of these methods or activities is very important.

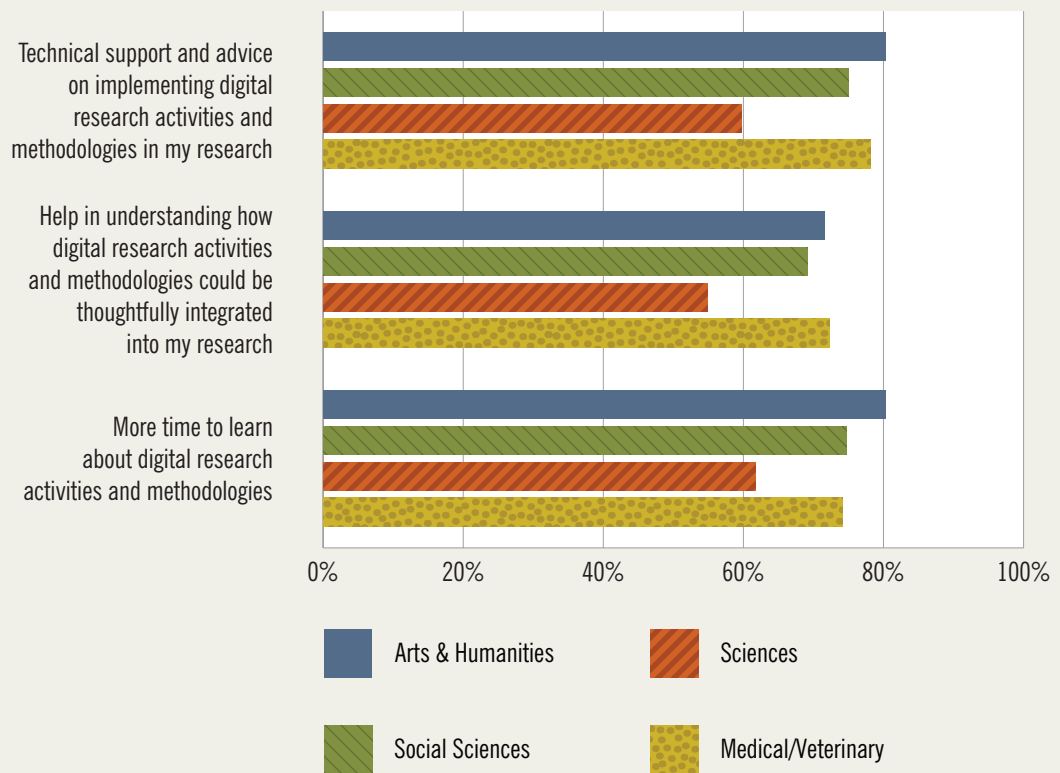


research. Both Jisc and Ithaka S+R are engaged in other research projects that focus on exploring academics’ specific needs for support services on a disciplinary level.<sup>26</sup> Responses to this survey suggest that academics require a variety of different types of support. We asked those who agreed strongly with the statement that they would like to more deeply integrate digital research activities and methodologies into their work to rate the importance of several potential types of assistance (see Figure 28). Approximately three quarters of respondents indicated that each of the three types of assistance we described—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

<sup>26</sup> See the Jisc “Virtual research environment programme,” <http://www.jisc.ac.uk/whatwedo/programmes/vre.aspx>. See also Ithaka S+R’s Research Support Services for Scholars program, <http://www.sr.ithaka.org/research-publications/research-support-services-scholars>.

FIGURE 28

“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 of respondents indicating that each of the following factors would be very important, by disciplinary grouping.

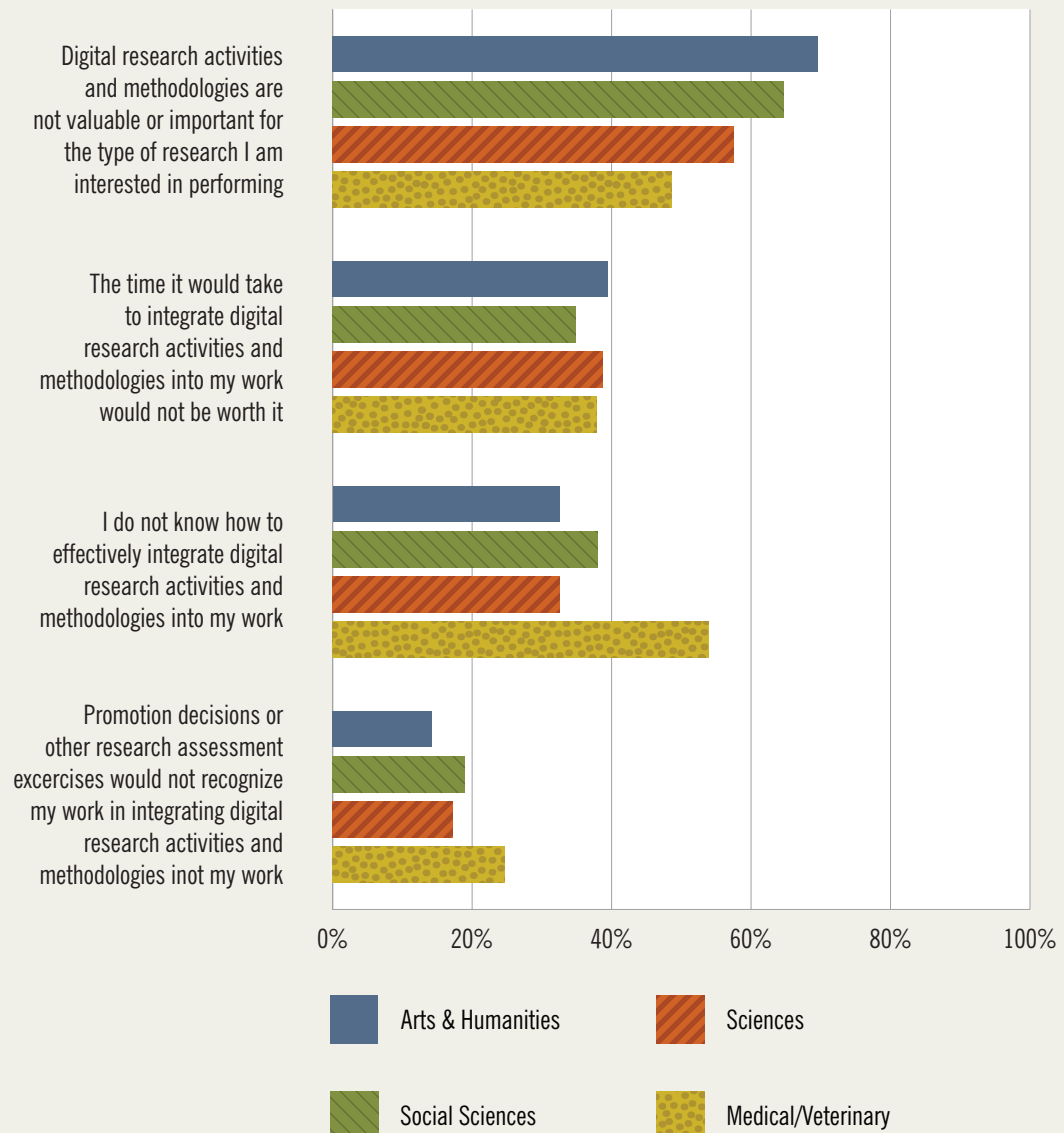


important in helping them to do so. Although there was some slight variation by disciplinary grouping (a somewhat smaller share of scientists agreed that each of these would be important) these were all rated as very important across the board.

We also asked those respondents who indicated they were *not* interested in more deeply integrating digital research activities and methodologies into their research to rate how important several reasons were for their lack of interest in doing so (see Figure 29). The reason rated as very important for this lack of interest by the largest share of these respondents (about two thirds of those who indicated they were not interested in more deeply integrating digital research activities and methodologies into their research) was that digital research activities and methodologies are not valuable or important for the type of research they are interested in performing. About one third attributed their lack of interest to a perception that the time it would take to integrate digital research activities and methodologies into their work would not be worth it, and about the same share indicated that they do not know how to integrate digital research activities and methodologies effectively into their work. A smaller share—slightly less than

FIGURE 29

“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 of respondents indicating that each of the following reasons would be very important, by disciplinary grouping.



20%—indicated that they are not interested in more deeply integrating digital research activities and methodologies because they felt that promotion decisions and other research assessment exercises would not recognize this kind of work.

There were some notable differences between disciplinary groupings on two of the potential reasons for a lack of interest in more deeply integrating digital activities and methods into research. The share of respondents that indicated that these methods are not valuable or important for the type of research they

are interested in performing was greatest in the arts and humanities, where almost 70% of those who indicated they were not interested in more deeply integrating these methods cited this as a motivating factor, with smaller shares in other fields. A second difference can be seen in medical/veterinary academics' responses. In all other fields, the perception that digital research activities and methodologies are not valuable or important for one's research was the most widely rated reason why academics were not interested in more deeply integrating these methods into their research, but among medical/veterinary academics, the largest share indicated that they lacked knowledge of *how* to effectively integrate these activities and methodologies into their research. This may indicate that a relatively larger share of medical/veterinary academics are interested in using more digital research activities and methodologies, but do not know how to do so effectively and would value support in this area.

## Undergraduate education

Technology is affecting teaching practices much as it has research practices, and academics 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, with major programmes like the Higher Education Academy/Jisc Open Educational Resources Programme (UKOER) seeking to support new models of learning and skills to support online learning.<sup>27</sup> These complement longer-standing distance education activities that have transitioned into the digital realm, such as the Open University's OpenLearn programme.<sup>28</sup> In the Survey of Academics, we have explored these issues from the instructor's perspective, to understand how technology-enabled pedagogies are being integrated into regular classroom teaching and how educational priorities such as research and critical thinking skills training can be 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, the types of materials they assign undergraduates, and their expectations of the students in their courses. Around three-quarters of respondents each reported teaching a first or second year undergraduate course or a third or fourth year undergraduate course in the past two years. A slightly higher share—8 out of 10—reported that they have taught a post-graduate taught course during this time, with teaching formats varied by field.<sup>29</sup> We asked respondents about their behaviour specific to either their first and second or third and fourth year undergraduate teaching, in order to identify relevant differences.

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 30 and Figure 31). The types of work assigned vary somewhat both by field and by whether the course is for first and second year undergraduates or those in the third and fourth years. Problem sets are far more commonly assigned in the sciences—for both first and second year and third and fourth year courses—than in other fields, while read-

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27 "Collaborate to compete: seizing the opportunity of online learning for UK higher education," A Report to HEFCE by the Online Learning Task Force (January, 2011), [http://www.hefce.ac.uk/media/hefce1/pubs/hefce/2011/1101/11\\_01.pdf](http://www.hefce.ac.uk/media/hefce1/pubs/hefce/2011/1101/11_01.pdf)

28 For OpenLearn, see <http://www.open.edu/openlearn/>.

29 Nearly all respondents who have taught either first and second year undergraduate courses or third and fourth year undergraduate courses in the past two years reported that their courses include lecture-format teaching, with a slightly smaller share of respondents teaching lectures to third or fourth year undergraduates (92%), than to first or second year undergraduates (96%). For those who teach first and second year undergraduates, slightly less than 9 out of 10 (87%) reported that their courses include seminars or discussion sections, while virtually all respondents who teach third or fourth year undergraduates reported using seminars or discussion. For first and second year students, around 4 out of 10 reported that they include laboratories in their teaching, and 1 out of 10 include laboratories for third and fourth year undergraduate courses. Laboratories were, as might be expected, substantially more common among scientists and medical/veterinary academics, although in both cases slightly more common in first and second year courses.

ing responses are more often assigned in non-science fields. Substantially greater shares of academics teaching third and fourth year courses assign research papers and presentations. Interestingly, this pattern does not seem to hold in the sciences; scientists teaching third and fourth year courses did not indicate any greater use of research papers or presentations, and the share assigning experiments was actually slightly smaller.

FIGURE 30

“How often do you assign each of the following types of coursework in the first and second year undergraduate courses you teach?” Percent of respondents who indicated that they assign each of these types of coursework “often” or “occasionally,” by disciplinary grouping.

