

Navigating Research



How academic users
understand, discover,
and utilize reference
resources

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Executive Summary

This study explores users' and librarians' perspectives on the role of reference resources in research and teaching in today's academic institutions. It examines how users seek contextual information and guidance for areas of scholarship as they conduct research, and how reference resources can support their work.

THE 3 STRANDS OF THE RESEARCH INCLUDED

- A review of existing literature.
- In-depth qualitative interviews with 16 librarians and 18 end-users (academic faculty and students).
- A survey of 164 librarians.

Key Findings

- Although recognition of 'reference' as a distinct category of resources is declining, the underlying need for contextual information remains significant and, in some areas, new needs are emerging.
- Users' research needs are moving away from basic factual information and terminology, for which users generally turn to free online sources.
- Given the quantity of information and content available to users, resources offering guidance to a field of study and its scholarship retain appeal to users, as a bridge between introductory materials and increasingly specialized research publications, and to support work in interdisciplinary fields.
- As users are decreasingly likely to identify 'reference' resources as a distinct category, their utilization relies on their visibility and discoverability. Since ways in which users discover and access content are subject to ongoing change, this is likely to remain a constant challenge facing publishers, librarians, and researchers alike.

ONE USER'S PERSPECTIVE:

"...If you're doing some research on something a little more obscure it would be useful to have a resource where you could find further references and books and get an overview of the topic—something to point you to that foundational conversation around a topic. As a student, someone in the process of gaining expertise in a field, I need to know what is foundational and essential on a topic." —MA STUDENT [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

1

Introduction

This study explores how today's scholarly users undertake research, examining situations in which users seek guidance and support, and where they turn for these. It progresses through stages of the research process, from general orientation within a subject to focused, in-depth exploration of a specific topic. It analyzes the challenges and needs that arise at each stage of this process and assesses how users choose among resources offering information or support as well as the qualities that inform their decisions. It combines a consideration of users' perspectives and behaviours with librarians' assessments of users' needs and of the resources that can meet those needs. Evaluating the impact of changes in the information environment and in academic research and teaching in recent years, it examines how reference resources can meet the needs of today's users.

2

Research Methodology

2.1 REVIEW OF EXISTING STUDIES

The study began with a review of literature relevant to this topic to establish the existing state of knowledge on the subject and to inform the scope of the research. Source material included: industry white papers, trade publications, library and information science research, professional society reports, and internal OUP research. The dates of these studies ranged from 2009 to 2017.

2.2 IN-DEPTH INTERVIEWS

The individual in-depth interviews focused on the themes emerging from the review of existing literature. They concentrated on issues that were not addressed in earlier studies and on areas in which those studies raised questions that merited further exploration. Each interview was conducted by telephone, lasted about one hour, and followed a semi-structured interview script. They were conducted between February and April 2017.

The provision and usage of reference resources differ significantly between different types of libraries and regions of the world. In order to gather an indicative understanding of the state of reference in the academic context, this initial study adopts a relatively narrow scope, focusing on a small sample of academic libraries in the United Kingdom and North America. Although our sample is not statistically representative, it includes a range of institution types within these two regions to form an indicative selection, supporting our exploratory approach.

BREAKDOWN OF THE IN-DEPTH INTERVIEW SAMPLE

	UK	North America	TOTAL
Librarians	6	10	16
End-users	Academic Faculty	5	18
	Master's/PhD/Post-doc Level	5	
	Undergraduate	2	
TOTAL	12	22	34

Institution groupings for North America were based on institution size and classifications of research activity given in the 2015 *Carnegie Classification of Institutions of Higher Education*.¹

- Group A included Doctoral Universities with classification of ‘Highest Research Activity’ and postgraduate Research Institutes.
- Group B included Doctoral Universities with classification of ‘Moderate Research Activity’ and Master’s Universities with Larger Programmes.
- Group C included Baccalaureate (‘Liberal Arts’) Colleges.

UK institutions were categorized according to institutions’ reported research income.²

- Group 1, ‘Higher Research Income’, included institutions with research income in 2014/15 totalling more than £100m.
- Group 2, ‘Medium Research Income’, included institutions with research income in 2014/15 totalling between £25m and £100m.
- Group 3, ‘Lower Research Income’, included institutions with research income in 2014/15 totalling less than £25m.

BREAKDOWN OF THE INSTITUTIONS REPRESENTED BY THE INTERVIEWEES

	Librarians	End-users
Group A/1	6	7
Group B/2	5	7
Group C/3	5	4

2.3 LIBRARIAN SURVEY

Based on the emerging findings from the in-depth interviews, we surveyed librarians who work in academic institutions in the UK and North America, with the aim of validating and further exploring these trends.

We invited librarians to complete an online survey (in late April 2017) via emails, mailing lists, and Twitter. Overall, we received 164 usable responses from librarians who matched our criteria. Of these, 10% came from UK institutions and 90% from North America.

We asked librarians to describe their role (as an open-text response). These responses were systematically coded into a number of categories. One description could include up to six categories. The key areas that emerged from the descriptions give an indication of the overall librarian sample.

