An aerial photograph of a Dutch landscape. A winding canal flows through vibrant green fields. On the left bank, there is a traditional windmill and a cluster of buildings, including a large house with a red roof. The scene is captured in bright, natural light, highlighting the textures of the grass and the water.

Improving Open Access Discovery for Academic Library Users

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INTRODUCTION

Prompted by technological advances, globalization, and calls for action, the Netherlands' 2017 *Nationaal Plan Open Science* articulated shared national goals for the exchange of the results of research such as publications, data, methods, and practices.¹ These goals aimed to coordinate practical activities to realize the opportunities of open science: "Building on the essential principles of academic freedom, research integrity, and scientific excellence, open science sets a new paradigm that integrates into the scientific enterprise practices for reproducibility, transparency, sharing and collaboration resulting from the increased opening of scientific content, tools and processes."²

Open science and open access

Open science—"An inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community."³ Open science is sometimes referred to as open research or open scholarship to explicitly encompass a broader range of disciplines, such as the Arts, Humanities, and Social Sciences.

Open access—"Free access to information and unrestricted use of electronic resources for everyone. Any kind of digital content can be OA, from texts and data to software, audio, video, and multi-media."⁴

One goal of the 2017 *Nationaal Plan Open Science* was full open access (OA) to publications from all educational institutions and research domains in the Netherlands. Dutch libraries have dedicated a lot of effort and resources to achieving this. They've promoted and facilitated the process of OA publishing, negotiated read and publish agreements with publishers, and explored alternative

funding models. The Netherlands is making measurable progress toward the goal of full OA publication, prompting questions about whether publishing OA is advancing open science.⁵

Open science requires the production of open scientific knowledge and the discovery, access, evaluation, and use of that knowledge. Although OA content does not have a paywall, there might be a gap between being freely available and being discoverable to be accessed, evaluated, and used. To address this gap, OCLC's Open Access Discovery research project investigated how libraries can improve the discoverability of scholarly, peer-reviewed OA publications (henceforth OA publications) for their user communities. The project asked library staff at seven institutions in the Netherlands what they were doing to integrate OA publications into their users' workflows. Users at these same institutions were surveyed to see how library staff's efforts aligned with users' experiences with scholarly, peer-reviewed publications and OA.

Not just in the Netherlands, but globally, the rise of open access publishing mandates and practices has led to a steady increase in the OA share of total published scholarly output and a growing range of OA models.

Research and university libraries have been increasingly involved with open content activities.⁶ Not just in the Netherlands but globally, the rise of open access publishing mandates and practices has led to a steady increase in the OA share of total published scholarly output⁷ and a growing range of OA models. A 2018 survey found that nearly two-thirds of articles discovered by browsing came from a subscription.⁸ Although there is evidence that users prefer online access to the full text of publications,⁹ less is known about users' experiences discovering OA.

This report offers insights into library efforts and user behaviors at seven institutions in the Netherlands. Although these results are not generalizable given the limited number of participating institutions and the sampling strategies used, the results have implications for how these libraries can improve the discoverability of OA publications. The results can also serve as a starting point for academic libraries worldwide to have conversations about the best approaches for improving the discoverability of OA publications given local contexts and user needs.

Noteworthy findings from this study

1. Library staff wanted OA publications that were representative of the research published in the Netherlands. They primarily got this content from institutional repositories (IRs) but wanted to add OA publications from small Dutch publishers to their library collections more easily.

 2. OA publications were the most common type of open resource that users searched for. Users did not describe them as very easy to search for or access, which may be partly due to users' uneven knowledge about OA.

 3. Library staff's outreach and instruction had been primarily focused on increasing users' awareness of publishing OA. Users needed additional instruction on discovering, evaluating, and using these new types of publications.

 4. Users' most common response to encountering access barriers was to look for an OA version. In general, they preferred access options that were free to them, could be taken immediately, and did not require help from another person.

 5. Enhancing the discoverability of OA publications required reliable and consistent metadata beyond the basics, including persistent identifiers, licensing and versioning information, and peer-review status.

 6. Library staff called for more transparency and collaboration around metadata standards and system interoperability to make OA publications easily visible and help keep them top of mind with users.
-

Background

The OA Discovery research project was conceptualized and conducted in partnership with two Dutch library consortia: Universiteitsbibliotheken en Nationale Bibliotheek (UKB) and Samenwerkingsverband Hogeschoolbibliotheken (SHB). The project team worked with a steering committee and working group representing UKB and SHB libraries. These groups provided feedback and subject matter expertise and acted as liaisons between the project team and the consortia.

The UKB includes the 13 publicly funded university libraries of the Netherlands and the National Library. Universities offer bachelor's programs, one- and two-year master's degree programs, and PhD programs during which candidates are enrolled as researchers and teachers. Faculty at universities are typically focused on academic research. The SHB represents the libraries of all the publicly funded universities of applied sciences (UAS) in the Netherlands. UAS institutions typically offer four-year bachelor's degree programs and their faculty focus on applied research.

Phase 1: Library staff group interviews

In phase one of the OA Discovery research project, the working group and steering committee asked for participation from UKB and SHB members. Seven institutions volunteered for the study—four universities and three UASs. A group interview was conducted with each institution. In total, 37 people, primarily library staff, participated. Before the interviews, each institution was asked to complete a short survey ([appendix 1](#)). These data were used to customize portions of the semi-structured group interviews for each institution ([appendix 2](#)).

The group interviews were structured around four main topics of inquiry:

- Exposing metadata for the OA publications produced at their institution
- Selecting and adding OA publications to their library collections
- Helping their campus community discover OA publications
- Improving discoverability in collaboration with others

The seven group interviews were conducted virtually between 10 November 2022 and 12 January 2023. Interviews lasted approximately two hours and were video recorded and transcribed.

The transcribed interviews were analyzed using thematic and coding analyses. The group interview findings in this report were derived from the thematic and code summaries written during this process.

Library characteristics

At the time of the interviews, six of the seven libraries had been engaged with improving the discoverability of OA publications, two for one to five years and four for more than five years. A policy guided open access activities at these six libraries. A formal policy guided three libraries, and an informal understanding guided three. The seventh library was planning to begin work to improve the discoverability of OA publications and did not have a policy guiding this work.

The interview participants had a variety of titles: information specialists ($n = 16$), librarians ($n = 3$), managers including functional managers ($n = 10$), and specialists ($n = 8$). They also covered a variety of responsibility areas, including disciplinary liaisons ($n = 9$), e-resources ($n = 5$), library systems and tools ($n = 7$), metadata ($n = 4$), open access ($n = 7$), and repository and current research information system (CRIS) ($n = 5$). Fifteen of the participants were from UAS institutions, and 22 were from universities.

Phase 2: User survey

In phase two, the project team administered a survey to users at the seven institutions. The survey helped to contextualize what libraries were doing by situating library efforts within user behavior. To get the fullest picture of user behavior as it might pertain to OA publications, the survey was divided into the following sections:

- Demographics
- Searching for scholarly, peer-reviewed publications
- Barriers to accessing scholarly, peer-reviewed publications
- Open access

Where possible, questions were adapted from previous studies of information-seeking behavior. Because the target population included students, PhD candidates, researchers, teachers, and faculty, the project team was careful to word questions broadly and in ways that did not assume prior knowledge. Definitions and explanations of key concepts were included throughout the survey.

The survey opened on 1 April 2023 and closed on 28 April 2023. The project team worked with each institution to determine the best distribution method. Library staff at each institution volunteered to help by distributing the survey via their personal networks. Each institution also used a secondary distribution method through shared workspaces or email lists. Users could complete the survey in English ([appendix 3](#)) or in Dutch ([appendix 4](#)). In total, 461 responses were received; 179 were in English, and 282 were in Dutch.

User survey data were downloaded and cleaned, and open-ended questions were translated to English and hand-coded. Descriptive data analysis was followed by comparative data analysis between questions, subgroups, and institution types. It is noted in the findings when the comparative analysis explains the variation in the aggregate statistics.