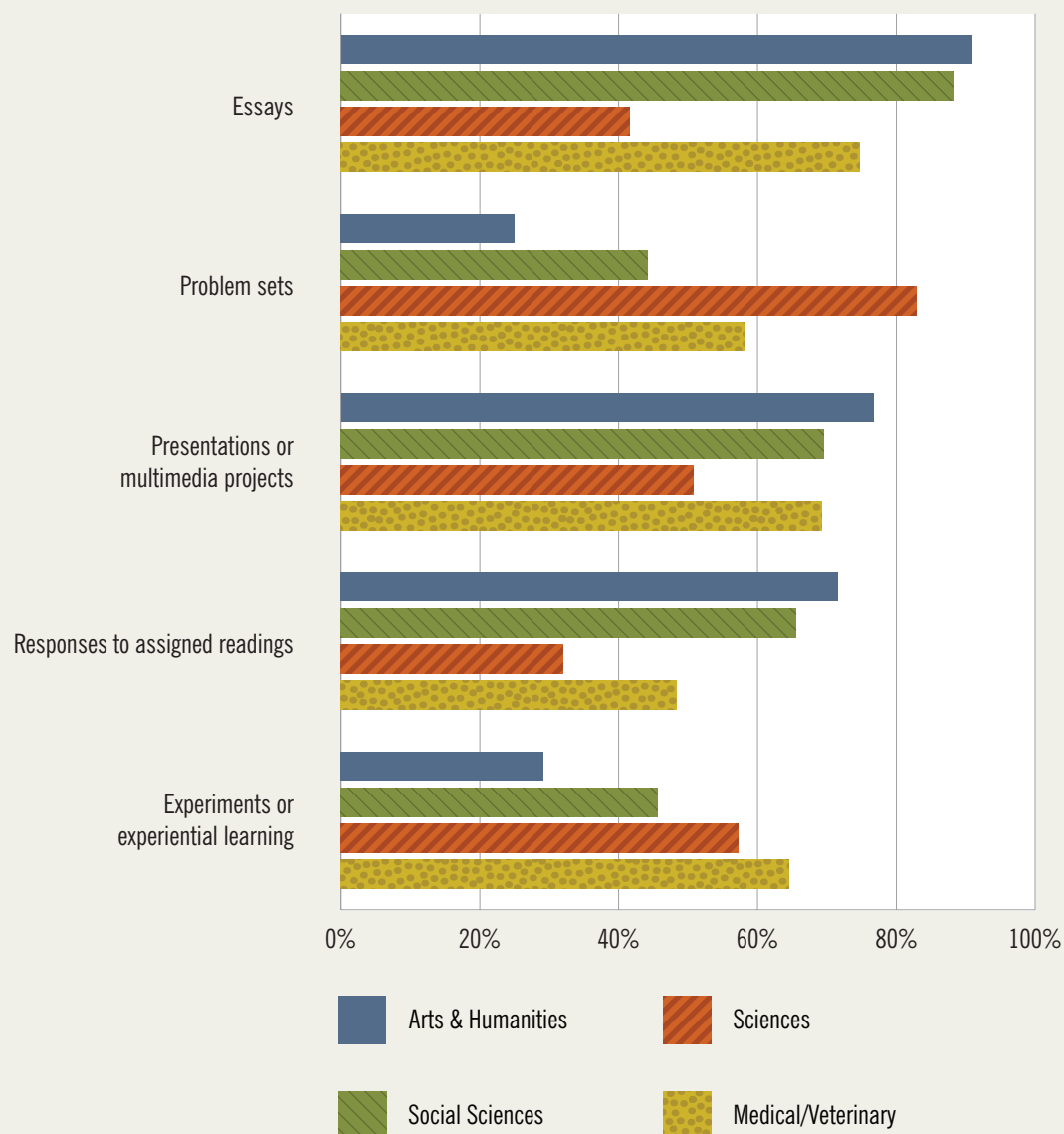
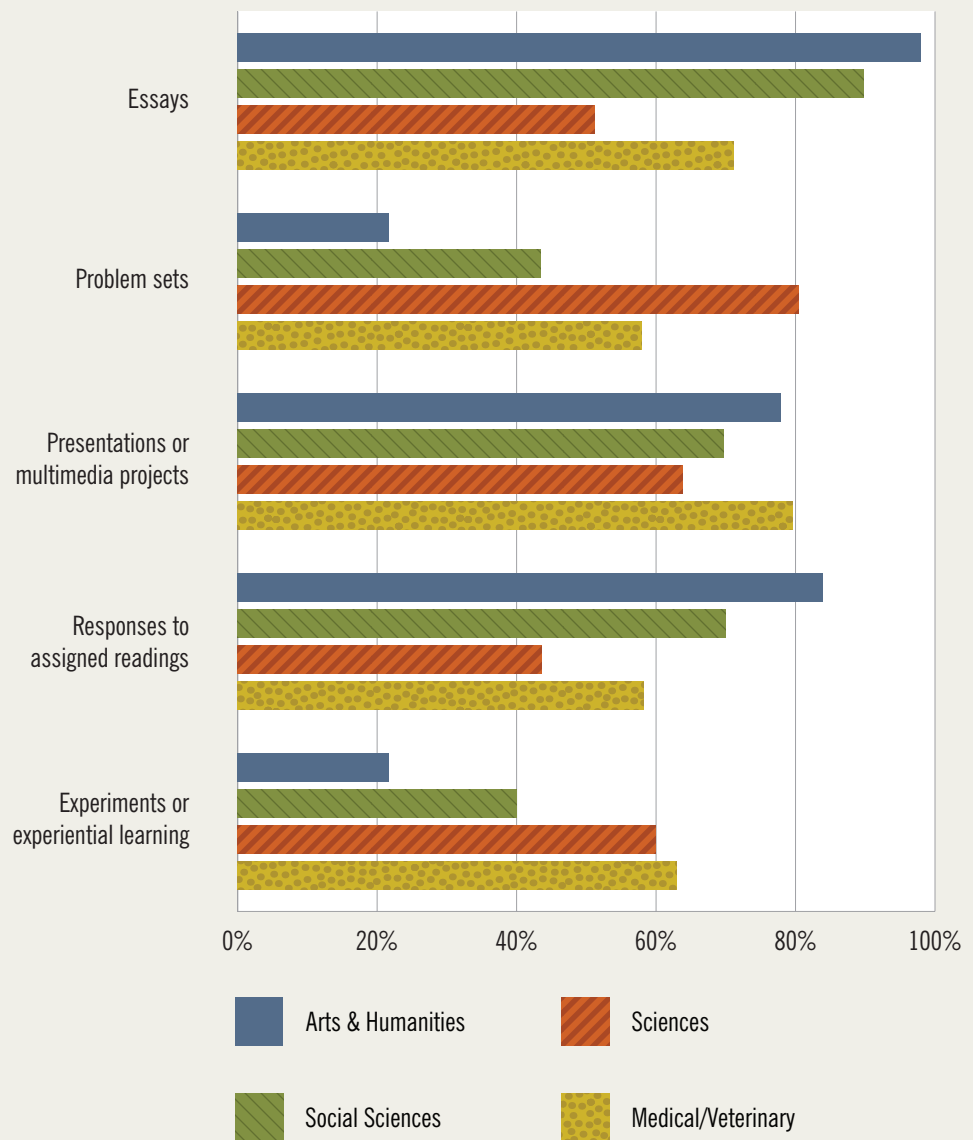


FIGURE 31

“How often do you assign each of the following types of coursework in the third and fourth year undergraduate courses you teach?” Percent of respondents who indicated that they assign each of these types of coursework “often” or “occasionally,” by disciplinary grouping.



Furthermore—and somewhat counter-intuitively, compared to the other disciplinary groupings, a substantially smaller share of scientists indicated that they regularly include undergraduate students in the research projects they lead. The share of academics that indicated that they regularly include undergraduates in their research was relatively larger—even among scientists—at RLUK institutions than at non-RLUK institutions.



## Use of technology-enabled pedagogies

Of the list of uses of technology in the classroom about which we asked, only a few were indicated to be practices that are used often or occasionally by a majority of respondents (see Figure 32, Figure 33). A majority of respondents indicated that they often or occasionally show videos in the classroom, either as one component of a lecture or discussion or as a replacement for one of them, and a majority also indicate they often or occasionally use “email lists or discussion boards on a course management system” to facilitate collaboration and discussion beyond the classroom.<sup>30</sup>

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30 The question about email lists were separate from the list presented in the graph, and so these numbers do not appear on the graphs.

FIGURE 32

“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.”

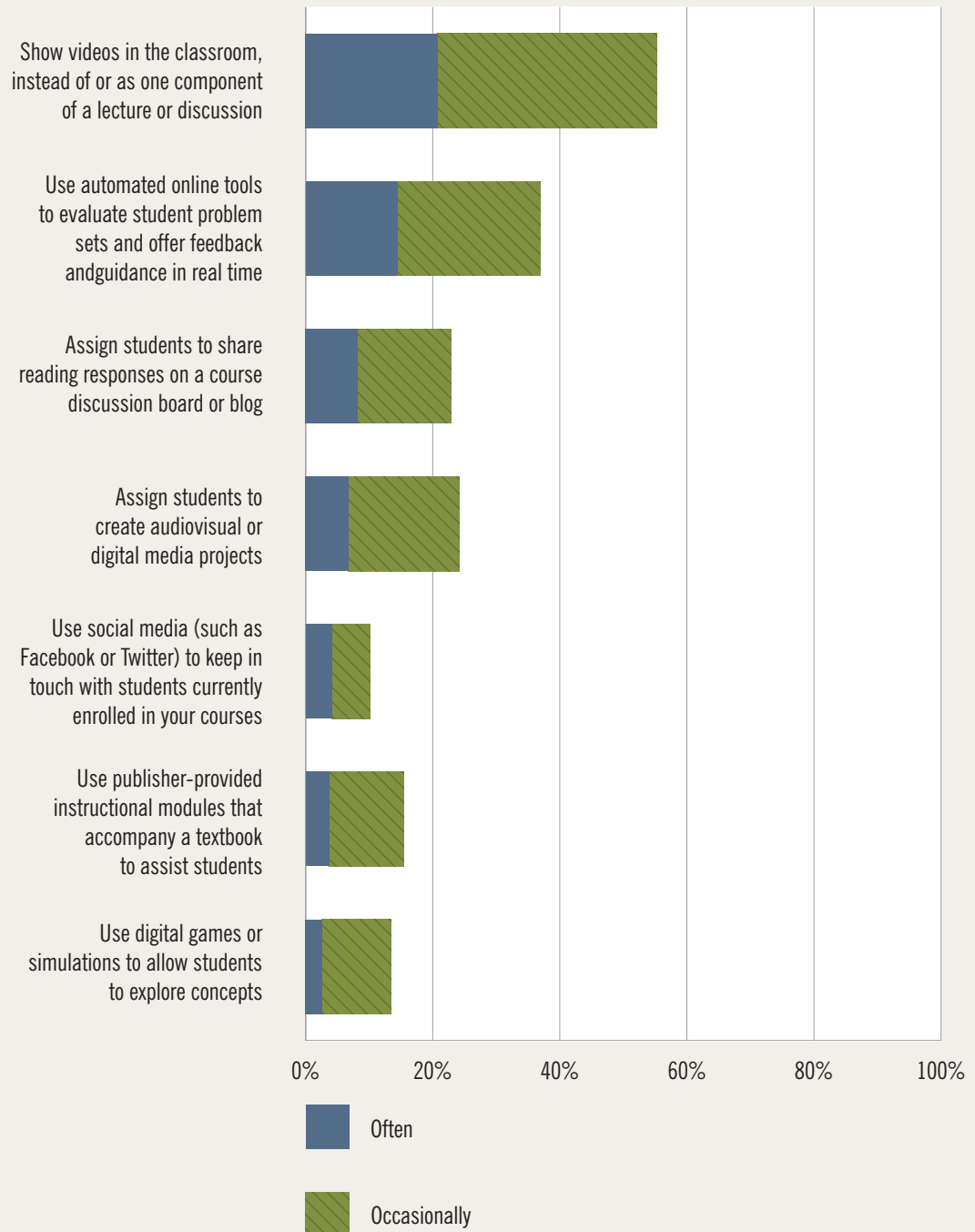
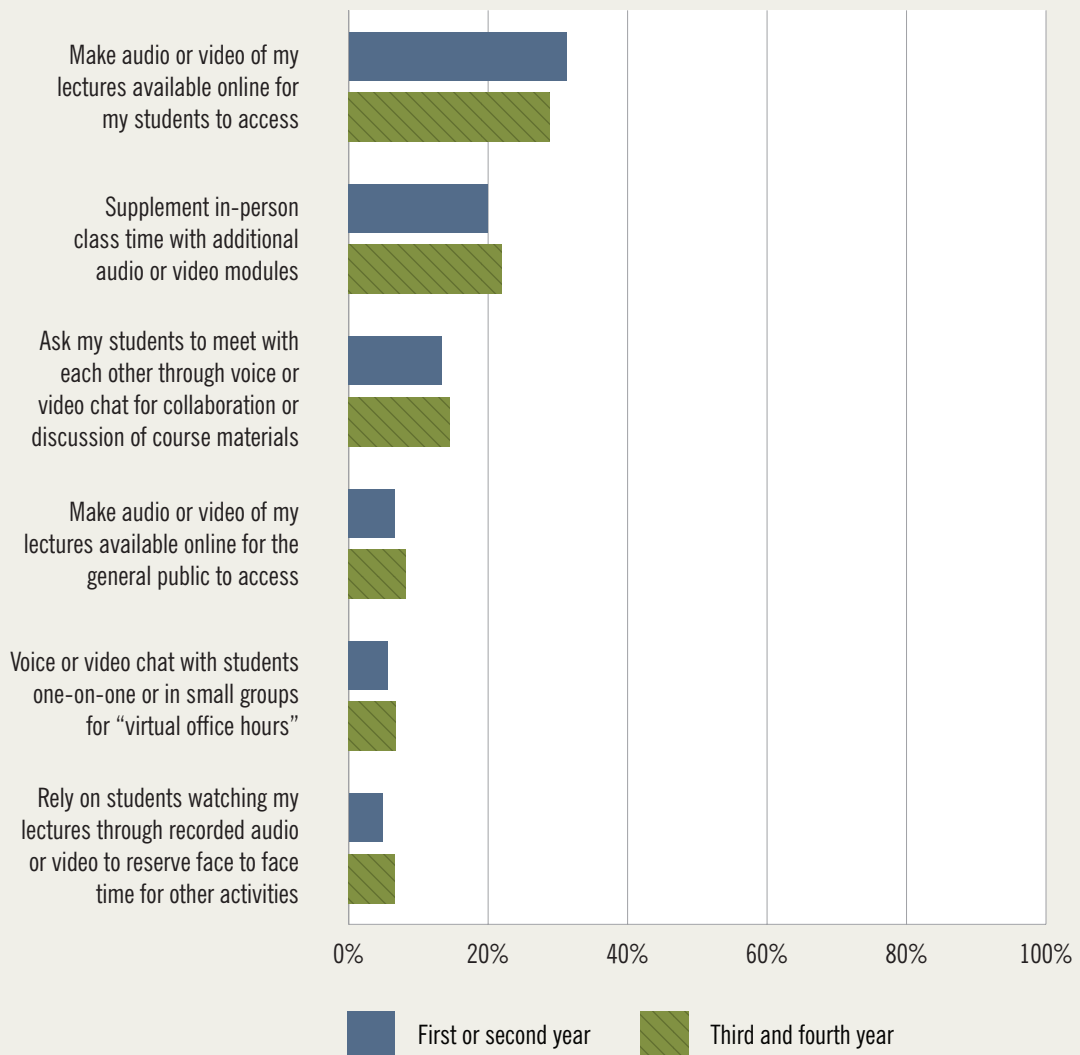


FIGURE 33

“Whether you do it yourself or you are supported by a college or university service in doing so, how often do you utilise each of the following techniques in your [first and second year | third and fourth year] undergraduate courses—often, occasionally, rarely, or never?” Percent responding “often” or “occasionally”.



Academics use a host of other technologies at varying levels of regularity. Roughly 15 to 40 percent of respondents indicated that they often or occasionally use each of the other approaches listed. One of the more commonly used approaches was using automated online tools to evaluate student performance, an approach that is substantially more common in the sciences and medical/veterinary fields than in the arts and humanities or social sciences. Another was making audio and video of their lectures available online for their students to view, although substantially fewer indicated that they rely on students to watch recorded lectures in order to reserve face to face time for other activities (sometimes known as “flipping the classroom”). A similarly small share indicated that they make audio or video of their lectures available online for the general public

to access. Other approaches—including assigning students to share reading responses on a course blog, assigning them to create audiovisual or digital media projects, or using publisher-provided instructional modules that accompany a textbook, making themselves available for voice or video chat (“virtual office hours”), using digital games or simulations in the classroom, keeping in touch with their current students through social media, or asking students to meet with each other using voice or video chat for collaboration or discussion—were only indicated to be often or occasionally used by a relatively small number of respondents.

There is some moderate disciplinary variation here, related to the underlying types of work—a larger share of scientists often employ automated evaluation of problem sets, while a smaller share asks students to share reading responses online, which mirrors their overall pattern of use of problem sets and reading responses as types of assignments. Across the board, these teaching practices are less common at RLUK institutions than they are at non-RLUK institutions (see Figure 34, Figure 35). This is perhaps partially explained by the fact that the share of respondents who strongly agree that their 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” is slightly larger at non-RLUK institutions than at RLUK institutions.

FIGURE 34

"Whether you do it yourself or you are supported by a college or university service in doing so, how often do you utilise each of the following techniques in your [first and second year | third and fourth year] undergraduate courses - often, occasionally, rarely, or never?" Percent responding "often" or "occasionally," combining first and second year responses with third and fourth year responses, by institution type.