CATEGORIES	FREQ	%
Reference service	61	42.7
Subject librarian / Liaison to faculty	57	39.9
Instruction / Information literacy	53	37.1
Collection development / Selection	51	35.7
Director / Management	25	17.5
Acquisitions / Procurement / Assessment	17	11.9
Public services / Access services	12	8.4
UX / Library technology/ website	8	5.6

N = 143

3

Review of Existing Studies

Previous research has noted that the proliferation of online information sources has radically changed both the context in which scholarly reference resources sit and the ways in which they are used. The distinction separating ‘reference’ resources from other sources of information has become blurred, and their categorization as a distinct type of resource has become less meaningful to users.³ As factual information on many subjects has become widely and easily accessible, the focus of reference publishing has shifted. As a 2014 discussion of the state of reference publishing suggested, ‘where reference publishers once traded on collections of facts, the “contextualization” of facts is now a core mission.’⁴

Analyses of research behaviour support the suggestion that contextualization addresses a significant need for today’s users. A study carried out by the Project Information Literacy group at the University of Washington examined the research practices of undergraduate students within an ‘information landscape [that] has shifted from one of scarcity of resources to abundance and overload.’⁵ It found that ‘students consistently referred to “finding context,” in one form or another, as the most laborious, yet requisite, part of the research process’. It proposed a typology of such contexts, including two categories of particular relevance to reference resources:

- **‘Language context** involves becoming more comfortable with the language, terms, and discourse of a topic area.’ This was especially important ‘when it came to formulating search terms.’
- **‘Big picture context** involves selecting and defining a topic’ and formulating a research question. It involves understanding how a particular topic fits into the broader context of a wider field of scholarship and discerning the relevant scholarly perspectives relating to it.⁶

The resources favoured by users in seeking such context, and the role of reference resources in meeting this need, is one focal point for this study.

While the adoption of Web-scale discovery layers in academic libraries has become increasingly widespread in recent years, assessment of their impact on users’ search behaviour is still ongoing.⁷ A 2015 study assessed the effectiveness of a discovery system for students searching for research materials.⁸ One problem it identified is students’ lack of understanding of how to formulate searches and how to use facets and limits to refine the results set. Another factor affecting the success of searches is whether or not students begin with a sufficiently defined research topic, an understanding of the background context, and knowledge of the relevant terminology. The authors described one user complaining of the excessively narrow focus of the studies in the search results; they suggested that she ‘was probably seeking a general, encyclopedia-style entry on her topic, and she did not understand why more specialized topics were appearing in her search results’. Observing another student who seemed to have only a vaguely defined topic, the authors remarked that ‘it seemed like she really needed general information, and her switch to a Google search later in the recording was a good decision’.⁹ This suggests that in order to gain the full benefit of powerful Web-scale search tools, users may require guidance and contextual information.

The present study builds upon this earlier research to consider how reference resources can support users in establishing the terminology, factual background, and contextual understanding that facilitate the successful exploration of specialized scholarship. Integrating librarian and user perspectives, it focuses on how reference supports research and teaching in academic contexts today, how it relates to other information sources, and how it can meet the emerging needs of users in the context of rapid technological and institutional change.

4

Research Findings

The research findings are presented in relation to stages of the research process. This begins with initial orientation within a subject, at which point users seek to establish basic factual information and relevant terminology, which inform searches for relevant information. The second stage involves framing a specific research topic and situating it within a broader subject. The final stage involves in-depth exploration of this topic, the relevant existing scholarship that relates to it, and the key themes of debate within that scholarship. Whilst less experienced researchers are more likely to lack broader contextual knowledge within their subject and are therefore more likely to require guidance in the earlier stages of research, these steps are applicable to research at all levels. The discussion considers the perspectives of different users at each stage and integrates these with librarians' assessments of users' needs and of relevant resources.

4.1 INITIAL ORIENTATION: FACTUAL INFORMATION AND TERMINOLOGY

Of the 18 end-users interviewed, 11 reported that their most frequent first step in researching a new topic would be immediately to begin searching for scholarly publications. The remainder would seek quickly to acquire the necessary factual background and terminology to conduct such a search (5 by performing a Web search; 1 by consulting a textbook; and 1 by turning first to a reference work). The main obstacle that users might face in conducting such searches is in lacking 'language context', as described in Project Information Literacy research, or relevant terminology to formulate searches. Users described two reasons to begin searching for publications in the initial stages of research:

- 1 Users are keen to reach relevant specialist sources as quickly as possible.** All users conduct research within a limited timeframe and are seeking the most efficient ways to identify and assess specialist resources relevant to their topic. It appears that concerted efforts to obtain background information or relevant keywords are generally made only when users encounter problems either in identifying or in understanding specialist scholarship. Undergraduate students—those most likely to have very little existing contextual knowledge of the subject of their research—also worked on projects of the most limited scope within the most narrow timeframes, and so the need for speed and efficiency was most acute for them.
- 2 Users expect that all searches will generate useful information.** Even if such a general search was not immediately successful in obtaining relevant resources, a master's student suggested, it offered an efficient means by which 'to get a general sense of the conversation' relating to the topic and would indicate the keywords in wide use in that area of study. This information could be used to filter results or to adjust search terms in order to identify the most relevant resources for the topic in question:

'Frequently, what happens is that you start off with one search and read the results and realize you should use different keywords and then do another search with the new keywords and narrow down the results that way.'

—POSTDOCTORAL RESEARCHER [RESEARCH INSTITUTE, USA]