User characteristics

The 461 survey respondents (336 from universities and 123 from UASs) were affiliates from the institutions included in the interviews.¹⁰ Prompted to select all their roles at their affiliated institutions, the largest number of respondents were professors ($n = 114$), followed by PhD candidates ($n = 106$) (figure 1). Eighty-four respondents selected more than one role. Universities had higher counts of professors, PhD candidates, master’s students, and bachelor’s students, while UAS institutions had higher counts of teachers and researchers.

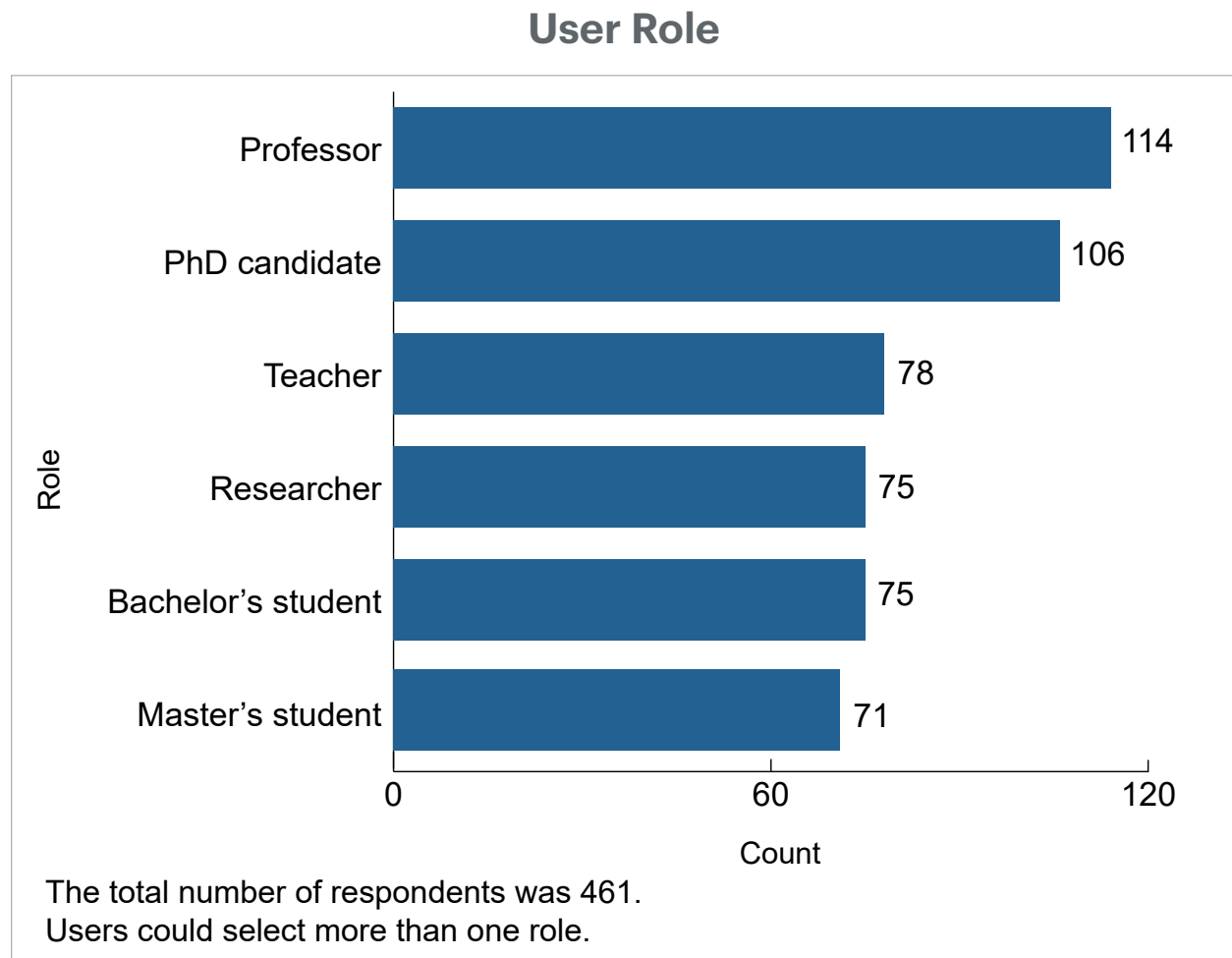


Figure 1. User role

Respondents were prompted to select all scholarly areas they were affiliated with (figure 2). Social sciences was the highest reported scholarly area ($n = 151$), followed by science, technology, engineering, and math (STEM) ($n = 145$). One hundred and six respondents selected more than one scholarly area. Universities had higher numbers of respondents in STEM ($n = 124$) and the social sciences ($n = 99$). The highest reported scholarly areas for UAS institutions were in social sciences ($n = 54$) and health sciences and medicine ($n = 47$).

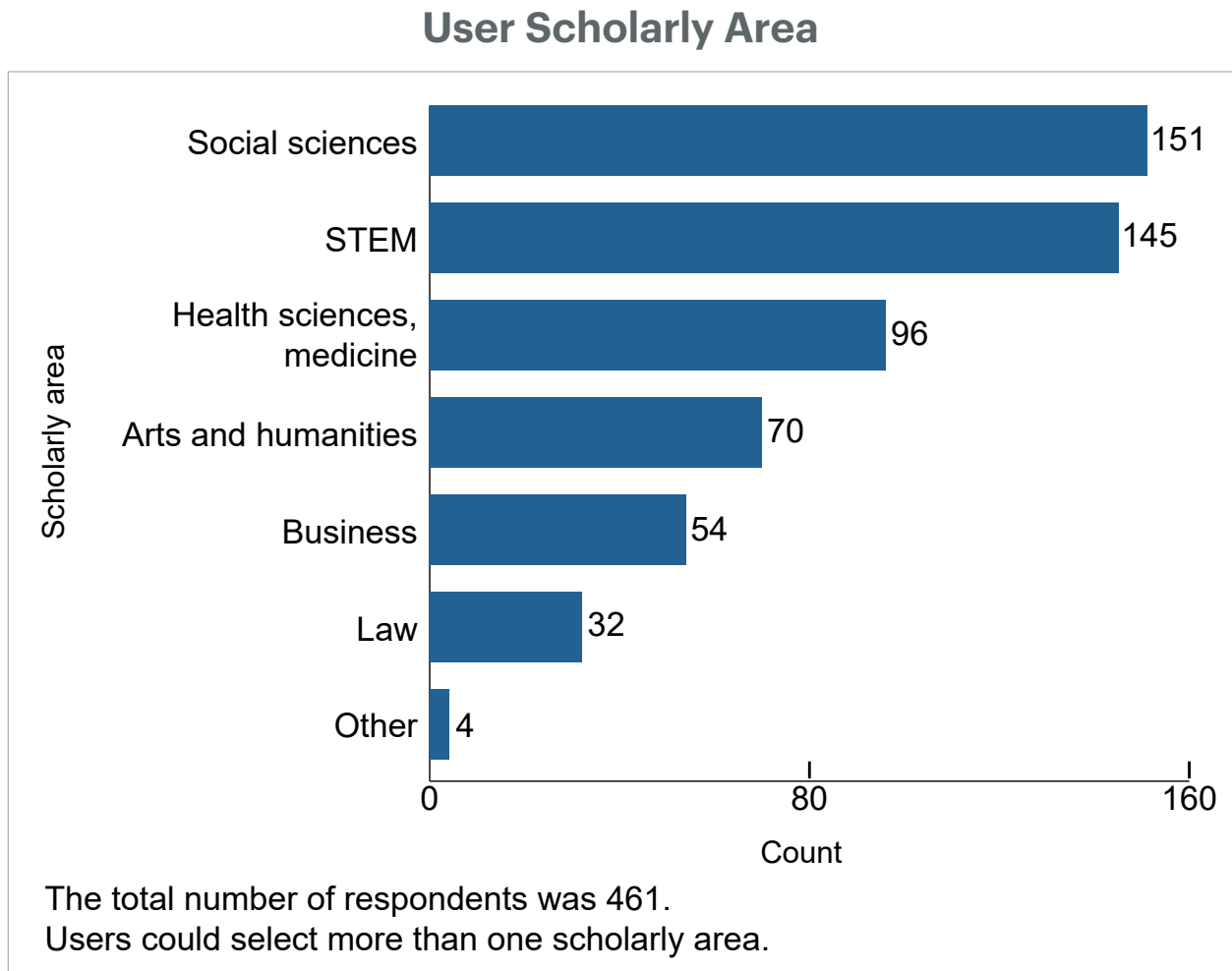


Figure 2. User scholarly area

Approximately half of respondents reported searching for or using scholarly, peer-reviewed publications on a weekly basis in the prior six months ($n = 242$), while roughly a third indicated doing so on a daily basis ($n = 130$) (figure 3). Professors ($n = 58$) reported daily frequency at higher rates, while teachers ($n = 44$), researchers ($n = 41$), PhD candidates ($n = 64$), master's students ($n = 45$), and bachelor's students ($n = 39$) reported weekly frequency at higher rates. Respondents from universities reported a mix of daily and weekly search or use, whereas those from UASs reported higher weekly search or use frequencies.