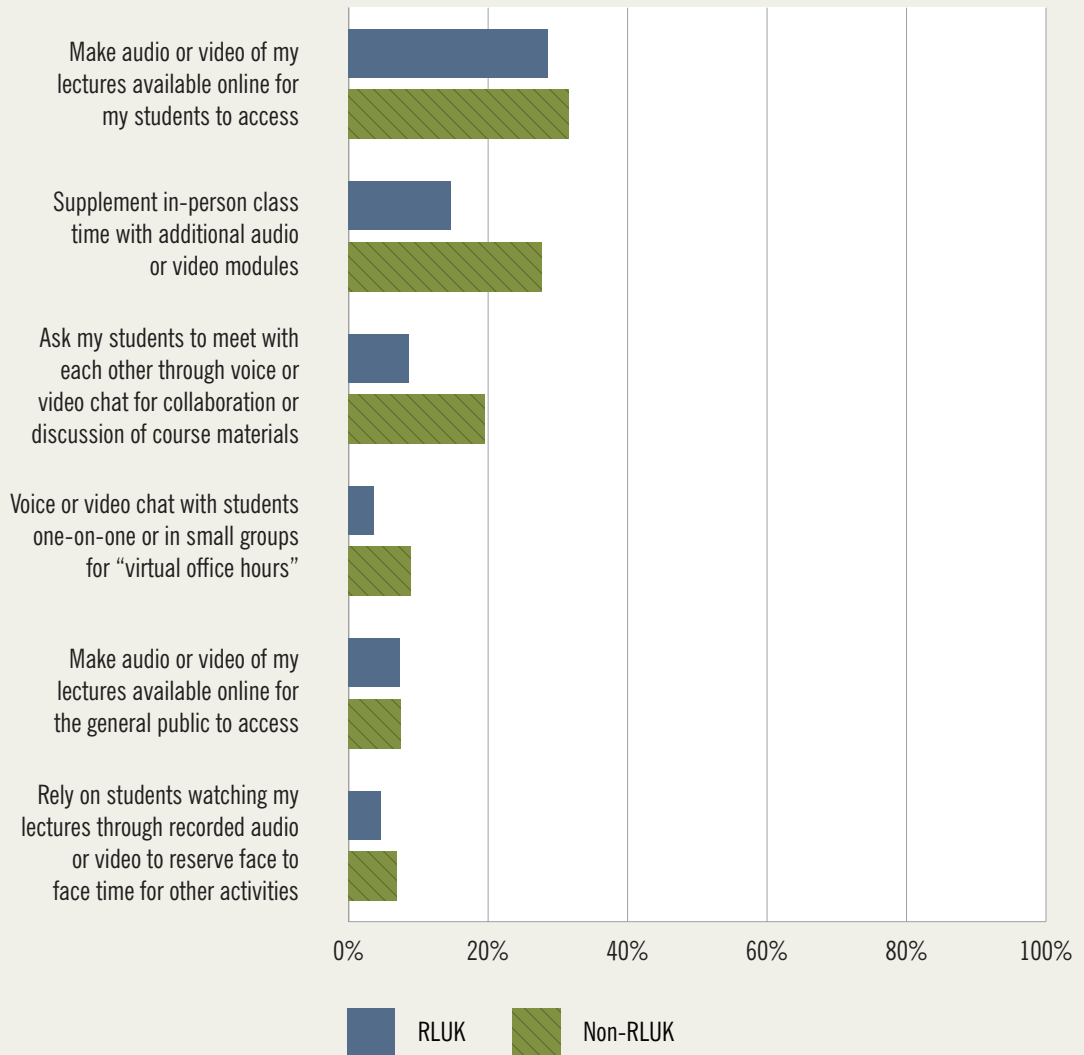
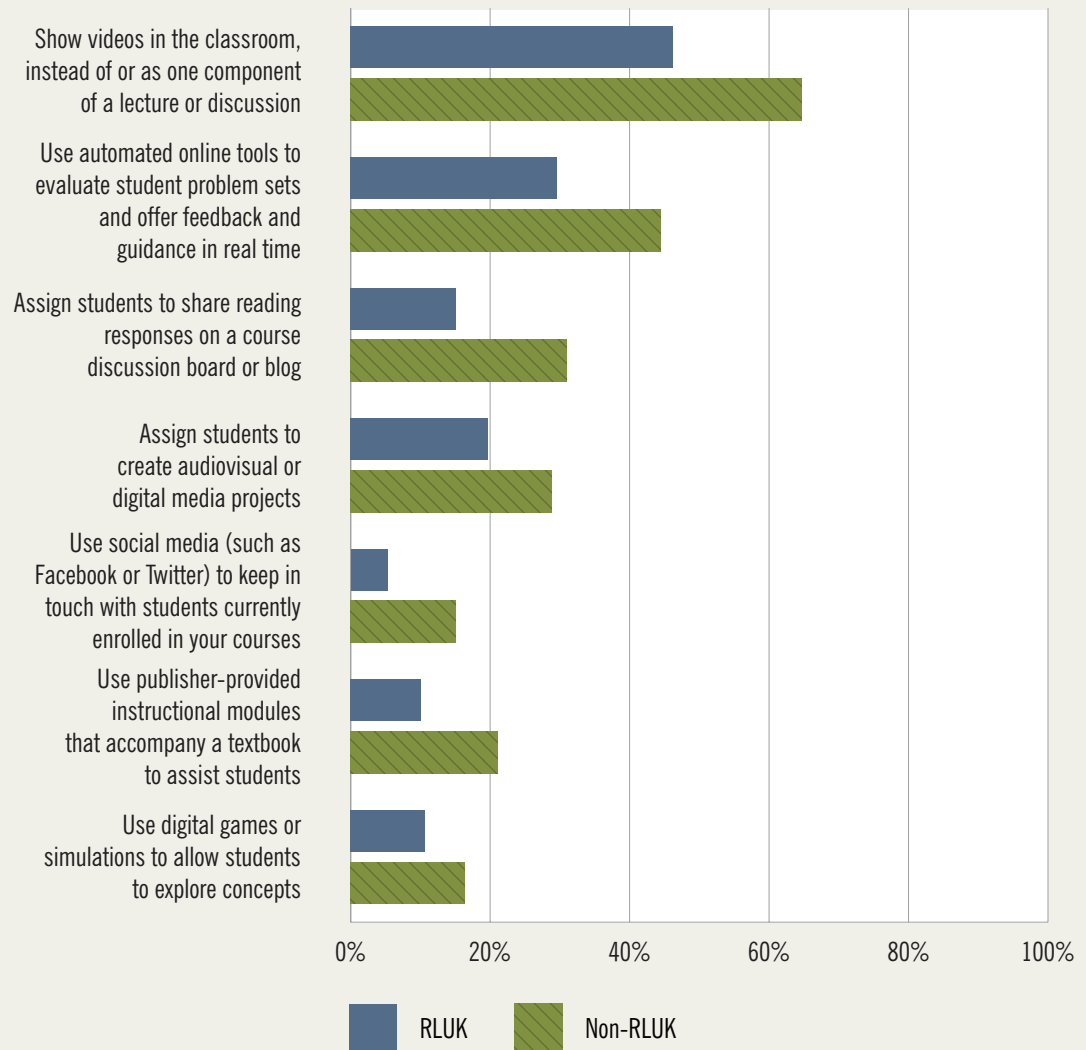


FIGURE 35

"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 technologies 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?"



or digital media projects, or using publisher-provided instructional modules that accompany a textbook. There is some moderate disciplinary variation here, related to the underlying types of work—a larger share of scientists often employ automated evaluation of problem sets, while a smaller share asks students to share reading responses online, which mirrors their overall pattern of use of problem sets and reading responses as types of assignments. Smaller shares of academics 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 through social media, or ask students to meet with each other using voice or video chat for collaboration or discussion. In all cases, the share of academics who employ these methods is relatively low, with particularly small shares who indicated that they “often” do so.

Across the board, these teaching practices are less common at RLUK institutions than they are at non-RLUK institutions (see Figure 34, Figure 35), perhaps partially explained by the fact that the share of respondents who strongly agree that their 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” is slightly larger at non-RLUK institutions than at RLUK institutions.

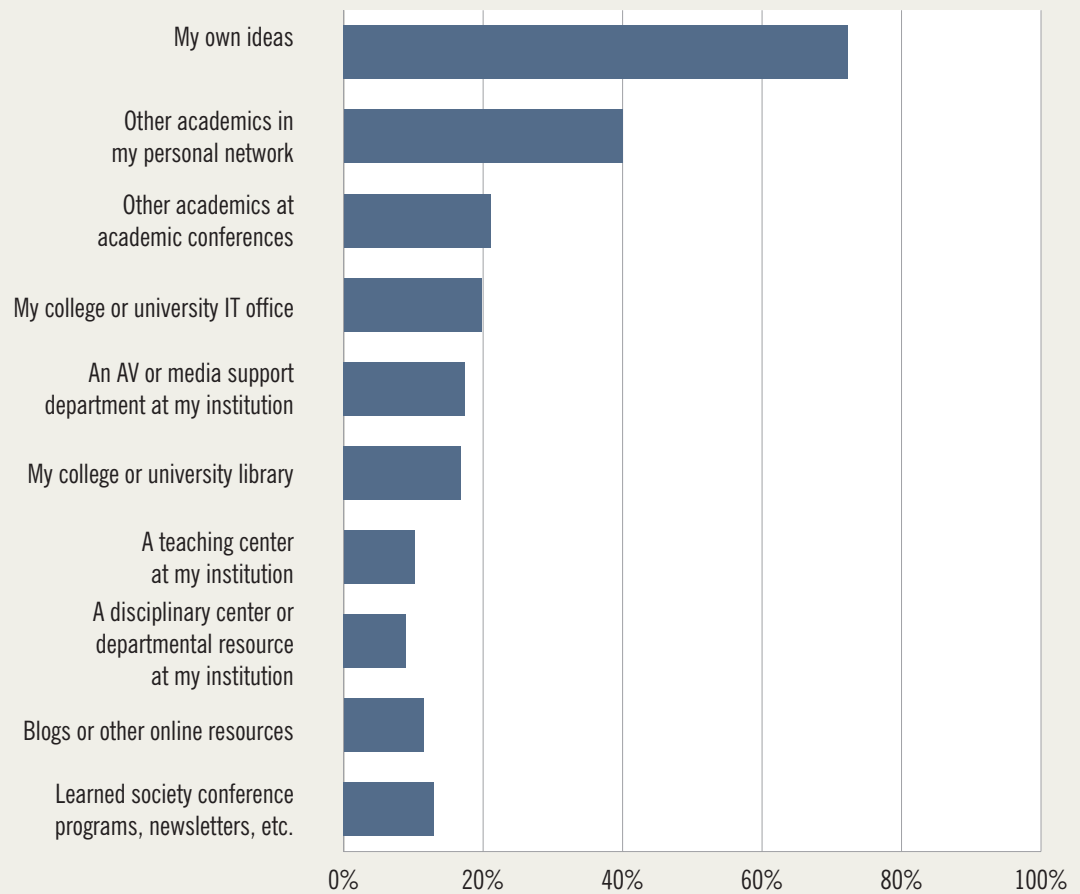
## Support for technology-enabled pedagogies

Just as academics 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 15% of respondents agreed with the statement that their institution “recognizes or rewards academic staff for taking the time to integrate new digital technology and pedagogies,” which suggests that those who are not intrinsically interested in experimenting with technology-enabled pedagogies may not feel highly motivated to do so.

The share of respondents who reported relying heavily on institutional sources for support was relatively low (see Figure 36); fewer than 1 out of 5 reported that they rely on their college or university library, their college or university IT office, or media support departments. Even fewer reported that they rely on teaching centres or disciplinary centres at their institution. When it comes to resources beyond their institution, around 1 in 5 reported that they rely heavily on “other academics at academic conferences,” with a much smaller share relying on “learned society conference programs, newsletters, etc.,” or “blogs or other online resources.” Instead of these formal resources, most academics reported relying on their “own ideas,” and 2 out of 5 reported relying on “other academics in their personal network.”

FIGURE 36

“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 indicating that they rely heavily on each of these possible sources





## Developing student research skills

In addition to these 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 subject. Examples include cultural diversity, quantitative reasoning, research skills, and critical thinking. A topic that has been identified as a particular priority by the library community has been “information literacy,” or “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner.”<sup>31</sup>

Overall, respondents indicated a fair level of comfort that their students are able to find and use research information; less than 3 out of 10 respondents agreed with the statement “my undergraduate students have poor skills related to locating and evaluating research information.”

Responses to our questionnaire did not clearly indicate how students should develop these skills. Slightly less than 40% agreed strongly that “developing the research skills of my undergraduate students related to locating and evaluating research information is principally my responsibility,” and only about 15% of respondents agreed that “developing the research skills of my undergraduate students related to locating and evaluating research information is principally my academic library’s responsibility.” While most did not agree that developing research skills was primarily the library’s responsibility, about 40% of respondents agreed that librarians help students to “develop their research skills,” and about half agreed that libraries “contribute significantly to [their] students’ learning by helping them to find, access, and make use of a range of secondary and primary sources in their coursework.” A substantially smaller share of respondents in the sciences agreed strongly with both statements than did academics in other fields.

Over two-thirds of respondents indicated that they believe 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. In both cases, a smaller proportion of scientists than other academics indicated that they believed their students engaged with librarians and that they believed that interacting with librarians helped students succeed.

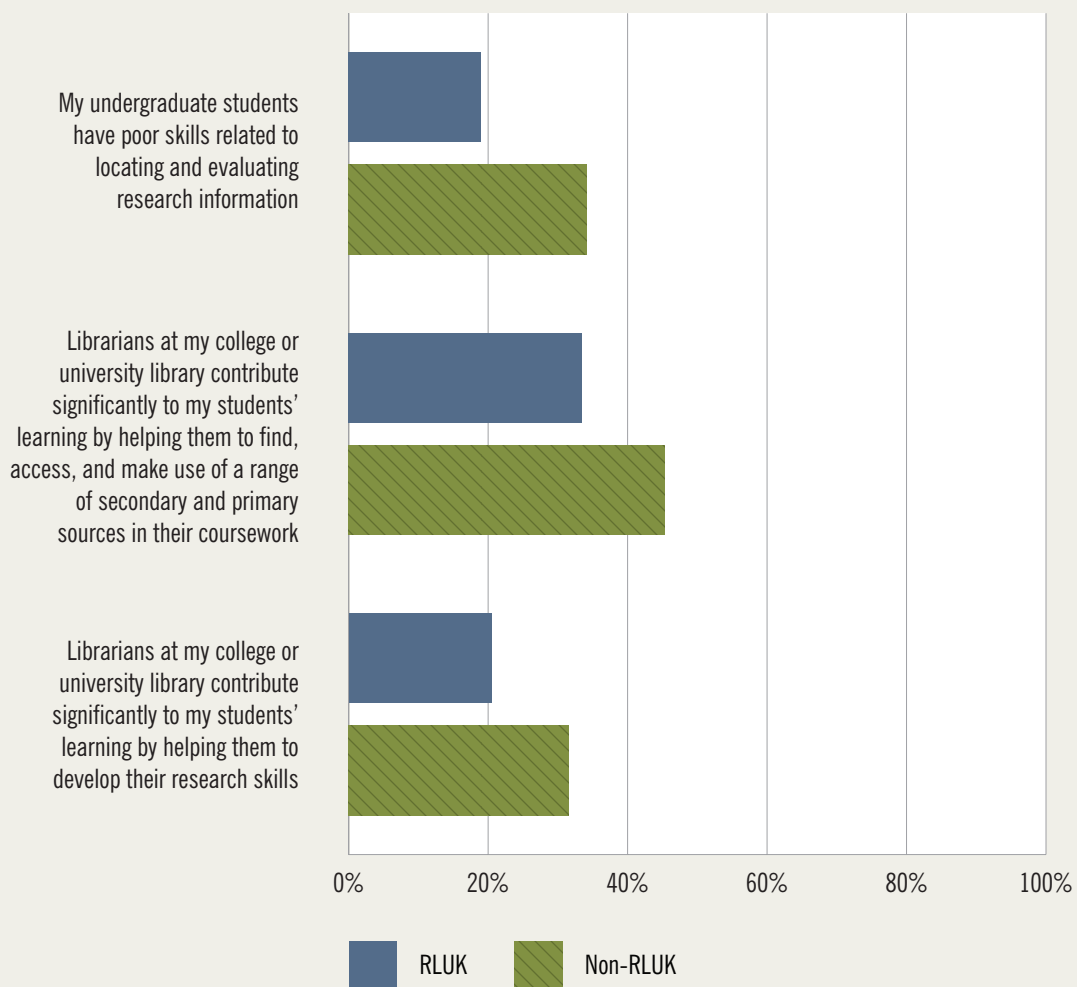
Respondents at non-RLUK institutions responded to these questions somewhat differently than respondents at RLUK institutions. While the share of respondents who strongly agreed that their undergraduate students have poor skills related to locating and evaluating research information was larger at non-RLUK institutions than at RLUK institutions, so was the share of respondents agreeing that librarians contribute significantly to student learning in several ways (see Figure 37).