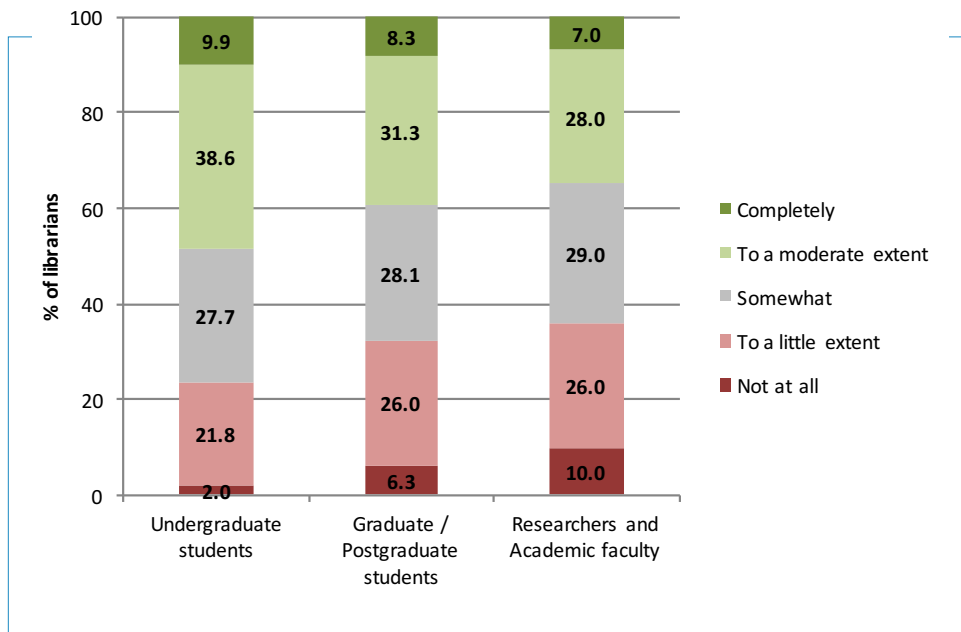
Users were divided in where they conducted these searches: even numbers reported that they would do so using the library’s discovery system (6); Google Scholar or Google Books (6); or a database such as PubMed or the *MLA International Bibliography* (6). This division would appear to support the suggestion made in a 2014 Ithaka S&R report on discovery that ‘*practices and needs vary tremendously*’ between different user groups, and that each user’s preferred starting point for searching reflects their own particular needs.¹⁰ Librarians’ views on the most appropriate resource for literature searches were also divided.¹¹ There was general agreement that discovery layers aided users in navigating the diverse mixture of resource types, including the very large quantity of digital content, offered by libraries today. In this context, as one librarian explained, ‘*the discovery layer is a very good starting point to find the new, novel, and interdisciplinary stuff*’.

Some librarians, however, expressed reservations about the suitability of discovery layers for more advanced researchers conducting systematic literature searches. As one explained:

‘Sometimes the user journey is not always what we would expect it to be; and that’s OK at undergraduate level because sometimes they just need something that fulfils their need. ... We’re now of the opinion that a one-size-fits-all system is not effective for everyone [and so] subject librarians are directing advanced users to subject pages ... offering something much more targeted to their research.’ —LIBRARIAN [HIGHER RESEARCH INCOME UNIVERSITY, UK]

The diversity of views regarding discovery layers was confirmed by survey findings, as illustrated in Figure 1.

FIGURE 1 EXTENT TO WHICH LIBRARIANS FEEL THAT THE LIBRARY’S DISCOVERY LAYER IDENTIFIES RESOURCES RELEVANT TO USERS’ RESEARCH NEEDS



Q: *If your library has a Web-scale discovery layer, to what extent do you feel it identifies reference resources relevant to users’ research needs? (N=101; 96; and 100, respectively.) Responses based only on those who have a Web-scale discovery layer.*

Librarians reported that users seeking assistance would generally have conducted a discovery layer search independently, and would ask for help only if they were unsuccessful in finding appropriate resources in this way. User enquiries at this stage of research, as described by librarians, can be divided into those who require general assistance in formulating searches and those who may require some general factual information to support their search. In the first case, librarians offered users assistance in identifying keywords to conduct a discovery system search and in narrowing and filtering results as required, or directed them to subject-specific resource guides to enable them to explore the available resources. In the second case, librarians agreed that students would most often conduct a general Web search for factual information.

Almost all users agreed that if they required factual information to proceed with their work, they would most likely turn to a Web search in the first instance. Efficiency, comprehensiveness, and familiarity are decisive in this respect. One student described the appeal of Wikipedia as follows:

'I just appreciate that there's one place where I can find information with a broad overview. ... It's a place for me to start to figure out what I should be searching for. It's also a familiar site which I know is going to have information on just about anything I could want.'

—UNDERGRADUATE STUDENT [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

A faculty member echoed the point that Web searches can provide a useful starting point:

'I make use of Google and Wikipedia, and I often use those as a sort of starting point to point me towards something that would be more substantial ... or something more reliable.'

—FACULTY MEMBER [HIGHER RESEARCH INCOME UNIVERSITY, UK]

Web searches might also offer a means of identifying keywords that could be used to formulate searches for scholarly materials, as a doctoral student explained:

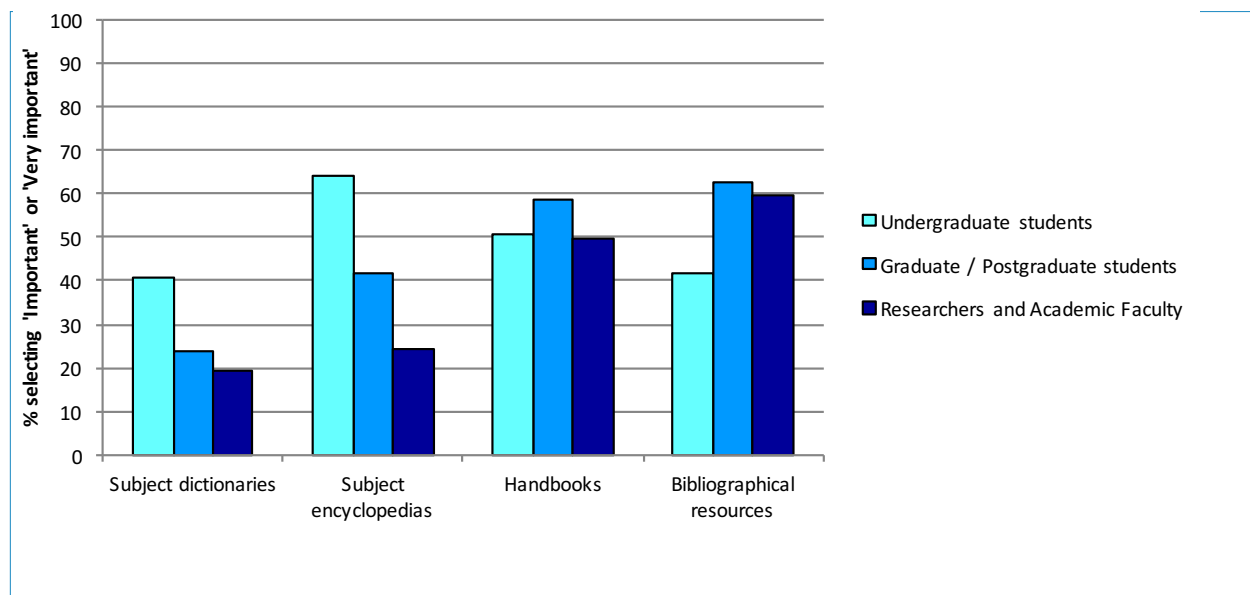
'Until I get to that point when I need those scholarly sources, Google is a really quick way to get some information to get into what I'm looking at—so then I can take some of the keywords that I've learned from the Google search and then I have something I can actually type into the library databases, because when you go to library databases you often need something fairly specific.'