Search or Use Frequency of Scholarly, Peer-Reviewed Publications

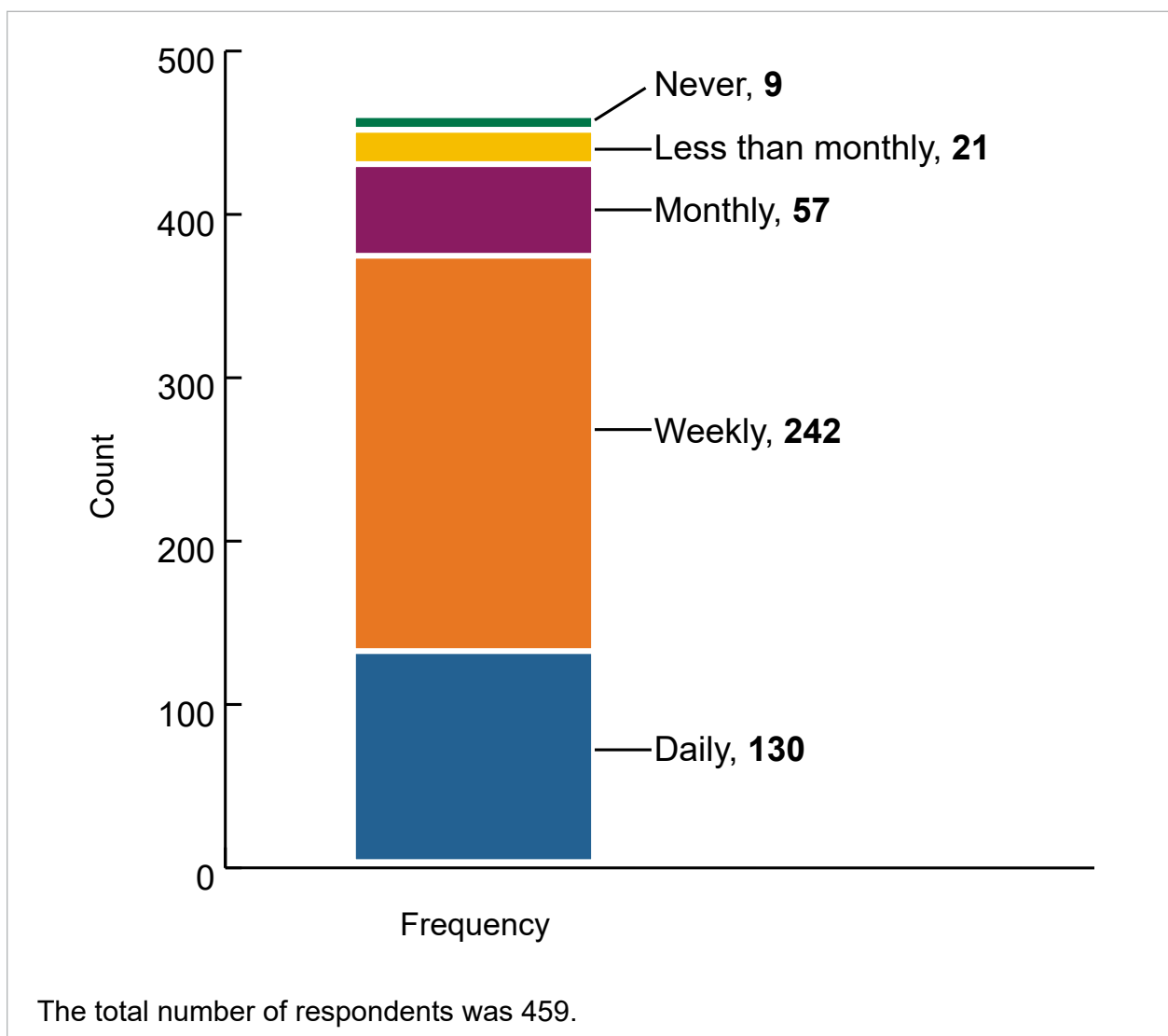


Figure 3. Search or use frequency of scholarly, peer-reviewed publications

Results

The findings from this study highlight what library staff at participating institutions in the Netherlands were doing to facilitate the discovery of OA publications, what opportunities they saw, and what challenges they faced. The findings also highlight users' experiences with scholarly, peer-reviewed publications and open access. Both perspectives are provided to show where staff efforts and user experiences were aligned and where improvements can be made. Each comparison results in a takeaway for library staff.

Where relevant, takeaways have also been added for publishers, technology providers, and aggregators. While data were not collected from these stakeholders, library staff's comments during the interviews sometimes had implications for ways that these stakeholders could help meet library staff and user needs. To make them easy to locate throughout the report, all of the takeaways start with the phrase "What this means for..." in magenta text and are surrounded by a magenta box.

The findings are organized into four areas.

- Selecting and adding OA publications to library collections
- Increasing OA awareness, knowledge, and engagement
- Improving metadata to support OA discovery
- Measuring the effects of library effort

When comparative analysis between institution types or user subgroups explains variation in the aggregate statistics, those differences will be called out in the text.

Each area ends with a Discussion section, where the findings are synthesized to provide an overall view and recommendations. These recommendations and conclusions may not be broadly applicable as the OA publishing landscape varies regionally. However, they may serve as useful conversation starters on strategies for improving the discoverability of OA publications worldwide.

Selecting and adding OA publications to library collections

Library staff across both institution types used a similar set of core criteria to select OA publications. They wanted relevant, trustworthy OA publications for the various scholarly areas at their institution, with a good representation of the research being conducted in the Netherlands. However, OA publications did not fit into traditional collection development processes. Library staff made varied decisions about managing OA publications in library collections based on their policies, systems,

and philosophy on the value of adding OA to library collections. They also looked for ways to put OA publications where their users were by incorporating them into various user workflows. User responses confirmed that these efforts were worthwhile. While search engines were the most popular place for users to search, the library search page was in the top three. Users primarily wanted full-text online access to relevant, peer-reviewed publications. Users' preferences confirmed it's worthwhile for library staff to add OA publications to library collections and integrate them into various user workflows both within and outside the library.

Selection criteria for OA publications

Five of the seven libraries had an OA policy that guided collection development. All libraries estimated that OA publications constituted less than half of their collections. Six libraries had gold, green, and hybrid OA in their collections, five had diamond OA in their collections, and one did not know.

Types of OA¹¹

Diamond OA—Immediate open access publication by a journal or book publisher without payment of a processing charge.

Gold OA—Immediate open access publication by a journal or book publisher usually on payment of a processing charge.

Green OA—A version of the author accepted manuscript is archived online such as in a repository.

Hybrid OA—Some articles in a journal or chapters in a book are made open access on payment of a processing charge.

The OA publications that were part of their read and publish agreements were automatically added to their discovery systems. These transformative agreements for subscription content and OA publishing were negotiated nationally on behalf of all libraries.

Library staff browsed hundreds of OA collections from publishers and OA platforms within central indexes and/or knowledge bases to select and add to their discovery system. The number of collections made evaluation difficult. Lack of time and a lack of models for evaluating new OA publishers were factors.