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31 “Information literacy: definition.” Chartered Institute of Library and Information Professionals (CILIP), <http://www.cilip.org.uk/get-involved/advocacy/information-literacy/Pages/definition.aspx>. See also Jisc’s “Developing digital literacies” programme, <http://www.jisc.ac.uk/developingdigitalliteracies>.

FIGURE 37

Percent of respondents agreeing strongly with each statement, by institution type



## Research dissemination

It is difficult to overstate the impact—both actual and future potential—of digital technologies on the ways in which scholars communicate with each other. As traditional scholarly communications media—journals, and increasingly books as well—have been made available online, the marketplace for these materials has changed significantly. Recently, the Finch report and the Research Councils UK Policy on Open Access have set the UK academy on a trajectory towards a substantially greater focus on open access publication, with potentially far-reaching implications for the academic publishing marketplace and for academics.<sup>32</sup> New media and variations on traditional formats have offered up new opportunities for communication among scholars. In the UK, the incentive structure for academic publishing is relatively clearly defined through the Research Excellence Framework,<sup>33</sup> which shapes publishing choices by providing guidance to academics on how their publication choices will be evaluated.<sup>34</sup>

## Audience

To shed light onto the various audiences that academics may seek to reach, we asked respondents how important it is to them that their work reaches different types of audiences, from academics in their specific subdiscipline to a general audience (see Figure 38). Not surprisingly, their responses clearly indicate that academics in their immediate field are the audience most widely viewed as important, with those beyond their immediate niche rated as very important by smaller shares of respondents. Virtually all respondents indicated that it is very important to them that they reach academics in their own subdiscipline or field of research, and about 4 out of 5 respondents also identified academics in their broader discipline (but outside of their specific subdiscipline or field of research) as an important audience. Far fewer—about 40% of respondents—indicated that academics outside of their discipline were a very important audience, and a slightly smaller share indicated undergraduates to be a very important audience. An especially small share of academics in the sciences indicated undergraduates to be an important audience, while more than half of humanists indicated that undergraduates are an important audience.

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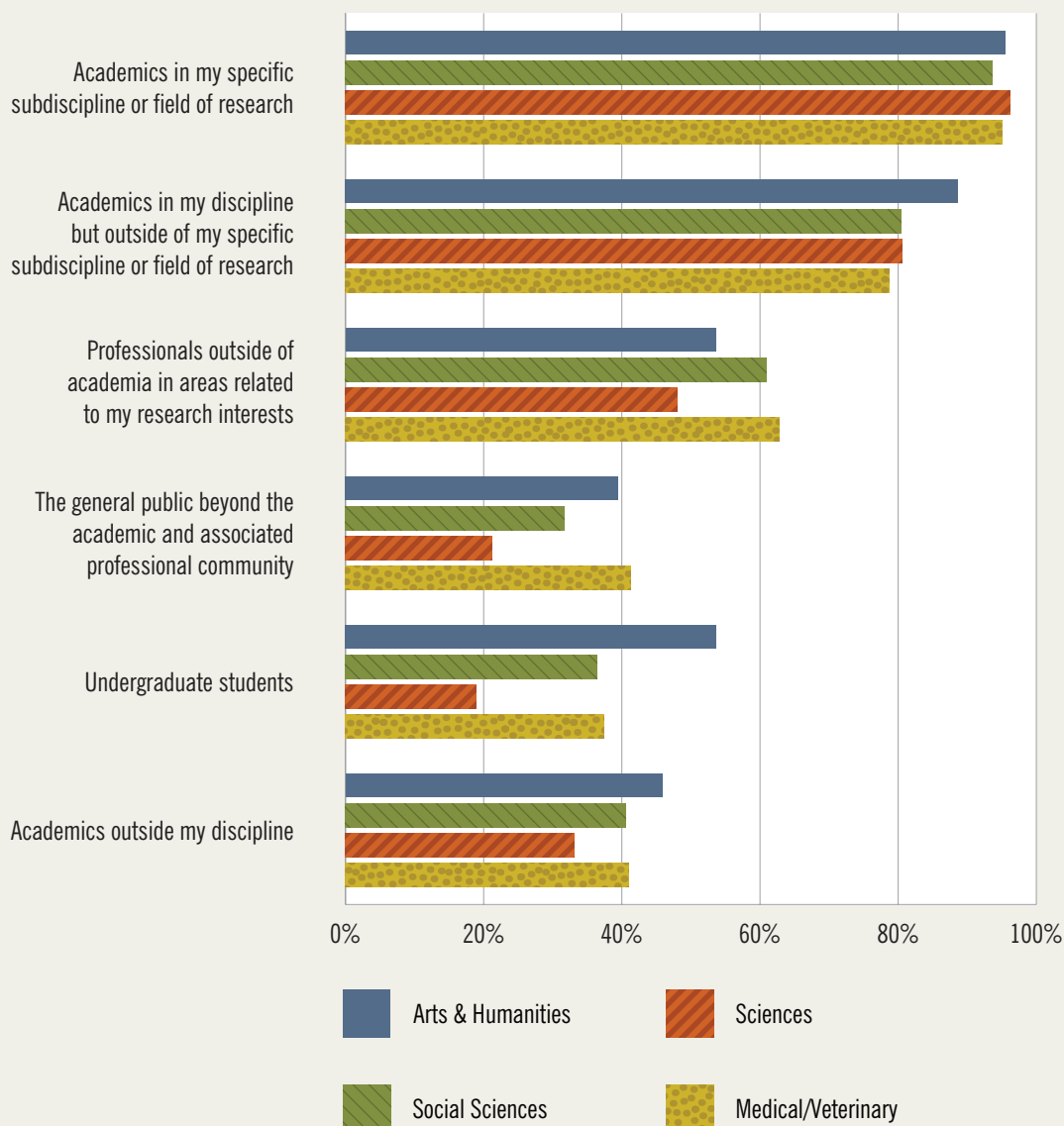
32 “Accessibility, sustainability, excellence: how to expand access to research publications.” Report of the Working Group on Expanding Access to Published Research Findings, 2012. See also the consultation on “Open access to publicly funded research,” published by the Higher Education Funding Council for England (HEFCE), <http://www.hefce.ac.uk/whatwedo/rsrch/rinfrastruct/openaccess/>.

33 Andy Miah, “Ref2014: what should researchers be concentrating on?” The Guardian Higher Education Network, February 2012, <http://www.guardian.co.uk/higher-education-network/blog/2012/feb/21/ref2014-what-researchers-concentrating-on>.

34 Katharine Reeve, “Bound for glory.” Times Higher Education, 2010, <http://www.timeshighereducation.co.uk/story.asp?storycode=412797>; RCUK Policy on Open Access and Supporting Guidance, <http://www.rcuk.ac.uk/documents/documents/RCUKOpenAccessPolicy.pdf>.

FIGURE 38

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



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.<sup>35</sup> 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 rated as a very important audience by slightly larger shares of social scientists and medical/vet-

<sup>35</sup> See especially “Innovation and research strategy for growth,” a report by the Department for Business Innovation & Skills (December, 2011), <http://www.bis.gov.uk/assets/biscore/innovation/docs/i/11-1387-innovation-and-research-strategy-for-growth.pdf>. See also the “National co-ordinating centre for public engagement,” <http://www.publicengagement.ac.uk/>.

erinary academics than humanists or scientists, presumably reflecting the strong connections between many social scientists' work and current policy issues and the connection of medical/veterinary research to medical practice. But only a relatively small share of respondents—about 30%—identified the general public *beyond* the academic and associated professional community as a key audience. Scientists in particular ranked the general public poorly as an audience.

## Publication choices

As academics reported that their immediate peers are a key audience, it is unsurprising that their choices in the publication process largely reflect this prioritization. Responses about the formats in which academics publish largely mirrored the disciplinary patterns in their responses about the formats that they read. Respondents clearly indicated that the long-established formats of academic journal articles, monographs, and conference proceedings are widely important, although with the following disciplinary differences (see Figure 39):

- Almost all respondents indicated that they had shared the findings of their research in peer-reviewed journals either “often” or “occasionally” in the past five years, with little disciplinary variation.
- Roughly three-quarters of respondents indicated that they have shared the findings of their research in published conference proceedings either “often” or “occasionally” in the last five years. Although this practice was slightly more prevalent in the sciences and medical/veterinary fields, it was common in all disciplinary groupings.
- About two-thirds of respondents overall indicated that they had “often” or “occasionally” shared the findings of their research in monographs or edited volumes published by an academic publisher, with disciplinary variation that mirrored the importance of these material types to the field; almost as many humanists indicated that they “often” or “occasionally” share their research through monographs or edited volumes as indicated that they do so through peer-reviewed journals, while substantially smaller shares of scientists or medical/veterinary academics publish in this format.
- Other formats for sharing research findings are substantially less common; substantially fewer respondents reported that they often or occasionally publish their work in magazines, trade journals, trade books, blogs/social media, or other digital publications, although with some disciplinary differences.

Peer-reviewed journals are almost ubiquitous across disciplines, and are essential sources of information for academics in their research. But even within the journal literature, academics indicated clear priorities that drive their choices of where to publish (see Figure 40). Three factors—all closely related to the prominence and reach of the publication—were rated as very important by more than 4 in 5 respondents: that the current issues of the journal are circulated

FIGURE 39

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

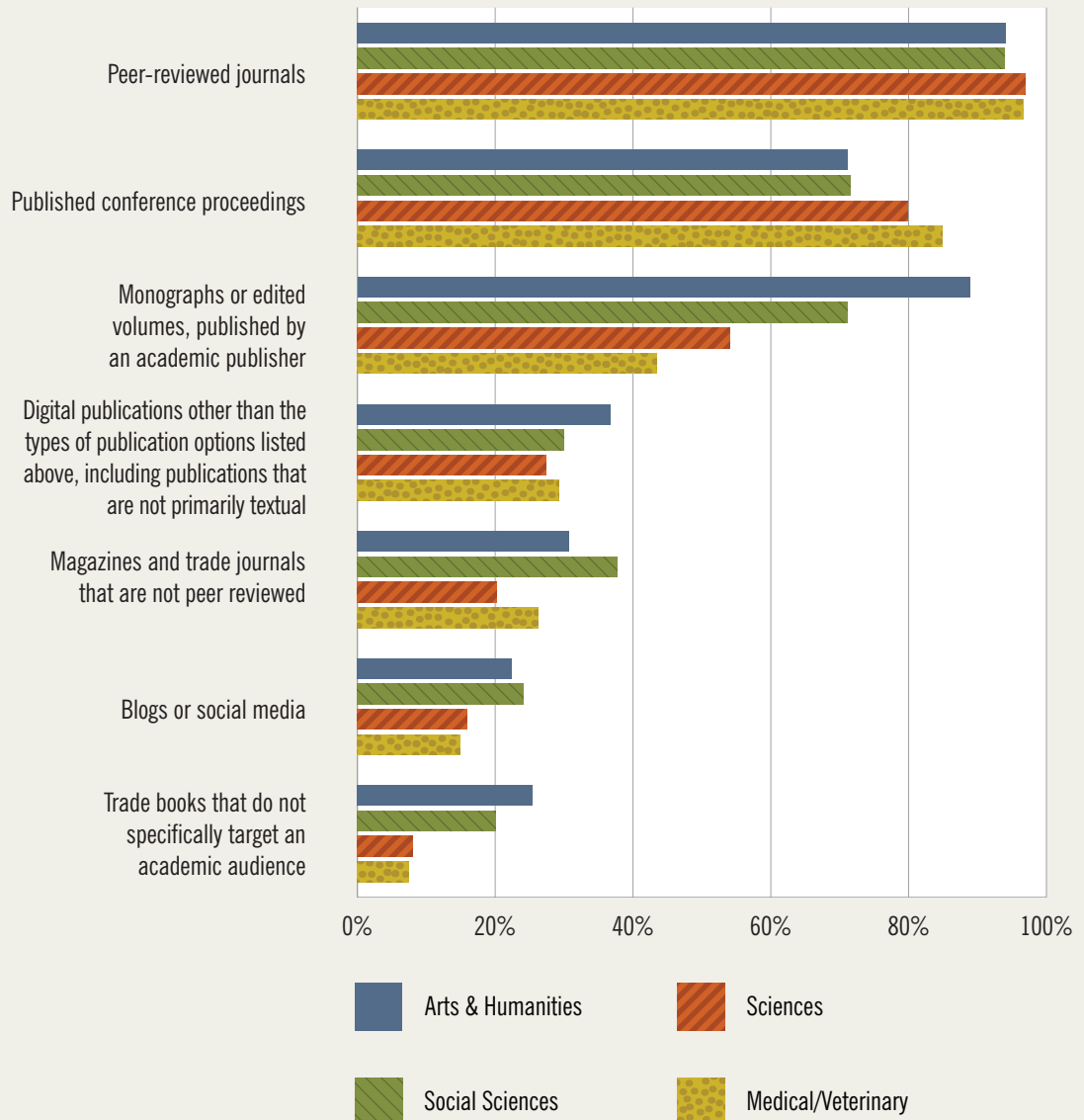
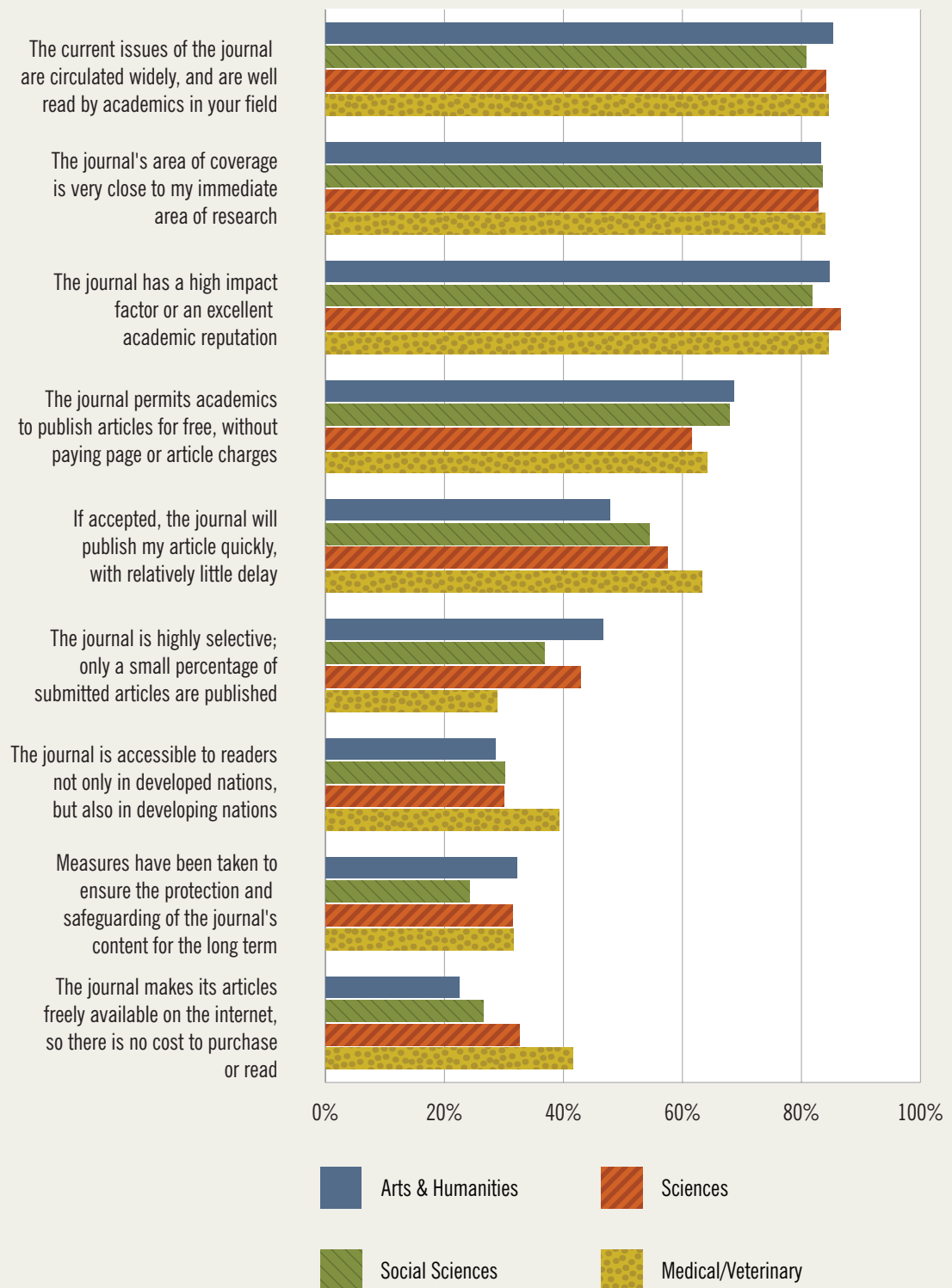