—DOCTORAL STUDENT [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

All librarians agreed that useful factual information could be found from Web searches but drew a range of inferences from this. At one extreme is the view that reference works providing compilations of factual information and 'quick, brief biographical publications' are unlikely to be used since 'it is possible to get a lot of [such] information online', as one librarian suggested. Another librarian, however, noted that for introductory information on 'theories or particular figures that they [users] don't know', subject dictionar-

ies 'define these things in a very succinct way' and felt that they offered a valuable resource but were not always consulted by users. One compromise between these two positions focused on directing users to sources of factual information regarded as more authoritative, by way of library subject guides. These generally list a combination of subscribed and open Web resources, which, as a third librarian explained, 'are more vetted than just a Google search'.

FIGURE 2 LIBRARIANS' PERSPECTIVE ON THE IMPORTANCE OF REFERENCE RESOURCE TYPES FOR DIFFERENT USER GROUPS (CHART REPRESENTS THOSE SELECTING THE TOP 2 CATEGORIES ['VERY IMPORTANT' OR 'IMPORTANT'] ON A 5-POINT SCALE)



Q: How important do you feel these content types are in supporting the work of the following groups? Scaled response: Not important; Slightly important; Moderately important; Important; Very important. (N=143)

Survey responses from librarians show that subject dictionaries were less frequently considered important for users than the other types of reference resources. But they were more frequently considered important in supporting the work of undergraduate students than that of postgraduates or faculty.

User interviews suggested that researchers at all levels have concerns about the reliability of information they may find by conducting open Web searches. They also suggest, however, that the reliability of this information is not users' primary concern at this stage of research. The key qualities of Web searches are their ease and speed. Users generally felt that if such a search could efficiently help them to identify relevant scholarly sources, then those sources could be used to confirm factual details. Most users recognized that, in certain cases, specialized resources may be more helpful to them than what could be found on the Web. However, given the importance accorded to efficiency and convenience at this stage, users would be likely to turn to specialized resources only if they were confident that they would quickly provide useful information, or perhaps if Web sources proved unfruitful for their query.

4.2 DEFINING THE RESEARCH TOPIC

Librarians reported that users rather rarely sought assistance in finding general factual information or in identifying keywords with which to begin searching; they more often required support in formulating a specific research question. One librarian echoed the Project Information Literacy studies that indicate the need for ‘Big Picture Context’:

‘[Students] often are not able to very well articulate the actual question that they have, the actual project on which they want to work. So leading them to an encyclopedia or handbook gives them the opportunity not to be overwhelmed by material, but to get a sense of how they frame the question, what additional work they need to do on that, and gives them a good launching point.’ —LIBRARIAN [UNIVERSITY WITH ‘HIGHEST RESEARCH ACTIVITY’, USA]

Assistance in formulating a specific question and in translating a query into an ‘information need’ was central to the ‘reference interview’ as traditionally conceived, in which a reference librarian would discuss a user’s research question and assist them in searching for information sources.¹² In more recent years, the emphasis of library service has shifted towards ‘a consultative model of assistance ... enabling [users] to take ownership of their research skills’.¹³ In this context, both users and librarians valued resources that can offer useful guidance to aid users in delineating their research topic without necessarily requiring the direct involvement of a librarian. Interviewees described other specific factors that influence a model of service in which users are encouraged and enabled to explore resources independently:

Limitations of time for librarians. At an often busy enquiry and service desk, ‘you can’t spend that long with students there, unfortunately. We are kind of just directing them, showing them what is available, and it’s up to them to go further.’

—LIBRARIAN [LOWER RESEARCH INCOME UNIVERSITY, UK]

The need to offer 24/7 support. Students may be ‘working on [a] paper at 2 a.m. that is due at 8 a.m. the next day. And so at 2 a.m., there aren’t a whole lot of librarians around, so what is it that we can provide, if the student thinks about it, to direct them to a high quality resource?’

—LIBRARIAN [UNIVERSITY WITH ‘HIGHEST RESEARCH ACTIVITY’, USA]

The educative function of assistance. To assist users in conducting research independently, librarians are ‘less and less likely to recommend a specific resource. To help users in the longer run, giving them the subject guide gives them lots of different options, and there is less potential there for leading them to a dead end.’

—LIBRARIAN [UNIVERSITY WITH ‘HIGHEST RESEARCH ACTIVITY’, USA]

Limitations of time for users. ‘Whether or not I ask for help depends on whether or not I think it will save me time.’ —MA STUDENT [UNIVERSITY WITH ‘HIGHEST RESEARCH ACTIVITY’, USA]

The type of query. One student was unlikely to ask librarians what resources were available in a particular area. Their first step would be to check the library’s holdings, and then, ‘if I found out that we had [a relevant resource] ... I might ask them where to find it in the library.’