Because I think a lot of content that is published open access by others than the traditional publishers, it's as meaningful as the traditional publisher, but we don't know how to value them or how to make sure that it's good information. (Open access information specialist, UAS2)

For these reasons, staff at some libraries only relied on recommendations from their users and colleagues at their library. Others had library staff work together to choose OA collections or get recommendations from colleagues at other libraries as a benchmark.

Despite evaluation challenges, a common set of selection criteria emerged. For library staff at both types of institutions, OA was not the first consideration when selecting scholarly, peer-reviewed publications. Relevant content was the priority. Library staff searched for OA sources they believed their campus community wanted or needed, not OA for its own sake. They looked for content that was useful, important, and interesting to their users.

But for me, it's about making sure . . . to have the most expansive collection of qualified knowledge that we want to make available to researchers. And it doesn't matter if it's open access or not. (Metadata specialist, U2)

The goal was not to replace subscription-based publications with OA publications but to prioritize users' needs.

Library staff wanted OA publications that were not only relevant but also trustworthy. Staff had concerns about OA publishers, particularly those who were new, because the quality of their editorial services was unknown. Their circle of trust was small when selecting which OA sources to make available to their users. As library staff at one institution explained, "You don't want all open access results. . . . You want the ones you have selected as materials, you well trust. . . . That quality label that you want to give, this is something that is important" (Library systems manager, U4). In addition to recommendations from library and user communities, staff selected OA collections from well-known traditional publishers and specific OA platforms that had a reputation for vetting and curating a variety of high-quality publications.

Library staff at both types of institutions also wanted OA publications that were representative of the research published in the Netherlands. They relied on OA collections from their own institution and from all other Dutch institutions made available through national Dutch aggregators. Staff at UAS institutions were also interested in OA publications from small Dutch publishers that were unavailable through central indexes and knowledge bases.

The current discovery tools, they have a central index in which there's mostly international content but not enough Dutch content. So, we have a lot of Dutch databases, and the content just can't be found by the discovery tool. So, the users will get a skewed view of what is available, and the decision was made that we should try to direct the users mainly to the sources themselves, so the individual databases. The discovery tool is a really nice and user-friendly system with a lot of options. . . . But I think one shouldn't exclude the other. (Library systems and tools specialist, UAS2)

Staff also discussed instances when they found Dutch OA journal titles without the associated articles in discovery systems. This raised questions about how to make article-level metadata a priority for both the discovery system providers and the publishers. Staff were uncertain whether these OA publishers could be convinced to spend their limited resources preparing and providing article-level metadata to knowledge bases when it was already discoverable online.

What this means for publishers, technology providers, and aggregators:

Ensure that article-level metadata is provided by all publishers, regardless of size. This makes it easier for library staff to add these OA publications to their collections to meet users' needs.

Managing OA publications across library collections

Selecting and adding OA publications occurred outside of library staff's traditional collection development workflows. Most collection development decisions and workflows were anchored around subscriptions, purchases, and contract negotiations, and library systems were typically built to handle content that came into the library in one of these ways. All of the institutions had catalogs for the material they acquired. Six of the institutions had a discovery system that provided access to subscribed content, owned content, and OA content. Some of the OA content in the discovery system had been funded by the institution, and some had not. All seven had an IR and the four universities also had a CRIS. They used these systems for content produced by their institution, both OA and not. Managing OA publications added to the complexity of these systems and ownership models.

Library staff helped institutional authors add their OA publications to the CRIS and IR and then used APIs or harvesters to add them to their discovery systems.

OA publications funded by the library or institution were easily conceptualized as part of library collections but adding them to systems often required additional work. In the context of OA, publications were considered funded by the institution not only on the payment of article processing costs (APCs), but also for the author's labor to create the publication, for the creation of metadata records and storage in the IR or CRIS, and, in one instance, funding for an external initiative that helped to promote OA publishing. Library staff helped institutional authors add their OA publications to the CRIS and IR and then used APIs or harvesters to add them to their discovery systems. Most of the libraries also added national aggregations of Dutch institutional output to their discovery systems as collections. Although the

national Dutch aggregator collections duplicated content added from their local repositories, library staff accepted this duplication to ensure their users could access OA publications from all other Dutch institutions.

OA publications not funded by the institution were a less comfortable fit as part of library collections. Institutions had different policies about adding them, and library staff had varied perspectives on the value of adding them and how they should be managed. While some participants saw adding OA as valuable by default, others wondered why they should add OA publications to library collections when they were discoverable on the open web and hadn't been paid for by the library.

We see that from our own usage statistics that many students, many researchers, they find content by going to [the search engine] and not by our own discovery tool. So I don't think we are the most important player in improving the discoverability of this open access content. Of course, we should contribute whatever we can, but I think we have to be realistic and realize that there are more important players in the field. (Disciplinary information specialist, U3)

Library staff recognized that library systems were not the most common place users searched. Regardless, some wanted to do their part to make OA publications discoverable within their collections.

It was simple for library staff to add external OA publications by turning on publisher and OA platform collections through the central index or knowledge base within their discovery systems. The more challenging issue for these collections was evaluating them and managing the duplication that occurred when OA publications were packaged into multiple collections or when publications had both OA and purchasable versions. There was often not enough high-quality metadata to allow them to identify different versions, compare easily across collections, and merge duplicate records. Participants at one institution pointed out that they didn't mind the duplication per se but wanted reliable persistent identifiers to be able to merge the duplicate records to reduce confusion among their users.

We said this before, if you have multiple sources, then we will get a lot of duplication. . . . I mean, we can add records together to some extent, but this is mainly because the metadata is not [consistent] between the different platforms, so if they would be more alike, then it would be easier to simply add all duplicates within one record. (Repository and CRIS manager, U1)

Some institutions preferred to limit the amount of OA they added to their discovery systems, for instance, by only adding collections from trusted OA platforms with broad coverage of vetted OA publications.

What this means for publishers: When adding OA publications to knowledge base collections, clearly name the collection and identify what types of OA resources are in the collection and how much of it is OA. Provide this information consistently to help libraries identify the content they are looking for within the potentially duplicated records.

Putting OA where users are

Staff were looking for new ways to integrate library collections into users' workflows that did not require users to start their search within library collections. They integrated library collections into teaching and learning workflows by creating course-specific guides to resources for teachers and students and by including library resources within the learning management system (LMS).

We have a button in [the learning management system]. . . . And people know that by clicking . . . you see the page with all the content we have, all the digital content, but also the library catalog. But most of the time students find links to e-books to open access journal articles to databases in [the learning management system]. (Information specialist, UAS4)

Wanting to influence the development of the curriculum through thoughtful curation of OA content, staff at both types of institutions also expanded their reach into LMSs and reading list management software in new ways. Staff at one institution initiated a review of LMS content for copyright compliance and planned to work with instructors to find OA alternatives as needed. Staff at other institutions were working closely with instructors to provide OA content for courses such as articles, journals, databases, textbooks, and open educational resources (OERs).

Library staff were also interested in integrating OA content into users' general discovery workflows. Staff at all institutions wanted their campus communities to install and use OA browser extensions. This software directed users to an OA version of a publication during discovery outside of library systems. Some OA browser extensions could also be integrated with library subscriptions to search for an OA version when a particular publication was unavailable within the library's collections.

So, basically, it [the OA browser extension] knows our subscriptions, but then . . . it also throws that DOI towards all the different repositories that there are around the world. And I think [it] makes the selection of which of those repositories are qualifying, basically. And then if it hits an open access article, it refers directly to the PDF. (Metadata specialist, U2)

Library staff at some institutions had been promoting or planning to promote OA browser extensions on campus to encourage their installation and use. Others were pre-installing them on institution-issued laptops but not necessarily on their users' browser of choice.

Although library staff worked to make library collections a central place to discover OA publications, they recognized the need to also find creative ways to put these publications into users' workflows, especially for users who start their search outside of library collections.

Staff at one UAS wanted to integrate the library into the student life workflow through an institution-specific app, but progress was slow. The app served as a central portal to access information about all aspects of student life.