FIGURE 40

"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, by disciplinary grouping.



widely, are well read by academics in their field, and have a high impact factor. But prominence is not the sole factor driving publication venue choice; a similarly large share of respondents also indicated that it is very important to them to select journals whose area of coverage is very close to their immediate area of research, which probably reflects the prioritization of academics within one's own subdiscipline described above.

Factors related to the convenience of the author were also rated as important by a majority of respondents. About two-thirds of respondents rated the journal's policy of allowing academics to publish for free as a very significant factor in deciding where to publish, and slightly over half also reported that the journal's ability to publish quickly was an important factor as well.

Other factors were less widely rated as very important. About 2 in 5 respondents indicated it is very important to them that a journal be highly selective, with relatively smaller shares of medical/veterinary academics who cited this as an important characteristic. And other factors—the journal's accessibility in developing nations, measures taken to ensure the protection and safeguarding of the journal's content for the long term, and the journal making its articles freely available online so there is no cost to purchase or read them—were rated as important by less than a third of respondents overall, with slightly larger shares of medical/veterinary academics citing free accessibility online and accessibility in developing nations as very important.

## The publication process

In recent years, alternative ways of circulating information have proliferated, including academics' 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.<sup>36</sup> However, fewer than 1 in 5 respondents across disciplines strongly agreed that their ability to share work directly with peers has made academic publishers less important, and more than 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 41). Of these, managing the peer-review process to provide high-quality feedback was rated important among the highest share of respondents, which suggests that academics ultimately seek publishers' facilitation of a process that helps them improve their research outputs. Other roles were also widely cited as important, with the smallest share—slightly over half—citing professional copy-editing as very important.

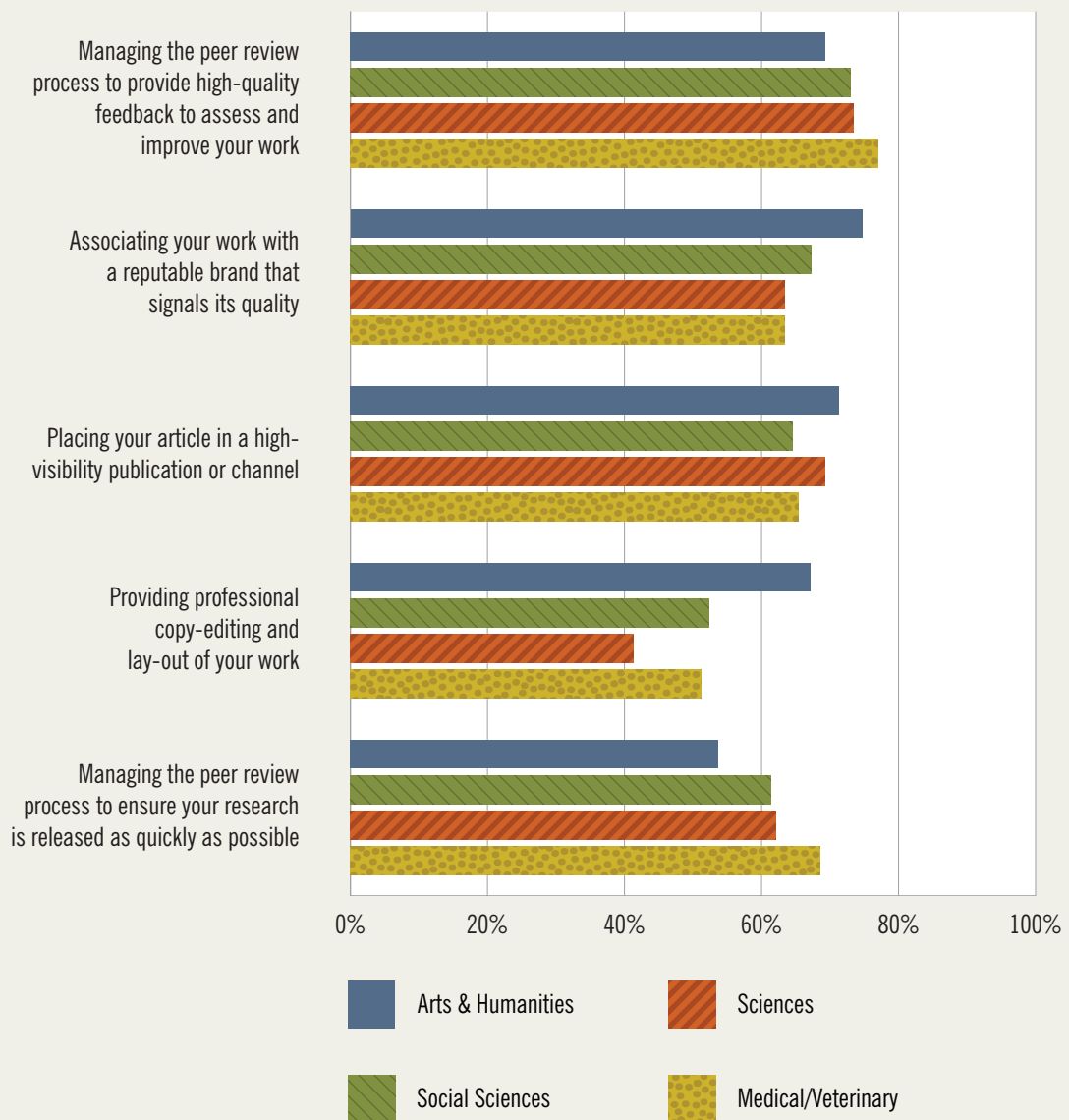
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36 Rupert Gatti, "Open Access: 'We no longer need expensive publishing networks,'" The Guardian's Higher Education Network Blog, <http://www.guardian.co.uk/higher-education-network/blog/2012/nov/08/open-access-academic-publishing-models>.



FIGURE 41

“Thinking back to the last research 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.



In addition to the model of communicating research through traditional publications, some academics have made their research directly available to peers in a variety of ways, including by circulating pre-print copies of academic articles online. Overall, a third of academics strongly agreed that circulating pre-print versions of their research was an important way for them to communicate their research findings with their peers. About 2 in 5 respondents indicated that it is important to them that their work appear—in final or pre-print version—in a repository provided by their college or university, its library, or their university system, in addition to a traditional publication venue, with a slightly higher share

of respondents at non-RLUK institutions indicating that this is very important to them. A slightly smaller share indicated that it is important that their work appear on their personal website or blog or in a cross-institutional repository focused on their discipline or field of study.

## Dissemination support services

In addition to learning more about the roles played by publishers, we were interested to see how academics' research dissemination activities can be better supported. In the Survey of Academics, 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, learned society, university press, or another service provider.

Respondents indicated that the services we asked about are not yet widespread (see Figure 42). 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 activities, including services to help them understand and negotiate favourable publication contracts, to help them determine where to publish to maximize impact, to help them assess the impact of work following publication, and to assist them with making a version of research outputs freely available online.

In addition to asking whether or not they receive these services, we asked respondents to rate how "valuable" each of these services would be to them, setting aside whether or not they already have access to them (see Figure 43). Although almost half rated the management of a public webpage as very valuable, smaller shares rated other roles as valuable; about 2 in 5 indicated they value support for making versions of their research outputs freely available online, and fewer ranked other roles as valuable.

An area closely related to publishing that has been of particular interest to many in the academic community in recent years has been the preservation and sharing of research data, both to enable future work to build on this and to provide a tool 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 academics who are being asked for the first time 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 collection of "scientific, qualitative, quantitative, or primary source research data." But while academics 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 44). Three-quarters indicated that they "preserve these materials [themselves], using commercially or freely available software or services," and just over a quarter of respondents reported that they turn to "a repository made available by [their] institution or another type of online repository." Smaller shares indicated that someone else—their campus library or a publisher—preserves these

FIGURE 42

“Does your college or university library, learned society, university press, or another service provider assist you with any of the following aspects of the publication process?” Percent of respondents indicating that they receive help with each of the following aspects of the publication process.

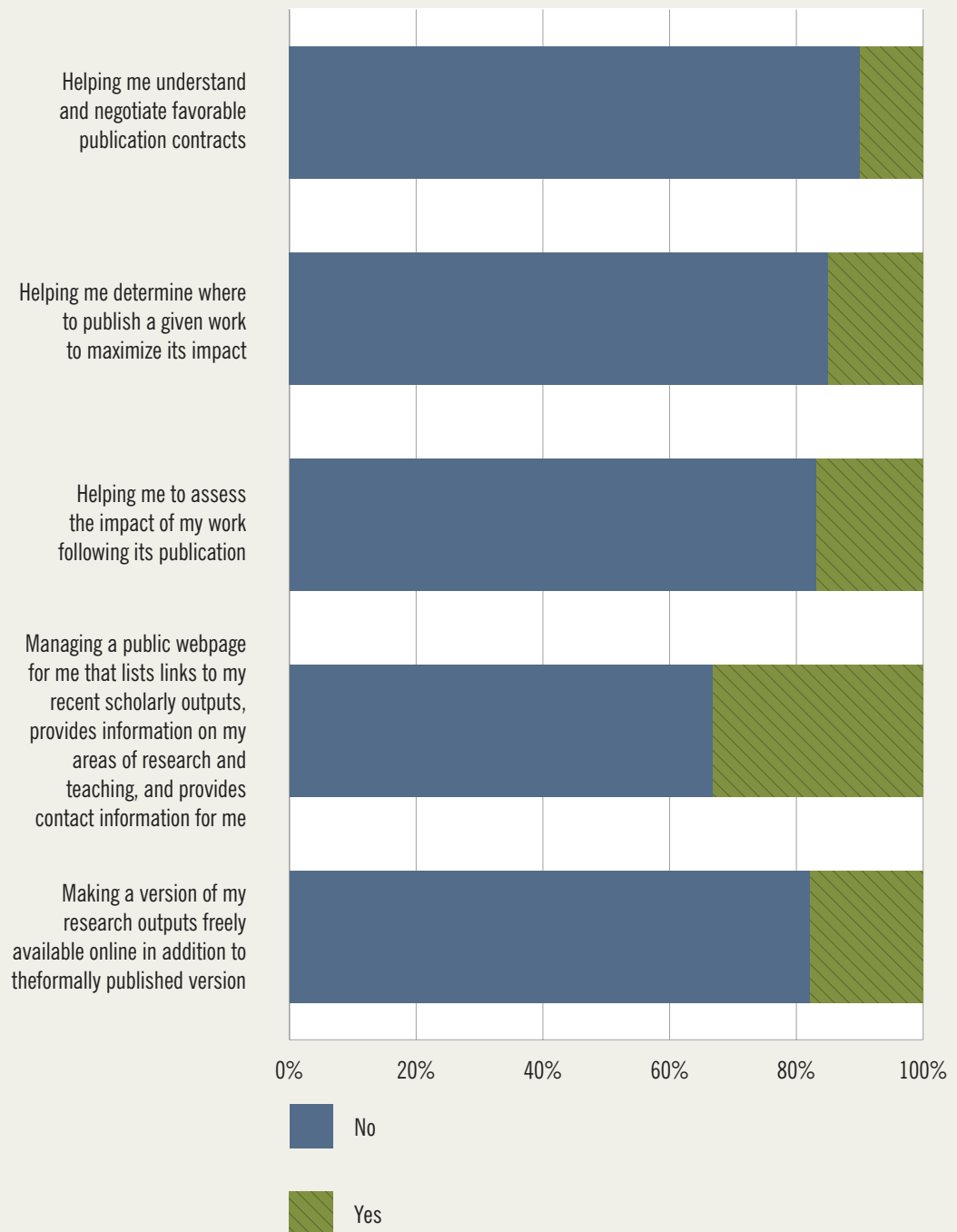


FIGURE 43

“How valuable do you find support from your college or university library, learned 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.