—UNDERGRADUATE STUDENT [LIBERAL ARTS COLLEGE, USA]

At this initial stage of research, users remain sensitive to time constraints and seek quickly to define the focus of their research and identify relevant sources, enabling them to move on and begin working through specialist works. This area saw the largest divergence between the resources librarians would see as the most appropriate and those to which users were most likely to turn. Most librarians interviewed suggested they were likely to recommend subject encyclopedia articles as a helpful point of orientation as users began to explore a topic. Subject encyclopedias were more frequently identified by librarian survey respondents as being important for undergraduates than for graduates and faculty (Fig. 2). This appears to reflect the impression that undergraduates are both more likely to be encountering wholly new topics and more likely to require guidance in navigating them. Qualities that interviewees valued in these resources included:

- offering a succinct overview of a topic;
- being compiled in a systematic fashion;
- listing named contributors, ‘so you can tell who has written it and what their authority is in the field’; and
- including selected bibliographies, listing ‘things that are particularly pertinent’.

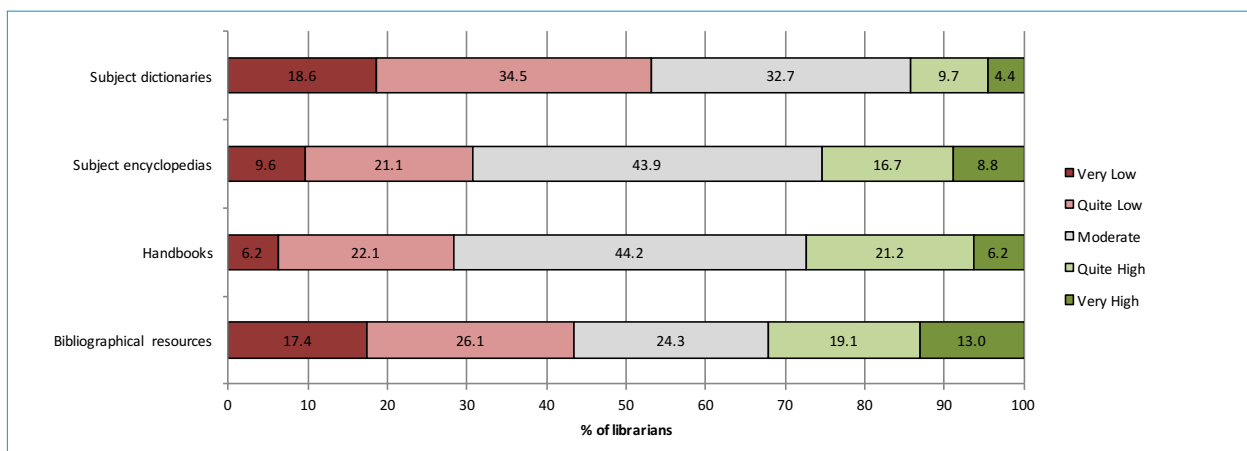
As one librarian explained:

‘[Ideal resources of this type should be] balanced between being comprehensive and brief, so they should give a good introduction without being too wordy or lengthy. They should be up to date if possible, and have a selective bibliography ... listing key readings and classic works, and so on.’ —LIBRARIAN [MEDIUM RESEARCH INCOME UNIVERSITY, UK]

As many librarians recognized, however, users were more likely to turn to Web searches and particularly to Wikipedia for such background information, despite expressing misgivings about these sources. One user explained that they would be used ‘just to get a loose understanding’ that would be verified or refined by other sources. A postgraduate student reported that they consulted Wikipedia less to read the main text of articles and more because ‘the bibliography and the reference section’ provide ‘sources that I can follow up with’. Users generally indicated a strong preference for resources in which they feel there is a good chance of finding material relevant to their topic, and this is applicable in this case: ‘With Wikipedia, you can find articles on obscure topics and people ... there is no limit on what can and cannot be included.’

As suggested by their reservations about the Web sources they consulted, users indicated a sense that some of their needs at this stage of the research process were not entirely met by the resources of which they were aware. With the exception of some faculty, users generally did not indicate awareness of subject encyclopedias in their subject area. One postgraduate student described the need for guidance as to the ‘foundational [scholarly] conversation around a topic. As a student, someone in the process of gaining expertise in a field, I need to know what is foundational and essential on a topic.’ However, this interviewee did not know of a resource that would provide such overviews. This perspective is more closely aligned with librarians’ views, which indicated a sense that such resources may be valuable to users, but that their levels of usage were relatively low (Fig. 3).

FIGURE 3 LIBRARIANS' PERSPECTIVE ON GENERAL USAGE LEVELS FOR REFERENCE RESOURCES



Q: In general, how would you describe the levels of usage at your institution, for the following types of resources? (N=113; 114; 113; and 115, respectively.)

Recognizing users' generally low level of familiarity with subject encyclopedias, librarians interviewed suggested that users may find individual reference articles relevant to their research in a discovery layer search. This is likely to depend heavily upon article-level indexing for such works. If a subject encyclopedia has only a title-level record, one librarian explained:

'From the title, you know kind of what it is about, but if you have a very specific topic, it is hard to know if it will be covered ... but being able to search across the full text ... helps to connect people to this reference content.' —LIBRARIAN [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

This view is matched by the perspective of a faculty member who fairly regularly used subject encyclopedias in combination with Web searches:

'I look for how much information they're going to give me on a particular topic. ... I'm looking for something that's recent, that I can get information from quickly, and that I can use to find other sources.' —FACULTY [MASTER'S UNIVERSITY, USA]

Users expressed some dissatisfaction with the suitability of Web sources to provide overviews of this kind. This suggests that the systematically compiled and authoritative, published resources that librarians favour may be valued by users. Users' accounts of their research behaviour, however, suggest possible explanations for the modest levels of usage of this type of content. Given their limited awareness of such sources, and in view of the constraints on their time, users were more likely to turn to familiar sources from which they were confident of obtaining information quickly, even if they expected that information to be imperfectly reliable. This would suggest that the usage of such published resources would depend heavily upon their discoverability, comprehensiveness, and ease and efficiency of use.