You have to be there where the students are . . . we really want to be in . . . this [UAS4] app where they can find us easily. So that's a challenge for the next year. . . . We're working on it, but it's going slowly, slowly, slowly.
(Disciplinary information specialist, UAS4)

Although library staff worked to make library collections a central place to discover OA publications, they recognized the need to also find creative ways to put these publications into users' workflows, especially for users who start their search outside of library collections.

User experiences and behaviors

Results from the user survey support library staff's approaches to selecting and managing OA publications for library collections and incorporating OA publications within users' various workflows within and outside of library collections. When users were prompted to select all the systems where they normally searched for scholarly, peer-reviewed publications, search engine ($n = 390$) was the highest-reported system (figure 4). Database (such as Scopus, Web of Science, PubMed, Nexis Uni, and JSTOR) ($n = 319$) was second, and library search page or catalog ($n = 202$) was third. Research sharing site (such as ResearchGate, Sci-Hub, Academia.edu, Library Genesis) ($n = 149$), publishers' website ($n = 126$), and institutional repository or portal ($n = 105$) were less common places for users to search. Very few users reported searching on an OA platform (such as DOAJ, DOAB, HBO Kennisbank, CORE, OpenAIRE).

Where Users Normally Search for Scholarly, Peer-Reviewed Publications

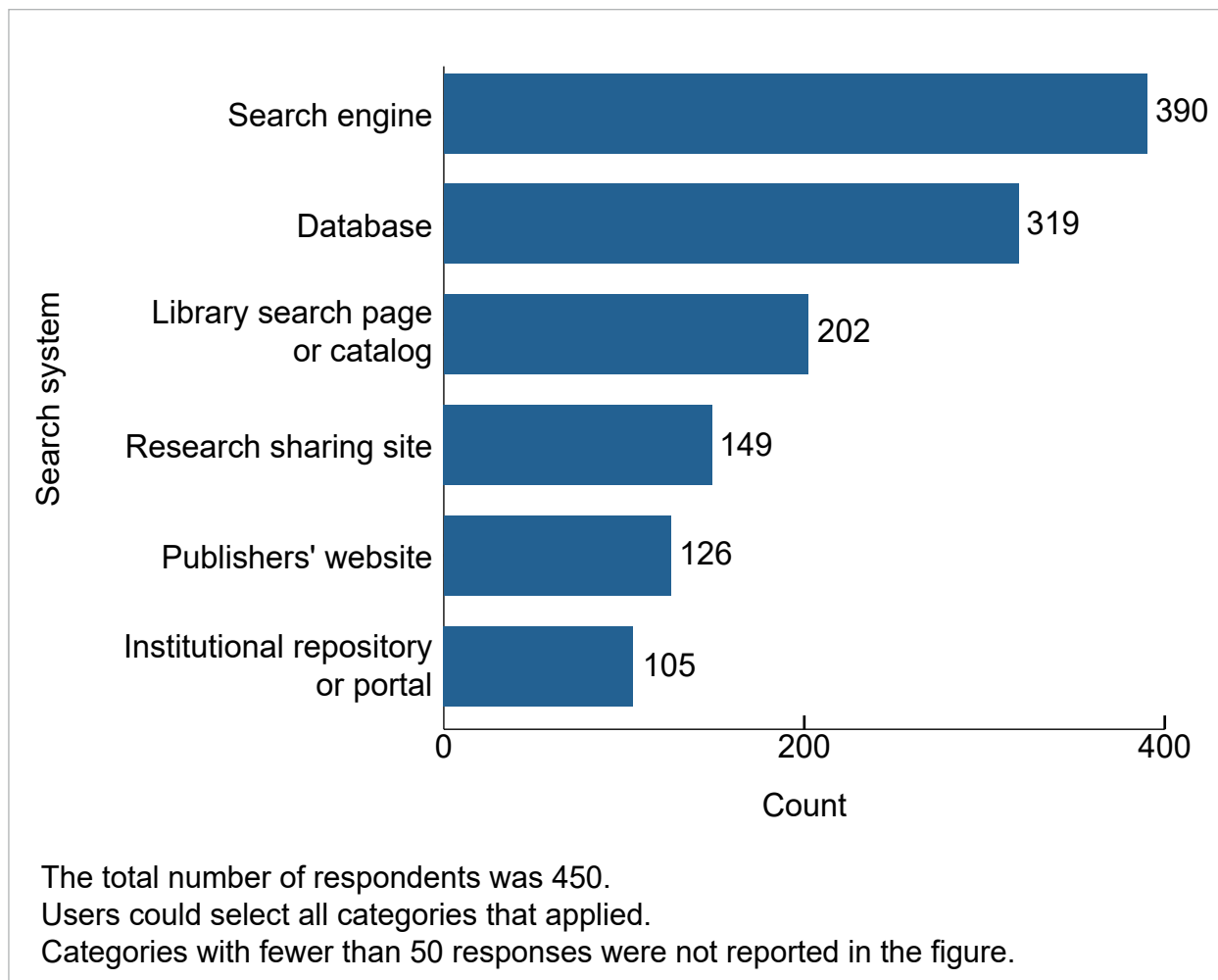


Figure 4. Where users normally search for scholarly, peer-reviewed publications

While library staff were correct that the library is not the first place that users search, it was in the top three most common systems. Users' selections suggest a preference to search for scholarly, peer-reviewed publications in systems that returned various publication types. This preference supports library staff's decision to add OA sources, such as institutional repositories or portals and other OA platforms that users did not normally search, to library collections.

What this means for library staff: Incorporating OA publications into library collections, particularly those from national aggregators of Dutch institutional repositories or portals and other OA platforms, is likely to enhance their discoverability because users don't normally go to these sources independently.

Users prioritized relevance and full-text availability when searching for scholarly publications. They were asked to rank the importance of nine factors (table 1). Each row represents one factor that users could rank, and each column shows the number of users who chose that rank. The highlighted cells with the highest count for the row indicate the most commonly selected rank for each factor.

Users most commonly ranked subject relevance as the most important ($n = 248$), followed by full-text availability ranked second ($n = 104$). Understanding the content and peer review were most commonly ranked third ($n = 77$ and $n = 73$, respectively). They were followed by published recently, which most commonly ranked fifth ($n = 73$). Journal or publisher’s reputation most commonly ranked sixth and seventh ($n = 77$ each), whereas the author’s reputation ($n = 88$) tied for eighth with publication is OA ($n = 75$). The physical or print item is available option was most commonly ranked ninth ($n = 283$).

Table 1. Important factors when searching for scholarly publications

Factors	Rank of importance for each factor								
	1	2	3	4	5	6	7	8	9
Subject is relevant	248	61	31	19	13	5	1	9	28
Full text available online	64	104	79	44	38	26	22	22	12
I can understand the content	13	43	77	73	65	47	47	34	10
It has been peer reviewed	24	70	73	63	56	51	43	23	6
It was published recently	13	49	48	64	73	66	53	38	6
Journal or publisher’s reputation	11	19	51	45	52	77	77	61	18
Author’s reputation	3	27	18	38	59	70	75	88	30
Publication is OA	15	30	36	57	52	57	68	75	18
Physical or print item is available	30	10	3	5	2	8	18	53	283

Note: The total number of respondents was 429. The highlighted cells with the highest count for the row indicate the most commonly selected rank for each factor.

Library staff were meeting the top three priorities users had when searching for scholarly publications by selecting relevant, trustworthy OA publications. The main difference was that staff prioritized journal or publisher reputation over peer review when determining what was trustworthy. They did this to avoid publishers who were not providing expected editorial services, such as rigorous peer review. Knowing how to evaluate publishers and the quality of their publishing services is particularly important for search engine users because search engines, unlike libraries, do not curate trustworthy content.

What this means for library staff: Provide users more guidance about how to evaluate whether a scholarly publication is trustworthy, including reasons why it's important to consider the journal, publisher, and author's reputation in addition to whether the publication has been peer-reviewed.