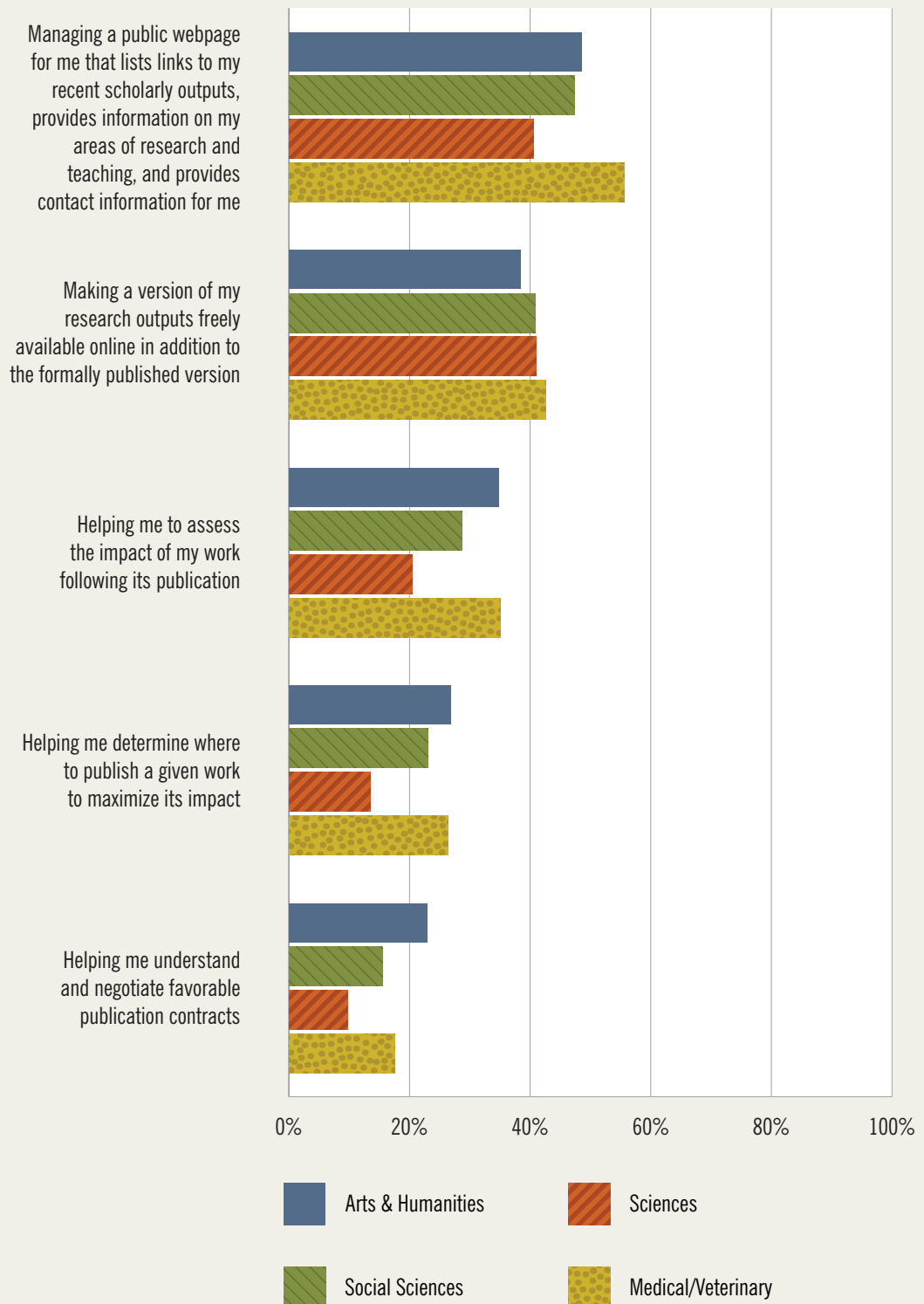
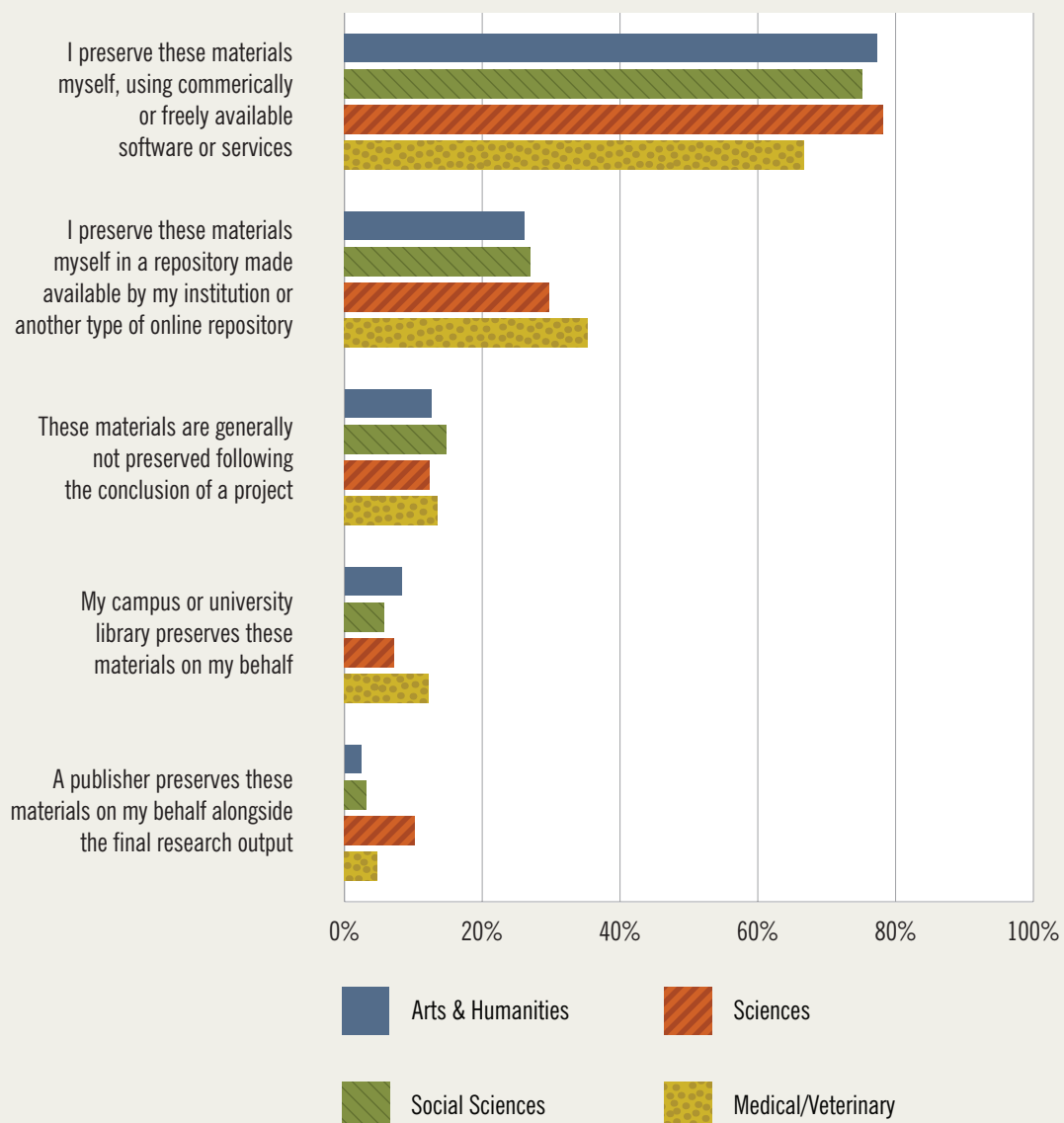


FIGURE 44

“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.



materials for them. If long-term data preservation is to become an important priority for the academic community, as encouraged by the Research Councils UK<sup>37</sup> and Jisc,<sup>38</sup> new solutions—or greater uptake of existing solutions—will be required to ensure that materials are preserved responsibly.<sup>39</sup>

## The role of the library

As the ways in which academics perform research and gain access to needed information and resources evolve rapidly, many questions have been raised about the value of the traditional library. Academic libraries in the UK have sought to identify the sources of value that they offer today,<sup>40</sup> and to understand the skills that librarians will need to develop in order to effectively satisfy the evolving needs of researchers.<sup>41</sup> The Survey of Academics complements these exercises by asking academics on a national level about the roles that they view their library playing and the value that it provides.

For each of a list of six roles, we asked respondents “how important is it to you that your college or university library provides each of the functions below or serves in the capacity below?” (see Figure 45 and Figure 46). 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, and we do not address the library’s potential contributions to open access publishing—but we believe that these roles encompass many of the broad categories of roles played by the library. The list below 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”
- Undergraduate support: “The library helps undergraduates develop research, critical analysis, and information literacy skills”

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37 RCUK Common Principles on Data Policy, <http://www.rcuk.ac.uk/research/Pages/DataPolicy.aspx>.

38 The Jisc programme on “Managing Research Data,” is helping to develop tools and practices to help academics manage data, <http://www.jisc.ac.uk/whatwedo/programmes/mrd.aspx>.

39 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.

40 “The value of libraries for research and researchers.” Research Libraries UK and Research Information Network, March 2011.

41 Mary Auckland, “Re-skilling for Research.” Research Libraries UK, January 2012.

FIGURE 45

“How important is it to you that your college or university library be the provider of each of the functions below or be the provider of the capacity listed below?” Percent of respondents indicating that each of the following functions or capacities are very important.

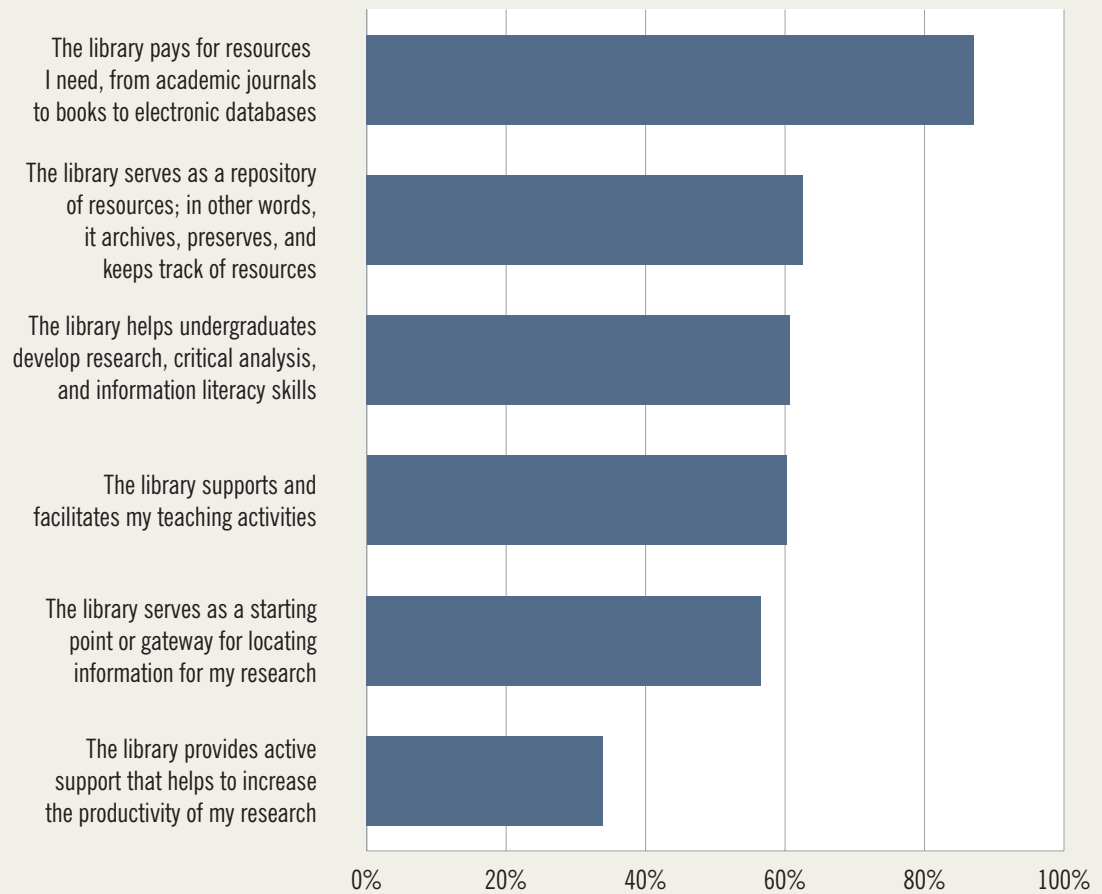
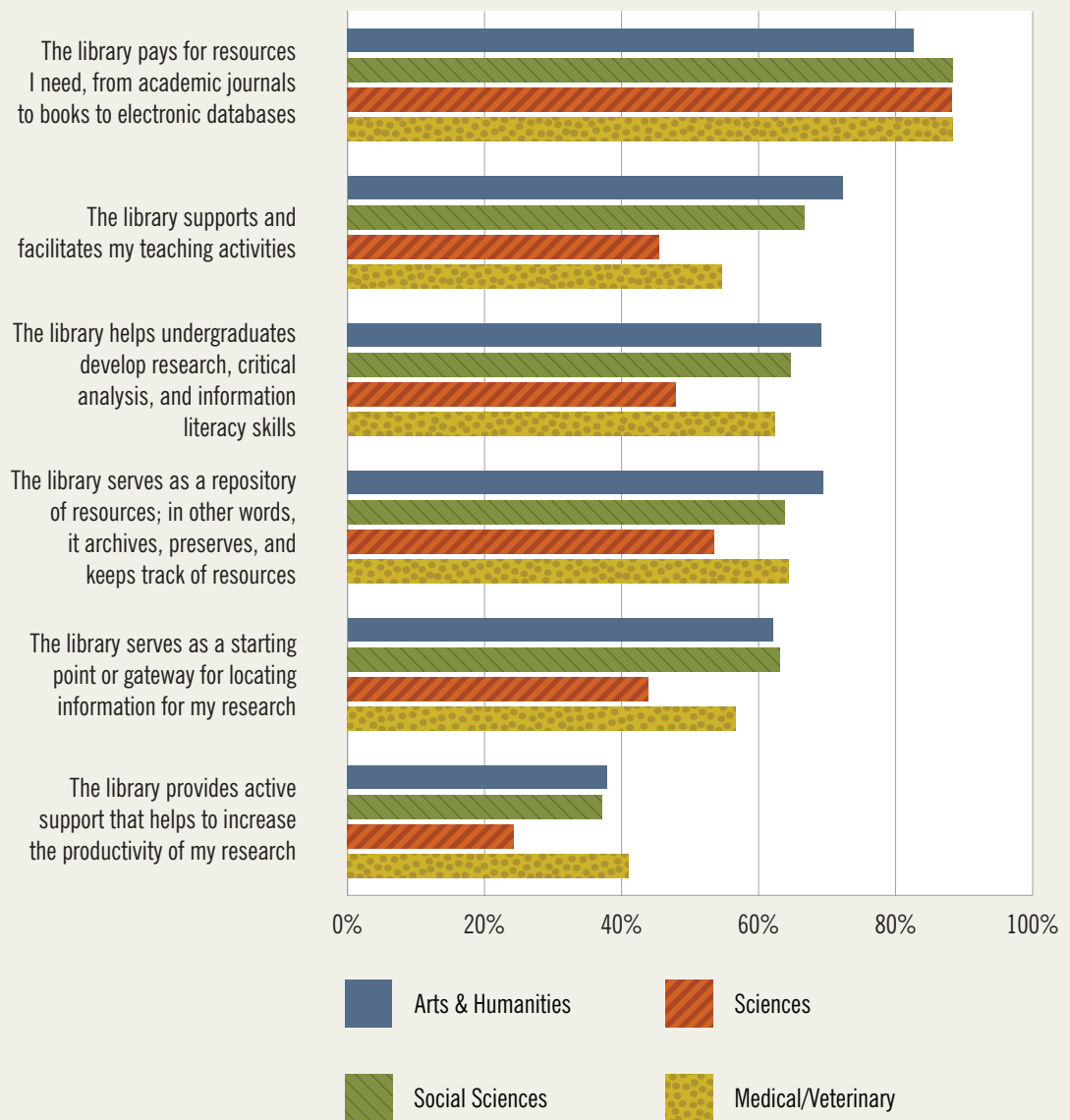


FIGURE 46

“How important is it to you that your college or university library be the provider of each of the functions below or be the provider of the capacity listed below?” Percent of respondents indicating that each of the following functions or capacities is very important, by disciplinary grouping.