4.3 IN-DEPTH EXPLORATION

Once users have defined a research question and settled on an area of focus, they seek to identify the key issues relating to that particular topic and to establish how they have been discussed in the existing scholarship. Both librarians and users described a need for resources that sit between general introductory works and specialist research publications. A librarian described handbooks and companions as occupying this position:

'[They are situated] a bit higher than the introductory level, but not so high as the super-specialist journal article from an academic who has been studying it for years.'

—LIBRARIAN [HIGHER RESEARCH INCOME UNIVERSITY, UK]

An undergraduate student described a need for resources of this type in strikingly similar terms, but was uncertain of where they might be found:

'I think there are a lot of times when I would appreciate something between Wikipedia level and research paper level and that can sometimes be difficult.'

—UNDERGRADUATE STUDENT [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

Users described two main uses for such resources—offering guidance to the exploration of a topic that is the focus of a user's research; and providing a self-contained summary of a topic that is not their primary area of focus but is pertinent to their work. In contrast to the more concise reference works offering brief factual information, users were less likely to mention alternative resources that they used to serve a similar function. This may explain librarians' impressions of how usage of different categories of resources is changing, with fewer librarians reporting declining usage for handbooks than for any other type of reference work (Fig. 4).

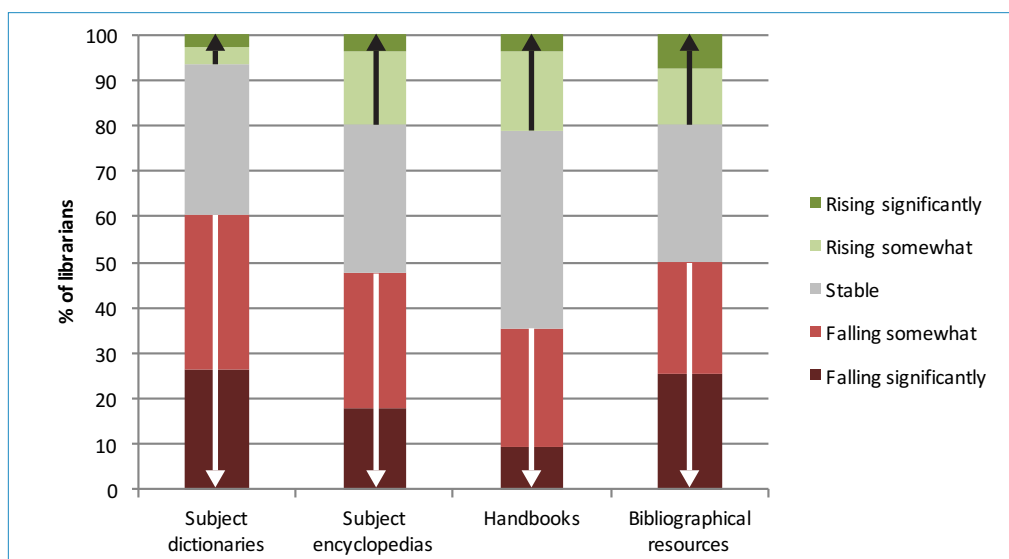


FIGURE 4
LIBRARIANS' PERSPECTIVE ON GENERAL USAGE TRENDS IN RECENT YEARS, FOR REFERENCE RESOURCES

Q: *In general, how would you describe trends in usage at your institution, for the following types of resources in recent years? (N=109; N=111; N=105; N=106, respectively.)*

4.3.1 Navigating Scholarship

Having settled on a research topic and identified the relevant terminology, most users suggested that they would quickly begin searching for relevant publications. This would generally involve conducting a wide-ranging search and working through abstracts to identify the most relevant results. In interviews, librarians most frequently mentioned subject-specific Abstracting and Indexing databases as the resource they would recommend to support users conducting detailed research on a defined topic. They regarded these as offering a systematic, focused, and perhaps user-friendly platform for searching:

‘Although it seems like more steps because you have to search 20 databases, you actually have more control and you can break it down into manageable chunks. You can’t do that with a discovery layer. You can’t say with confidence how many journals it’s searched and not found anything, but you can with databases.’ —LIBRARIAN [HIGHER RESEARCH INCOME UNIVERSITY, UK]

Users placed more emphasis on the difficulty of establishing which works within any substantial results set were of greatest relevance and importance. This difficulty, they suggested, frequently made systematic searches a laborious process yielding mixed results, such that guidance that might ease the process would be beneficial. The users most likely to identify a specific resource that could assist with this process were those working in the sciences who mentioned review articles as a valuable tool in this context:

‘In terms of looking for information in new areas, I would look at reviews first. You get all the information in one place and then you can go and look for more specific things.’

—POSTDOCTORAL RESEARCHER [RESEARCH INSTITUTE, USA]

‘Literature reviews ... concisely summarize a bunch of articles and so I can read one of those and pick out the top five research papers based on their references. It’s a faster way to pull out the important studies without having to read through an entire paper or abstract of results and then find that I don’t need it.’

—UNDERGRADUATE STUDENT [UNIVERSITY WITH ‘HIGHEST RESEARCH ACTIVITY’, USA]

In many of the Arts and Humanities and Social Science disciplines, literature review articles are less frequent, and few users mentioned them as likely points of orientation in the scholarship. Here handbooks or companions were more likely to be identified as useful sources of synthesis. As one faculty member explained:

‘The proliferation of the professional literature on any subject has now gone to such a degree that it’s either impenetrable to the general reader, or it’s hard work even for some of the experts. ... This has led to the rise of what we might call an intermediate sort of Reference work ... in which an expert writes, but writes in a fairly sophisticated way for people who are not experts, precisely because they can’t be expected to spend 3 weeks mugging up the subject.’

—FACULTY MEMBER [MEDIUM RESEARCH INCOME UNIVERSITY, UK]

Moreover, some faculty felt that inexperienced researchers may not fully recognize the need to situate a particular piece of scholarship in context:

'[Students research] in the most time-efficient way possible, which will often involve quick Google searches, which will often reveal sources that are much older. The reason for that is that these older sources have more often gone out of copyright, or circulated more widely, or are more known about. So, often, when I look down to a student's bibliography, you see this book was published in 1973, in 1958, etc. ... and they don't quite understand that knowledge is an evolving thing and a publication from 1973 will not contain the most up-to-date information.'