Although OA was a less important factor when searching for scholarly publications, the majority of users did search for OA publications as well as other types of OA resources. Users' demand for OA publications supports library staff's efforts to make OA publications discoverable. Scholarly, peer-reviewed OA publications were the most common type of OA resource that users searched for ($n = 333$) (figure 5). They accounted for more than twice the reported counts for all other resource types, including open educational resources (OERs) ($n = 138$), open data ($n = 135$), digitized collections ($n = 119$), open media ($n = 119$), preprints ($n = 119$), and open-source software ($n = 100$). A small number of users reported not searching for OA resources at all.

Types of OA Resources Users Searched for

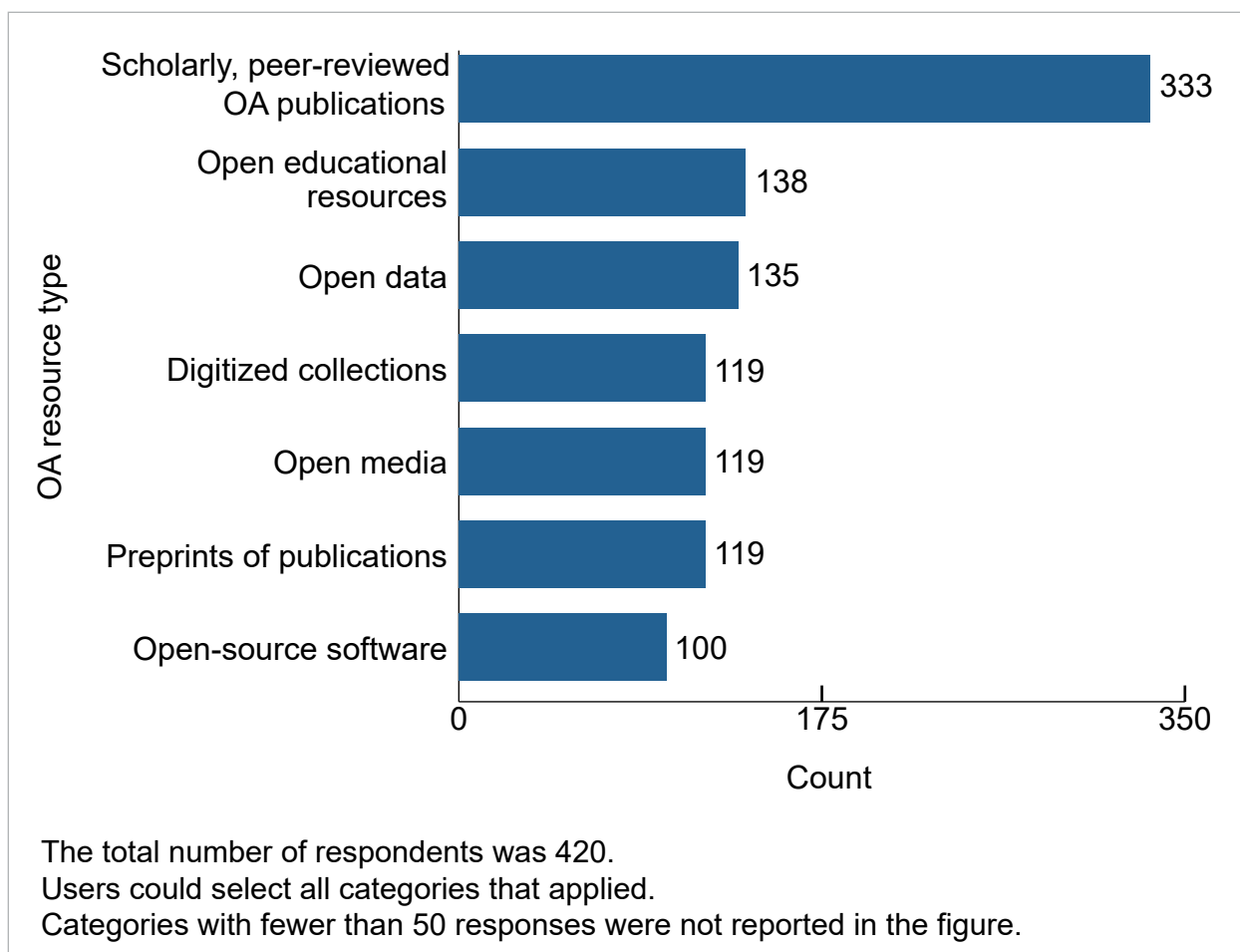


Figure 5. Types of OA resources users searched for

Users at both types of institutions reported searching for OA publications more than all other OA resources. Users from universities reported higher counts for open data ($n = 104$) and open educational resources ($n = 94$), whereas users from UASs reported higher counts for open educational resources ($n = 42$), open media ($n = 39$), and open digitized collections ($n = 37$).

What this means for library staff: Library staff's work to increase the discoverability of OA publications is and will continue to be critical to meet user needs. Library staff will need to identify which users are engaging with different types of OA resources and incorporate them into user workflows accordingly.

Despite library staff's enthusiasm about the potential for browser extensions to help users access the full text of OA publications, two-thirds of users ($n = 269$) indicated that they did not use a browser extension for that purpose (figure 6). Those who did ($n = 141$) reported using a variety of OA browser extensions. This suggests that browser extensions had a low adoption rate and that there was no consensus about which one was preferred.