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. The last three roles—teaching, research, and undergraduate support—are all more service-oriented roles; they chart the perceived importance of the library providing services in support of various academic activities or campus priorities.



In all disciplinary groupings, the role that was rated as very important by the largest share of respondents was that “the library pays for resources I need, from academic journals to books to electronic databases.” Almost 90% of respondents indicated that this “buyer” role is very important. In all disciplinary groupings except for the arts and humanities, there was a twenty percentage point or larger gap between this and any other response. In the arts and humanities, this gap was slightly smaller, reflecting both the slightly lower share of respondents who rated this as a very important role (closer to 80% than to 90%) and the fact that several other roles were rated as very important by large shares of humanists.

Several other roles were rated as very important by roughly 60% of respondents. Each of the library’s gateway, archive, teaching support, and undergraduate support roles were rated as very important by about 60% of respondents overall. Some minor disciplinary differences can be seen. For example, the share of humanists who rated each of these roles as very important was generally higher than the share of academics in other fields, and the share of scientists who rated each role as very important was generally lower than the share of academics in other disciplinary groupings.

In each disciplinary grouping, the library’s research support role was rated as very important by the smallest share of respondents—about a third of respondents overall. The share of scientists who rated this role as very important was particularly small—about 25%. This reflects an overall pattern: on each role except the buyer role, the share of scientists who rated a given role as very important was smaller than the share of respondents in any other disciplinary grouping who rated that role as very important.

These roles were also rated differently between institution types. Although the share of respondents indicating that the library’s buyer role is very important was slightly higher at RLUK institutions than non-RLUK institutions, and the archive role was roughly equal between institution types, all other roles were rated as very important at non-RLUK institutions (see Figure 47).

In an effort to understand the vision that academics 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 academic 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” (see Figure 48). About half of respondents strongly agreed with each statement, with slightly more respondents indicating that their library’s primary responsibility should be facilitating access. Although slightly more respondents in each field indicated that their library’s primary responsibility should be facilitating access than indicated that it should be supporting undergraduates, the gap was especially large among scientists, of whom almost two-thirds indicated their belief that the library should primarily support access. Even among scientists, though, there are notable differences between respondents at RLUK and

FIGURE 47

“How important is it to you that your college or university library be the provider of each of the functions below or be the provider of the capacity listed below?” Percent of respondents indicating that each of the following functions or capacities are very important, by institution type.

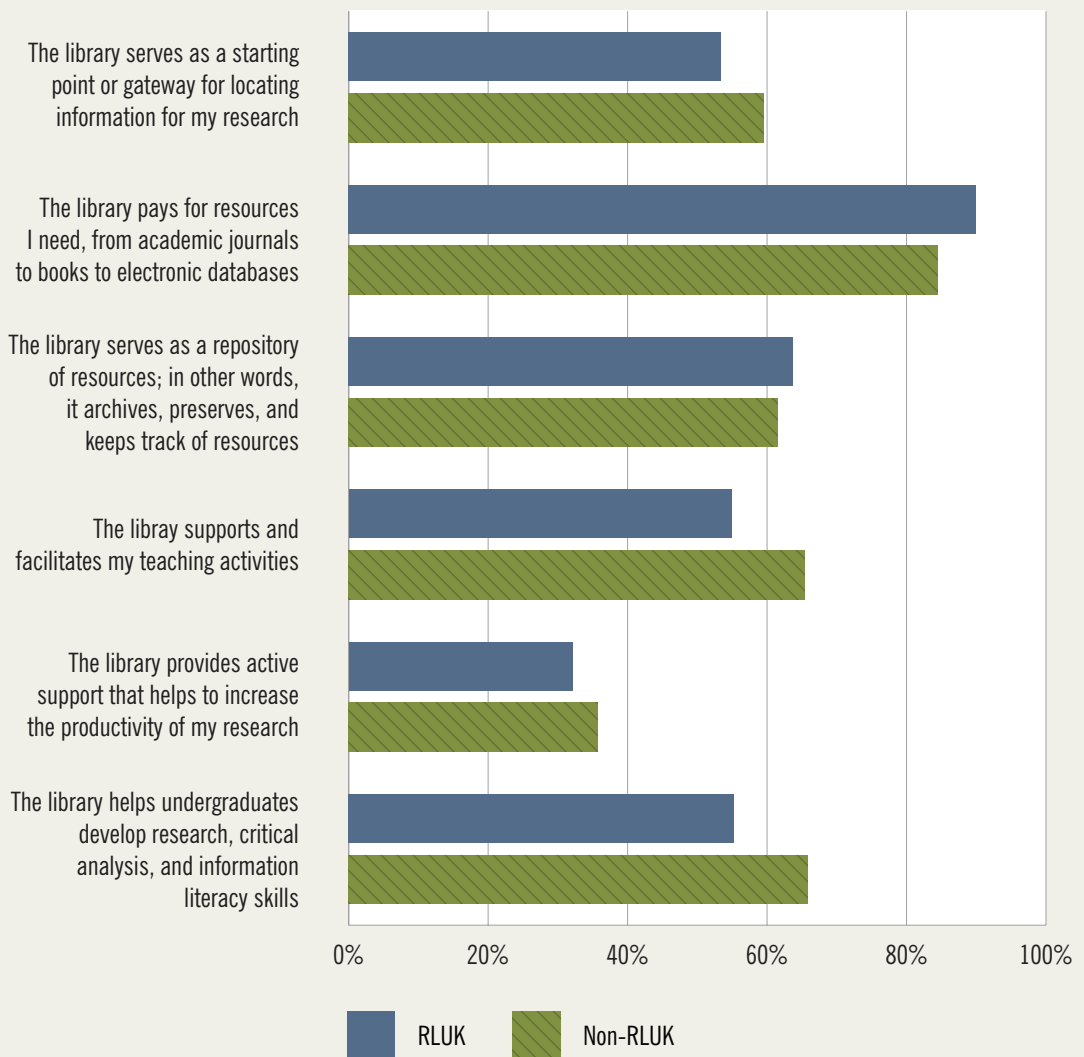
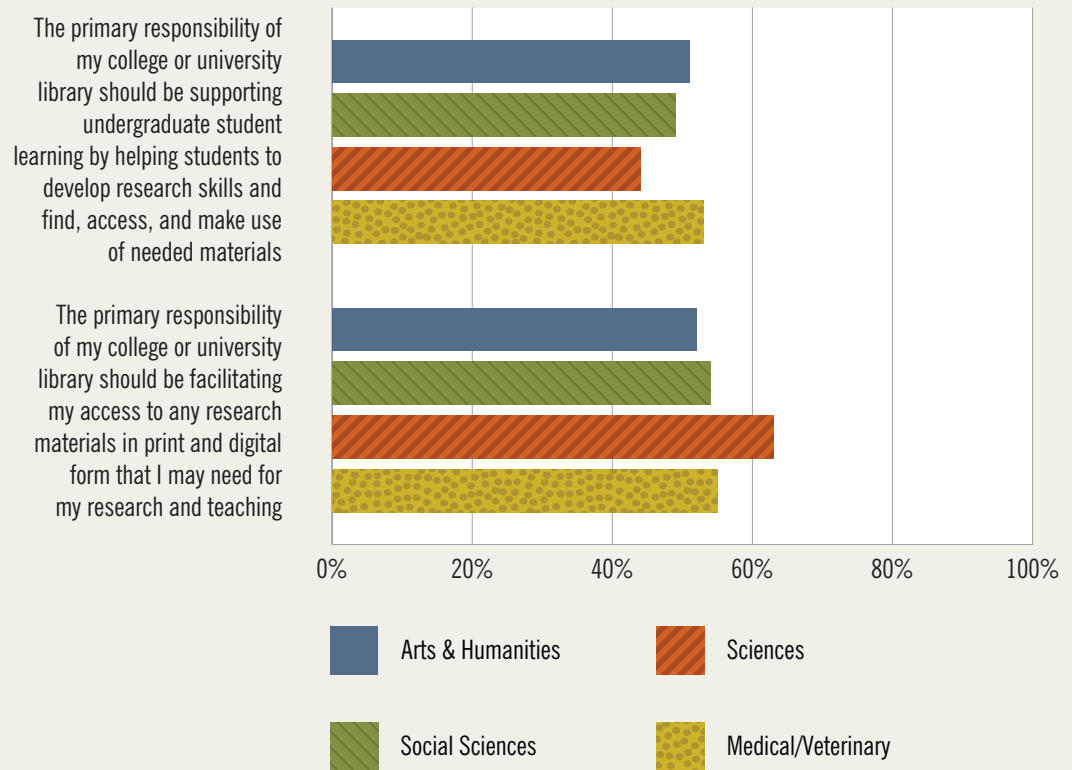


FIGURE 48

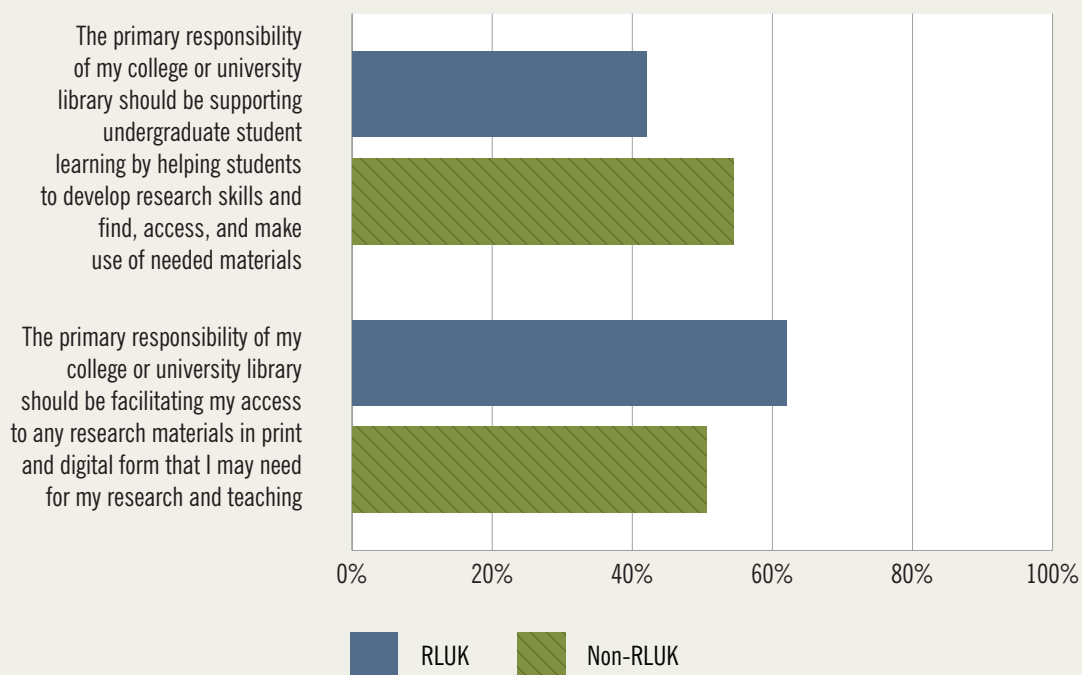
Percent of respondents agreeing strongly with each question of the questions listed below, by disciplinary grouping.



non-RLUK institutions, with larger shares of academics rating the library’s role in facilitating access as very important and smaller shares rating the library’s student support role at RLUK institutions than at non-RLUK institutions, a distinction present even among scientists (see Figure 49).

FIGURE 49

Percent of respondents agreeing strongly with each question of the questions listed below, by institution type

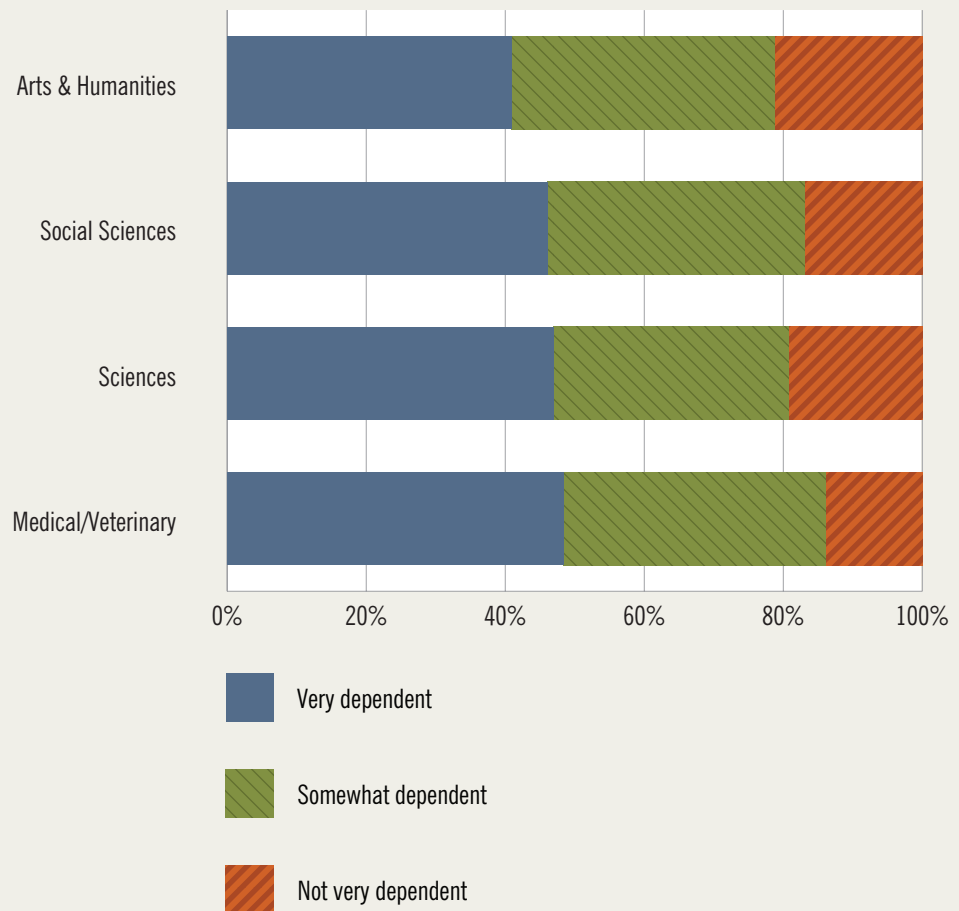


Overall, about 45% of respondents indicated that they would describe themselves as very dependent on their college or university library for the research they conduct (see Figure 50). Given the relatively greater shares of humanists who rated each of the library’s roles as very important, it is somewhat counterintuitive that the share of humanists who described themselves as very dependent on the library was smaller than the share of academics in other disciplinary groupings who did so, and that the share of humanists who described themselves as not very dependent on the library was slightly larger than the share of respondents in other disciplinary groupings who did so. Slightly larger shares of social scientists, scientists, and medical/veterinary academics indicated that they are very dependent on the library, and slightly smaller shares of academics at non-RLUK institutions indicated that they are very dependent on the library.