—FACULTY MEMBER [HIGHER RESEARCH INCOME UNIVERSITY, UK]

Another faculty member, noting that students searching for sources online would sometimes locate and use works first published in the nineteenth century, added:

'Honestly, students are going to struggle to sift through and distinguish quality scholarship from not-quality scholarship—they just don't have the background to be able to do that. And the fact that they rely on online sources so much makes that even harder.'

—FACULTY MEMBER [LIBERAL ARTS COLLEGE, USA]

This interviewee also felt that an integrated resource providing both summaries of key issues relating to a topic as well as an evaluation of the relevant scholarship would be valuable to students in helping them to navigate the large number of potentially relevant materials that they might identify in a Web-scale search. *'It would make it easier on the students and on me to say: if you're going to use online sources, this is where you want to start, and you can rely on the stuff here.'*

4.3.2 Interdisciplinary Research

Numerous librarians and users described cases in which users identify a topic that is relevant to their research project but which they do not necessarily need to explore in great depth. The growing significance of interdisciplinary work was especially prominent in this regard. Here, a relatively experienced researcher may require some orientation within the second subject:

'Going into different fields [of research], it's necessary to learn to speak the language of the other field and to try to get a sense of what the current research is doing: what are the established truths? What are the open questions? So you're really looking for a guiding voice to do that.'

—FACULTY MEMBER [HIGHER RESEARCH INCOME UNIVERSITY, UK]

Because they may use such resources for a variety of purposes, users look for a degree of versatility in them. Depending upon the nature of their research, users may be seeking a concise and self-contained overview of a topic, or guidance that will assist them in exploring further:

'If it's something ancillary to my argument, and I just need to know that I'm not off-base, then it's helpful just to have a short article that gives me a feel for where scholarship stands. But if I'm trying to get into subject matter where I'm trying to contribute something original, then obviously I need something longer that gives me a better sense of the range of options.'

—FACULTY MEMBER [LIBERAL ARTS COLLEGE, USA]

As well as growing in significance for researchers, interdisciplinarity is becoming an increasingly prevalent feature of university teaching. This was particularly noted by librarians:

'Particularly at the undergraduate stage, I'm getting a lot of students coming in who have a primary subject they are interested in, but who want to look at it through the lens of a secondary idea. So they might want to look at something historical through a lens of feminism or Marxism, but they don't know a lot about that second subject. [In response to queries like this] I'm looking for anything that's visibly obvious that it's at an introductory level.'

—LIBRARIAN [HIGHER RESEARCH INCOME UNIVERSITY, UK]

Both librarians and faculty agreed that students did not necessarily consider overviews of scholarship in terms of 'reference' content, or know where to seek such resources. They stressed, therefore, that such content must be discoverable and its function and value to users made clear. Despite general agreement that it is desirable that users can enter relevant resources from a range of possible access routes, there was some disagreement over whether the best way to encourage greater usage would be to focus on making relevant resources visible in a discovery layer and other Web-scale searches, or to direct users to a separate platform for reference content. Echoing users' emphasis on the appeal of resources in which they can be confident that they will find useful information efficiently, one librarian explained:

'I think I can sell them on the idea of consulting a Reference work, but if they have to go to 8 different sites to find that background essay they're looking for, I'm not as convinced that that is something they are going to do.' —LIBRARIAN [UNIVERSITY WITH 'HIGHEST RESEARCH ACTIVITY', USA]

User and librarian interviews suggest that in-depth reference resources are more likely to be seen as unique—with few alternative sources offering comparable information. There are indications that the needs for such sources are also growing, propelled by the increasingly narrowly focused and specialized nature of research publications, and by the growing significance of interdisciplinary research and teaching. This may explain why more survey respondents reported high levels of usage for this category of resources than for subject dictionaries and encyclopedias with more concise entries (Fig. 3). At the same time, interviews suggested that, as for all categories of reference resources, their utilization relies on users' familiarity with them and their discoverability.

5

Conclusion

Our in-depth interviews confirmed librarians' sense that for many users, and particularly for students, whilst reference resources remain potentially valuable in supporting research, the category of 'reference' is not well recognized and this inhibits users' awareness of the resources available to them. They showed that in searching for basic factual and background information, efficiency and convenience are highly valued. Consequently, the familiarity and ease of accessing freely available resources often, but not always, outweigh any concerns users may have about their authority. Usage of published resources in such cases would thus depend upon their discoverability and the ease and speed with which they could be used.

For more in-depth resources, the picture is rather different. As research publications become ever more specialized and narrow in focus, the challenge for students and researchers seeking orientation in a new topic becomes ever greater. Further, as interdisciplinary research and teaching continue to grow in significance, needs of this kind become increasingly prevalent. In this context, it appears that users value in-depth resources providing guidance to a field of study and its scholarship, and rarely know of adequate substitutes for such resources.

One concern expressed by librarians was that in-depth resources were sometimes neglected by users who would benefit from them. This was echoed by comments from those users who felt that such a resource would be helpful for their work but were not aware of where it might be found. As the routes by which users access scholarly content continue to change, the discoverability of reference resources is likely to be an ever-evolving challenge for users, librarians, and publishers.

Appendix: Further Reading

Bussell, Hilary, Jessica Hagman, and Christopher S. Guder, 'Research Needs and Learning Format Preferences of Graduate Students at a Large Public University: An Exploratory Study', forthcoming in *College & Research Libraries*. Preprint, <http://crl.acrl.org/index.php/crl/article/view/16617/18063>.

Dalal, Heather A., Amy K. Kimura, and Melissa A. Hofmann, 'Searching in the Wild: Observing Information-Seeking Behavior in a Discovery Tool', in Dawn M. Mueller (ed.), *Creating Sustainable Community: The Proceedings of the ACRL 2015 Conference* (Chicago: Association of College and Research Libraries, 2015), pp. 668–675).