Use of Browser Extensions to Access OA Publications

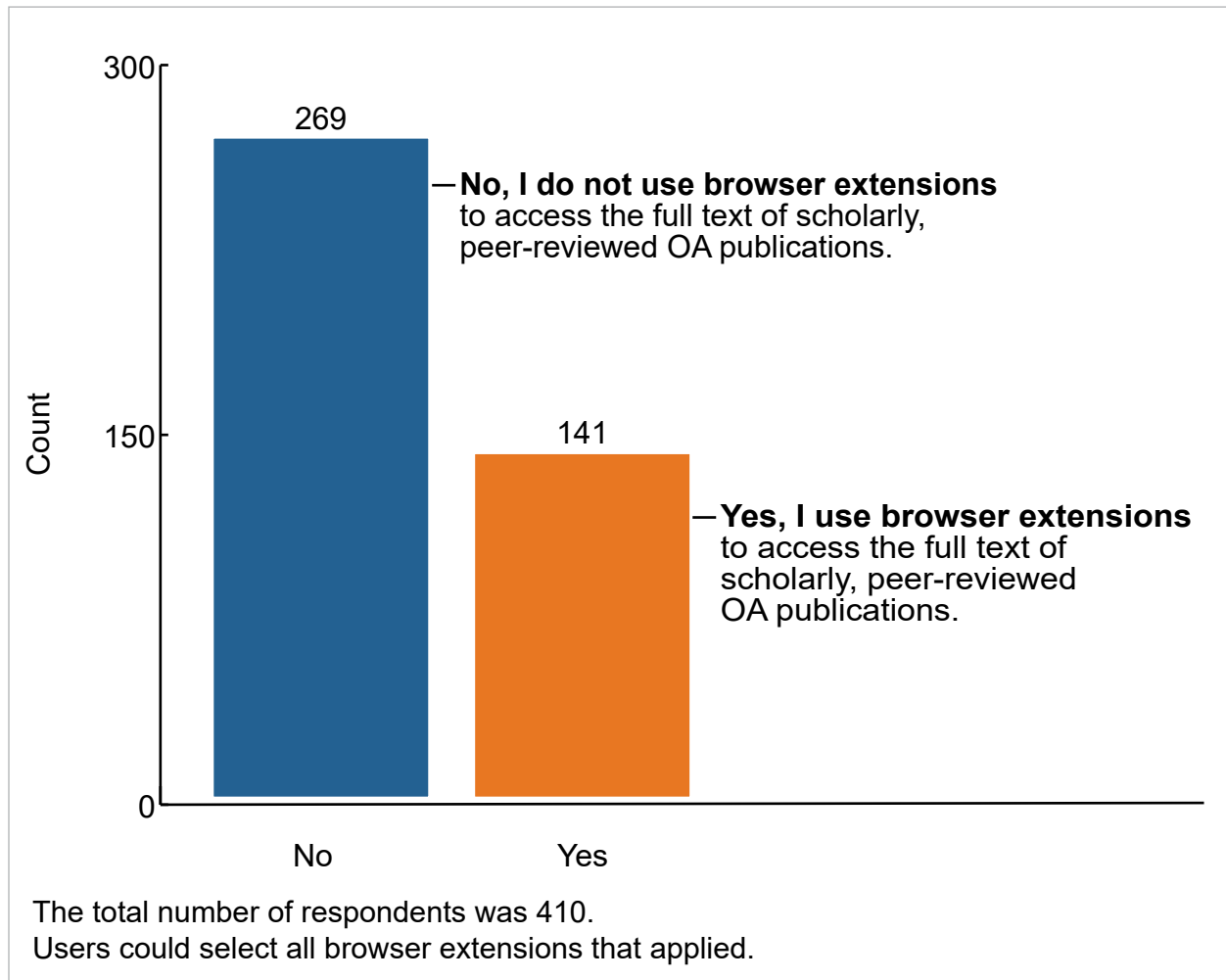


Figure 6. Use of browser extensions to access OA publications

Knowing users normally use search engines to find scholarly, peer-reviewed publications, library staff believed OA browser extensions could be a powerful way to integrate OA publications into users' workflows. Yet few users have installed these browser extensions, even though they connect users with free and legal OA copies of the resources they want.

What this means for library staff and technology providers: Browser extensions, both those that integrate with library collections and those that only search for OA versions, can be valuable options for improving users' discovery experiences. Library staff and technology providers need to promote these tools to help users adopt them into their discovery workflows.

Discussion

As libraries continue to navigate the transition to OA, decisions must be made about incorporating OA publications into library collections. An OA policy guided collection development at several libraries. However, library staff tended to limit the amount of OA they added to library collections to avoid challenges such as evaluating OA collections in the knowledge base and managing the duplicate records some of those collections created. They primarily relied on requests and recommendations from users and library colleagues and selected OA collections from well-known publishers and a few trusted OA platforms. Despite most users searching specifically for OA publications, very few of them went directly to IRs or OA platforms. Because the library search page was a common place for users to search, adding OA publications to library collections will likely make them more discoverable for users.

Regardless of the amount of OA in library collections, collection development policies and practices will need to be updated to articulate the role of OA, ensure that library activities are consistent with the institution's OA plans and policies, and meet user needs. Based on users' stated preferences, library staff should also promote library collections and emphasize the library's role as a provider of relevant, trustworthy full-text content online, including OA and non-OA publications.

In addition to discovery systems and library websites, library staff wanted to provide resources through LMSs, browser extensions, and student life apps. Their goal was to integrate library collections into users' various workflows to provide materials at the point of need. Their progress was uneven, and work was still needed to build user awareness and institutional collaborations. Library staff will need to consider the various user workflows where OA can be added and choose which to pursue based on users' search behavior and needs, library time and resources available, and interest from needed collaborators.

Increasing OA awareness, knowledge, and engagement

Library staff had been focused on outreach and instruction to help their users publish OA and were beginning to see success in this area. They had recently begun incorporating information about discovering OA publications into their outreach and instruction efforts, but there were opportunities for them to integrate OA more deliberately in library services. Users' survey responses paint a complex picture of the role of OA in their discovery journey. Users did not find OA publications very easy to search for and access, and nearly half reported not knowing much about OA. However, they relied on OA alternatives when they encountered barriers to full-text access. The increasing amount of OA publications affects the downstream processes of discovery, access, and use, but users may not understand these effects. Library staff will need to focus efforts on these downstream processes to help their users adapt.

Outreach and instruction to promote the publication of OA

Six of the seven institutions reported that an OA policy guided outreach and instruction. Library staff at several institutions acknowledged that until recently, their outreach and instruction work with users was primarily focused on publishing OA rather than discovering it. Participants mentioned efforts to raise authors' awareness of university commitments to publishing OA, OA publishing deals, and the need to deposit publications in the IR or CRIS.

Both universities and UASs had national deals with publishers that supported OA. Staff consulted with authors on the different ways to publish OA and the types of journals and licenses available. They also helped authors navigate read and publish agreements and APCs. Their long-standing efforts were beginning to make an impact.

We have a lot of open access deals that people can publish open access, and we communicated about that, and you never know what the impact is, but we now find after years and years, we find that most researchers find the options and use those options. (Disciplinary information specialist, U4)

Library staff had mixed success getting authors to deposit publications (such as author accepted manuscripts) in the IR or CRIS. Library staff mentioned authors often forgot about the need to deposit their OA publications, didn't have time to deposit, or didn't see the importance of doing so.

More urgent internal problem that we should handle and that's that a lot of the writers, the authors forget to send in their publications for us to be put into the repository . . . even some of the professors themselves publish and then forget to send in a copy or at least or a link or any mention to our web app. We have a special email address where they can send in their publications, and that's where they get stuck all the time. (Disciplinary information specialist, UAS1)

Five institutions, including all universities, reported that the number of OA publications their campus community authored in the last three years had increased. For universities, the most common OA publication types authored by their campus community were gold OA and hybrid OA, and the most common types for UASs were gold OA and green OA. One UAS mentioned they were still in the beginning stages of getting authors to publish OA.

Participants from two of the universities saw promoting OA publishing as the way to continue. A couple of participants wanted universal OA because they thought it would simplify publishing and improve publications' discoverability by default. Some participants saw institutional or library-led publishing as a way to help increase the amount of OA, including the university press recruiting authors to publish OA and the library using the IR as a platform for small OA journals.

Integrating OA discovery into library services

Library outreach and instruction to promote the discovery of OA publications was still in the early stages or anticipated. For these services, OA was an incidental rather than an intentional component. When library staff created tutorials, added to their website, or offered instruction, OA was not their focus. Discovering relevant content was.

Information about discovering OA publications was being folded into existing information literacy instruction about searching for and accessing information rather than presented as a standalone course. Library staff focused instruction on how to find and evaluate content that met users' needs. OA sources were mentioned, but only when they were relevant options. Even at institutions that offered information literacy instruction, not all of the students received it. This left a large number of students who weren't learning about OA through the library.

Library staff at all of the institutions were doing something to provide information about OA publications on their websites. They often provided links to trusted OA sources within disciplinary or course-specific guides, including relevant OA sources not in library collections. They created guides and tutorials with information on full-text access or getting PDFs via the library collections as well as OA sources and tools. Several participants acknowledged that this was an area where more could be done.

Library staff's one-on-one interactions with users also provided the opportunity to introduce OA sources. Staff at a few institutions mentioned filling ILL requests with OA publications while giving users additional information about how to find and access OA publications in the future. A few also referred their users to specific OA platforms or browser extensions that would help meet needs.

[Library staff] wanted their users to recognize OA publications in search results lists, view OA publications as valuable resources, and accept the OA databases and textbooks that library staff find for them.

Library staff identified a few goals they wanted to accomplish as they adapted their services to facilitate the discovery of OA publications. They wanted their users to recognize OA publications in search results lists, view OA publications as valuable resources, and accept the OA databases and textbooks that library staff find for them. Staff at one institution pointed out that it would be most important for users to be able to verify the quality and trustworthiness of content in an all-OA world. Staff at another institution had recently decided that everyone in their library needed to incorporate OA into their work and be knowledgeable about it, moving toward a more holistic approach in library roles and user services.

User experiences and behaviors

Although OA publications were freely available, results from the user survey show they were not very easy to discover or access. Asked to describe their experience searching for and accessing OA publications, roughly a quarter of respondents found it very easy to access OA publications ($n = 100$), and fewer found it very easy to search for them ($n = 80$) (figure 7). Most users reported it was somewhat easy to search for and access OA publications ($n = 222$ and $n = 177$, respectively). The remainder reported it was somewhat difficult or very difficult to search for and access OA publications ($n = 71$ and $n = 101$, respectively).