When asked for their reactions to strongly worded statements about the changing value of the library, relatively small shares of respondents strongly agreed with the statements “because faculty have easy access to academic content online, the role librarians play at this institution is becoming much less

FIGURE 50

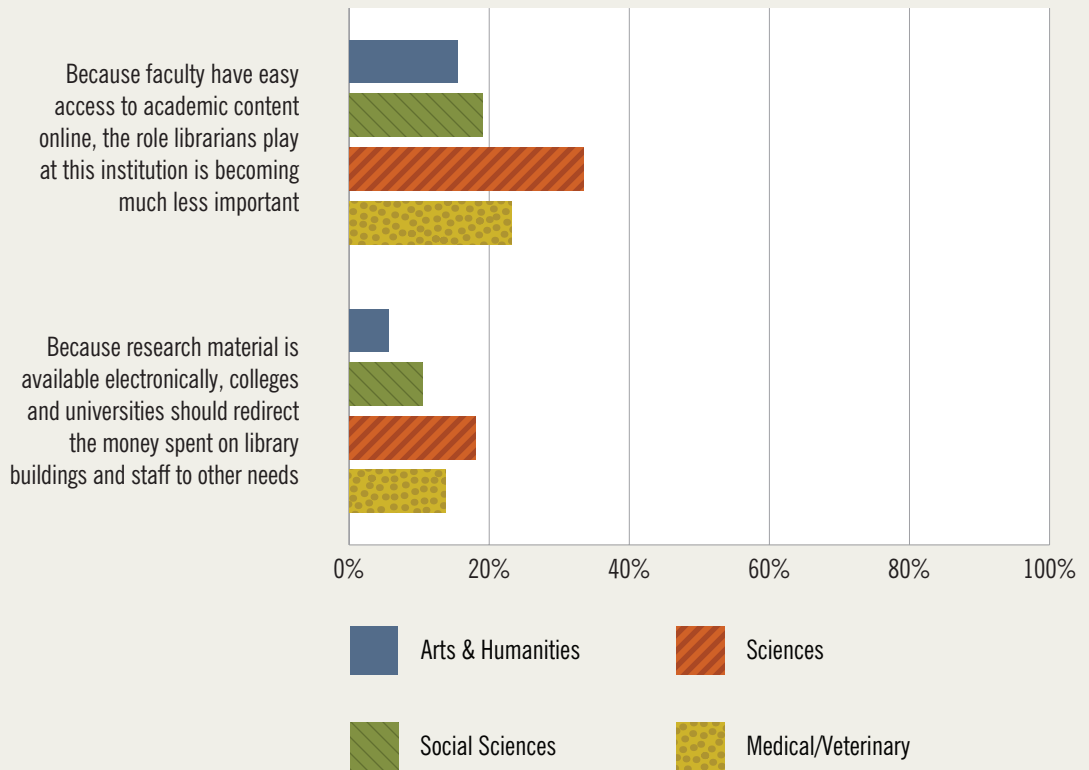
“How dependent would you say you are on your college or university library for research you conduct?” Percent of respondents indicating they are “very,” “somewhat,” or “not very” dependent on their college or university library, by disciplinary grouping.



important” and “because research material is available electronically, colleges and universities should redirect the money spent on library buildings and staff to other needs” (see Figure S1). About a quarter of respondents strongly agreed with the former statement about the declining importance of the librarians, and a substantially greater share of scientists—about a third—agreed strongly with this statement than academics in other disciplinary groupings. Far fewer respondents (about 12% overall) agreed that money should be redirected away from library buildings and staff, although again a relatively larger share of scientists—nearly one in five—strongly agreed with this statement.

FIGURE 51

Percent of respondents agreeing strongly with each question of the questions listed below, by disciplinary grouping.



## The role of the learned society

In addition to recorded publications, academics also communicate with each other in a variety of other formal and informal ways. Although the learned society is a traditional hub for academics to communicate with each other through conferences and other media, the changing environment for scholarly communications—in particular, the shift towards open access encouraged by the Finch report<sup>42</sup>—may pose challenges for these organizations in the future, as their most valued roles as conveners of conferences and publishers of peer-reviewed journals are disrupted.

Nearly three-quarters of respondents said they are a member of the primary learned society in their field, and slightly less than half are members of additional learned societies—either a society focusing on their particular area of research interest or organized for the geographical region in which they live and work. Only 2 out of 10 respondents said they did not belong to any learned society at all. About 3 out of 5 indicated that the primary society for their discipline or field was the most important to them, and virtually all of the remaining respondents indicated that a society focusing on their particular area of research interest was the most important.

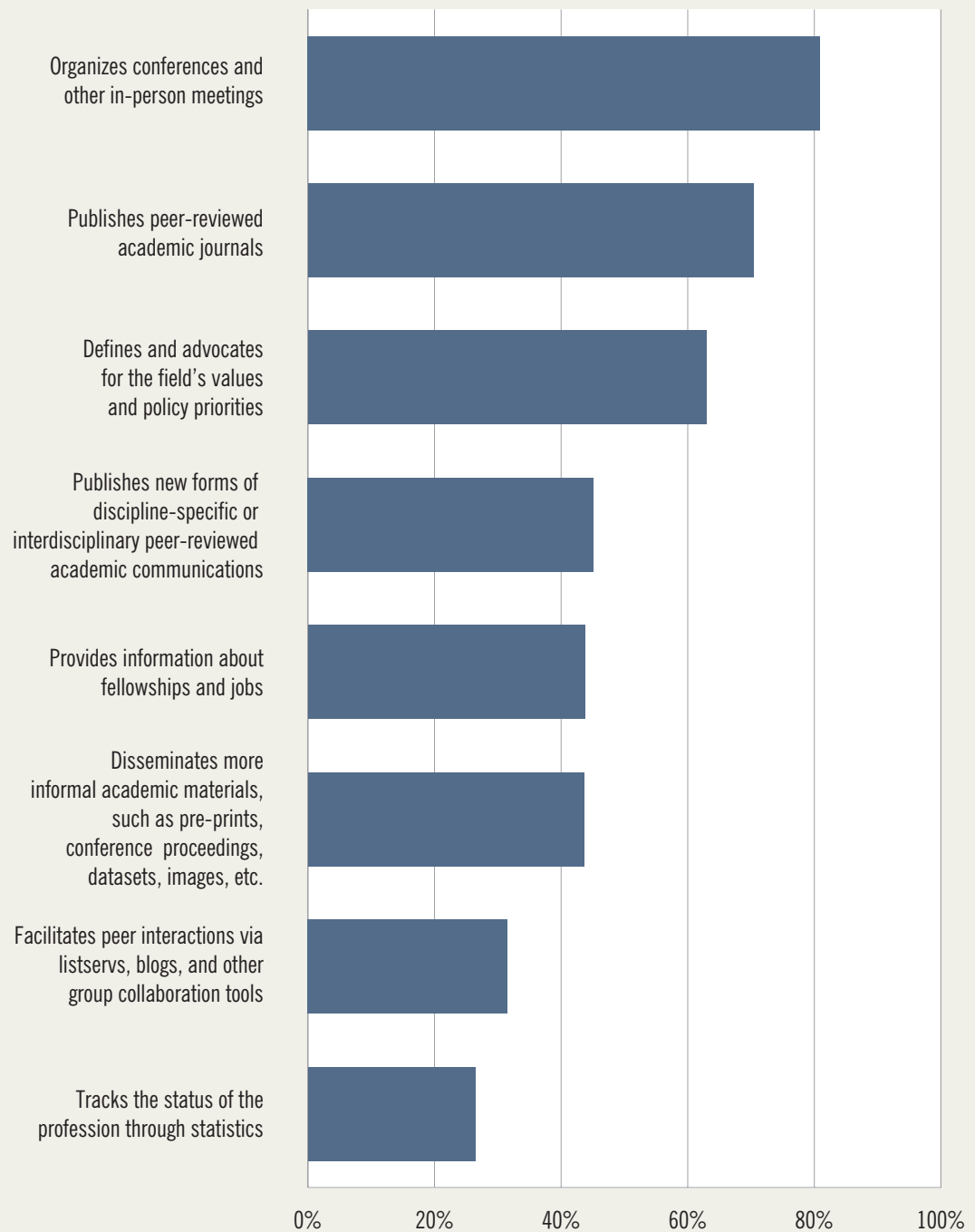
When asked about the importance of the various roles that the primary society in their field plays, 8 out of 10 respondents indicated that organizing conferences is a very important role, 7 out of 10 indicated that publishing peer-reviewed academic journals is a very important role, and 6 out of 10 indicated that their society's role in defining and advocating for the field's values and policy priorities is very important (see Figure 52). Other roles were less widely cited as important. About two 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 academic communications, and disseminating informal academic materials to be very important. Two additional roles—tracking the status of the field through statistics, and facilitating online peer interactions—received a slightly smaller share of responses.

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42 Alice Meadows, "Open Access—What's a Learned Society To Do?" The Scholarly Kitchen, July 12, 2012, <http://scholarlykitchen.sspnet.org/2012/07/12/open-access-whats-a-learned-society-to-do/>

FIGURE 52

“How important is it to you that the primary learned 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 or capacities is very important.



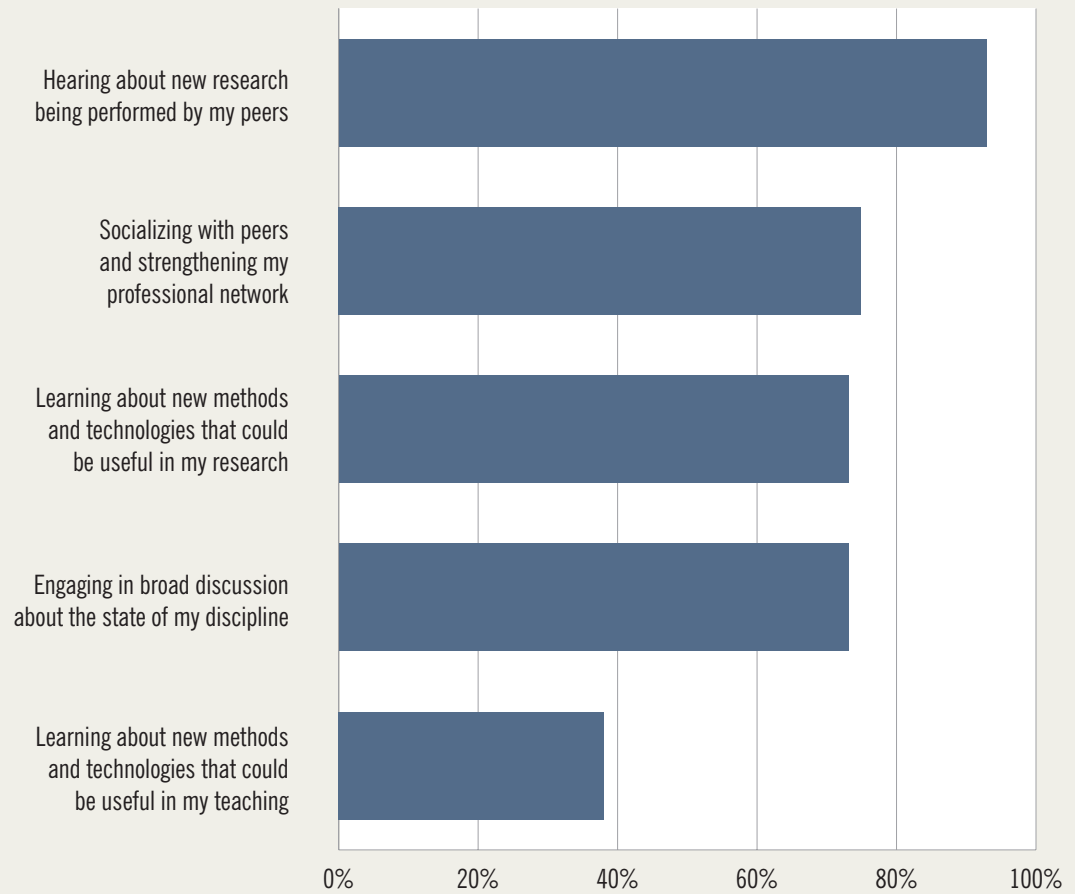


While conferences were widely cited by academics as an essential role of their learned societies, the academic conference consists of a variety of different activities, of varying levels of importance (see Figure 53). Virtually all respondents agreed that hearing about new research is a very important conference activity for them, but over 70% also agreed that other activities—socializing with peers, learning about new methods and technologies for research, and engaging in broad discussion about the state of their discipline—are very important. However, only about 2 in 5 respondents agreed that learning about new methods and technologies for teaching is a very important conference activity for them.

About a quarter of respondents strongly agreed with the statement that they “do not feel the need to engage more with [their] peers at academic conferences,” while around 4 out of 10 strongly disagreed. Both funds and time seem to be equally constraining; roughly half of respondents indicated that they did not have the funds to attend more conferences, and the same share indicated that they lacked the time to attend.

FIGURE 53

“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 Survey of Academics 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:

- Discovery starting points differ noticeably by disciplinary grouping; for example, medical and veterinary respondents are more likely to start with electronic research resources and less likely to utilize websearch compared with others. While peers are not significant discovery source for several types of research, they are very important for maintaining current awareness of the scholarly literature.
- Decisive shares of scientist and medical and veterinary respondents are comfortable with the transition to electronic-only publishing and collecting for journal current issues, and majorities are comfortable with the deaccessioning of journal backfiles. Six out of 10 respondents overall reports having used a scholarly monograph in digital form in the past six months, but while significant shares like e-books for exploratory uses a majority prefers print for in-depth reading.
- Freely available materials are seen to be having a real impact on access. Academic libraries collections are most likely to be seen as an important source for providing journal articles and books for research and teaching purposes, but following closely in second place are freely available materials online. When an item is not held in the library collection, the highest share of respondents report that they look for a freely available version online, while the second highest share gives up, both of which outrank using the library's interlending or document supply service. Disciplinary groupings differ noticeably in several cases in their access practices. Overall, a third of respondents report that they can almost always get satisfactory access to needed journal articles not immediately available through their institution.
- In selecting areas of research to pursue, nearly all of our respondents indicated that they are guided primarily by their own personal interests, though many also consider the availability of funding or opportunities to publish.
- Virtually all respondents indicated that it is very important to them that their research reaches academics in their own subdiscipline or field of research, about 4 out of 5 identified academics in their broader discipline as an important audience, and over half ranked "professionals in my field outside academia" as a very important audience. Beyond these core audiences, a relatively small share of respondents identified the general public as a key audience, and scientists were especially unlikely to do so.
- Academics' audience prioritization is clearly reflected in choices in they make regarding the publication of their work, where traditional measures of influence are most important in selecting where to publish their articles.

- Overall, about 45% of respondents indicated that they would describe themselves as very dependent on their college or university library for the research they conduct. Almost all respondents rate the library's role as a purchaser of needed resources as very important, while other roles are less universally indicated as important.
- Learned societies are valued primarily for organizing conferences, publishing peer-reviewed academic journals, and defining and advocating for the field's values and policy priorities. Conferences are valued for their formal function of helping academics keep up with new scholarship, and the informal role of connecting academics with peers.