Head, Alison J., and Michael B. Eisenberg, 'Finding Context: What Today's College Students Are Saying about Conducting Research in the Digital Age', *Project Information Literacy Progress Report*, 4 February 2009. http://www.projectinfolit.org/uploads/2/7/5/4/27541717/2009_final_report.pdf.

Head, Alison J., and Michael B. Eisenberg, 'Truth Be Told: How College Students Evaluate and Use Information in the Digital Age', *Project Information Literacy Progress Report*, 1 November 2010. http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil_fall2010_survey_fullreport1.pdf.

Lawrence, Kate, 'Today's College Students: Skimmers, Scanners and Efficiency-Seekers', *Information Services & Use*, 35, no. 1–2 (2015), pp. 89–93.

Leonard, Elisabeth, *The State of Reference Collections* (Sage Publications, June 2014).

Perruso, Carol, 'Undergraduates' Use of Google vs. Library Resources: A Four-Year Cohort Study', *College & Research Libraries*, 77, no. 5 (2016), pp. 614–630.

Smith, Linda C., and Melissa A. Wong (eds.), *Reference and Information Services: An Introduction*, 5th edn. (Santa Barbara, Calif.: Libraries Unlimited, 2016).

Notes

- 1 Indiana University Center for Postsecondary Research, *The Carnegie Classification of Institutions of Higher Education, 2015 Edition*. <http://carnegieclassifications.iu.edu/>.
- 2 Information on research income is derived from John Morgan, 'University Financial Health Check 2016', *Times Higher Education*, 2 June 2016. <https://www.timeshighereducation.com/features/university-financial-health-check-2016>.
- 3 Elisabeth Leonard, *The State of Reference Collections* (Sage Publications, June 2014), esp. pp. 4–6.
- 4 Andrew Richard Albanese, 'Reference: Alive and Clicking', *Publishers Weekly*, 12 May 2014, pp. 27–29 (pp. 27, 28). Many general trends are surveyed in Linda C. Smith and Melissa A. Wong (eds.), *Reference and Information Services: An Introduction*, 5th edn (Santa Barbara, Calif.: Libraries Unlimited, 2016).
- 5 Alison J. Head, 'Project Information Literacy: What Can Be Learned about the Information-Seeking Behavior of Today's College Students?', in Dawn M. Mueller (ed.), *Imagine: Innovate, Inspire: The Proceedings of the ACRL 2013 Conference* (Chicago: Association of College and Research Libraries, 2013), pp. 472–482 (p. 473).
- 6 Alison J. Head and Michael B. Eisenberg, 'Finding Context: What Today's College Students Are Saying about Conducting Research in the Digital Age.' *Project Information Literacy Progress Report*, 4 February 2009, pp. 7–10. http://www.projectinfolit.org/uploads/2/7/5/4/27541717/2009_final_report.pdf.
- 7 Numerous studies up to 2013 are reviewed in Jenny S. Bossaller and Heather Moulaison Sandy, 'Documenting the Conversation: A Systematic Review of Library Discovery Layers', forthcoming in *College & Research Libraries*. Preprint, <http://crl.acrl.org/index.php/crl/article/view/16634/18080>. More recent studies include Kristin Calvert, 'Maximizing Academic Library Collections: Measuring Changes in Use Patterns Owing to EBSCO Discovery Service', *College & Research Libraries*, 76, no. 1 (2015), pp. 81–99; Tracy Gilmore, Stefanie Metko, and Charla Gilbert, 'Sailing the Wide-Open Seas of Discovery: Assessing Students' Use and Perceptions of Summon for Conducting Research', in Dawn M. Mueller (ed.), *At the Helm: Leading Transformation: The Proceedings of the ACRL 2017 Conference* (Chicago: Association of College and Research Libraries, 2017), pp. 544–557.
- 8 Heather A. Dalal, Amy K. Kimura, and Melissa A. Hofmann, 'Searching in the Wild: Observing Information-Seeking Behavior in a Discovery Tool', in Dawn M. Mueller (ed.), *Creating Sustainable Community: The Proceedings of the ACRL 2015 Conference* (Chicago: Association of College and Research Libraries, 2015), pp. 668–675. For evidence of concerns about these issues among university faculty, see Christine Wolff et al., *Ithaka S+R US Faculty Survey 2015* (New York: Ithaka), 4 April 2016, p. 71. <http://www.sr.ithaka.org/publications/ithaka-sr-us-faculty-survey-2015/>.
- 9 Dalal et al., pp. 670–671.
- 10 Roger C. Schonfeld, *Does Discovery Still Happen in the Library? Roles and Strategies for a Shifting Reality* (New York: Ithaka), 24 September 2014, p. 8. <http://www.sr.ithaka.org/publications/does-discovery-still-happen-in-the-library-roles-and-strategies-for-a-shifting-reality/>.
- 11 On librarians' views and strategies for discovery starting points, see Christine Wolff, *Ithaka S&R US Library Survey 2016* (New York: Ithaka), 3 April 2017, pp. 37–39. <http://www.sr.ithaka.org/publications/us-library-survey-2016/>.
- 12 An influential discussion, first published in 1968, is Robert S. Taylor, 'Question-Negotiation and Information Seeking in Libraries', reprinted in *College & Research Libraries*, 76, no. 3 (2015), pp. 251–267.
- 13 John Danneker and Amanda Hornby, 'Leading from Unexpected Places through Collaboration: Undergraduate Libraries in the Research University', *Library Leadership & Management*, 31, no. 3 (2017), p. 10.

We'd love to hear what you think

Feel free to e-mail us at library.marketing@oup.com with your comments or to tell us if you'd be interested in participating in future research projects. You can also contact us on Twitter at @OUPLibraries with the hashtag #NavResearch.