User Experiences Searching for and Accessing OA Publications

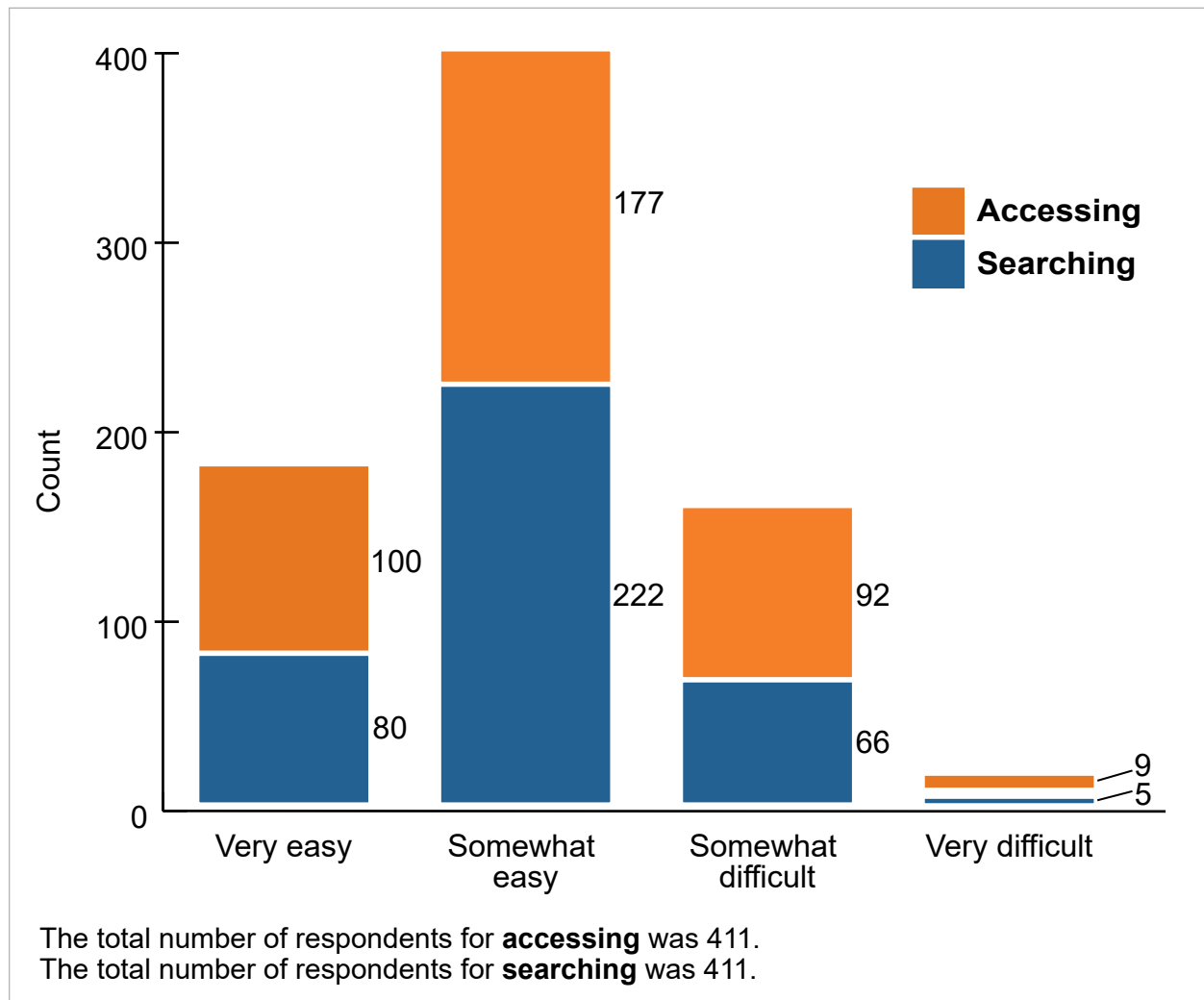


Figure 7. User experiences searching for and accessing OA publications

While OA publications are freely available, having a less than very easy experience searching for and accessing them may be partly due to users' uneven knowledge about OA. While almost all respondents had heard of OA, just under half reported that they knew a lot about it ($n = 195$) (figure 8). However, a similar proportion reported that they did not know much about OA ($n = 201$), while 24 reported never having heard of it. There were slightly higher concentrations of users who reported knowing a lot about OA among professors ($n = 70$), PhD candidates ($n = 56$), and those in STEM ($n = 84$). In contrast, those who reported not knowing much about OA were more often bachelor's students ($n = 42$), master's students ($n = 38$), teachers ($n = 46$), and those in social sciences ($n = 70$) or health sciences ($n = 44$).

User Awareness of OA

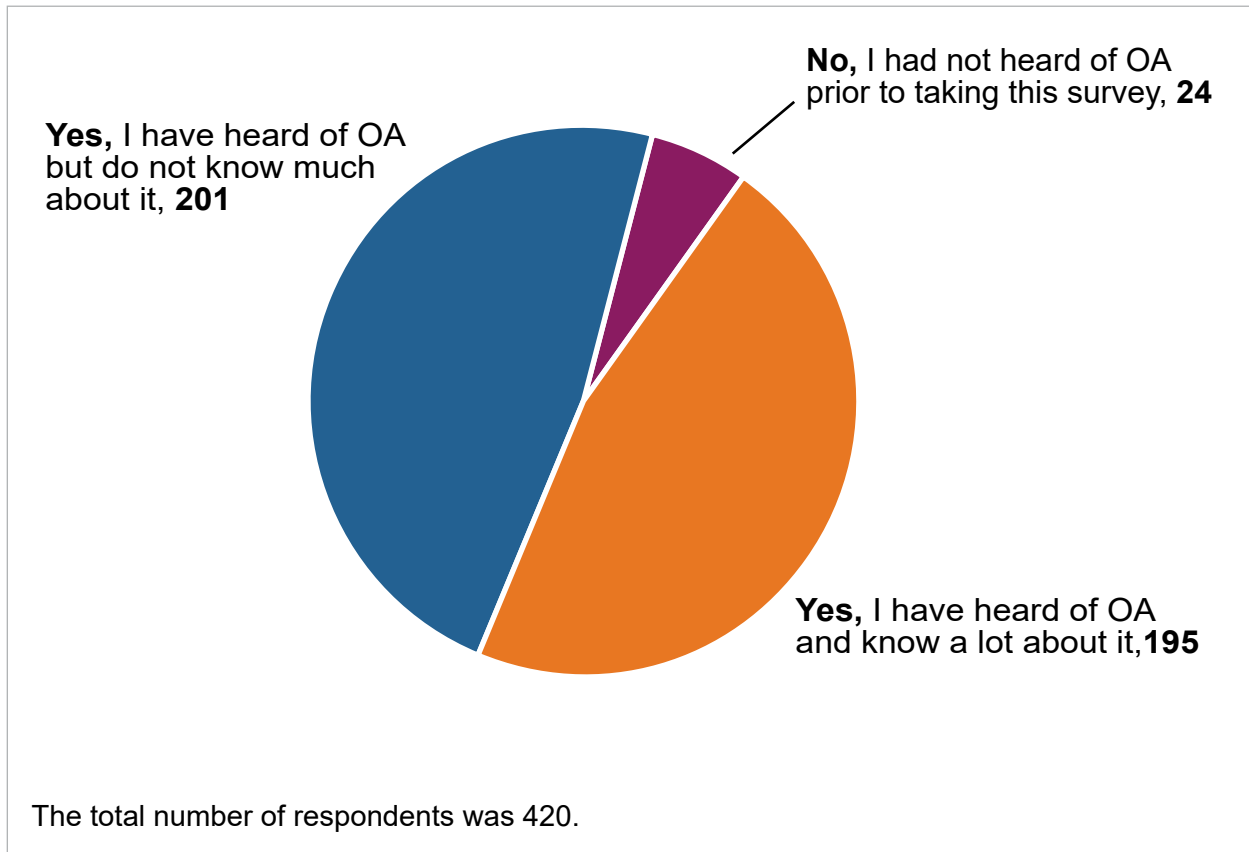


Figure 8. User awareness of OA

The slightly higher concentrations could be the result of library staff's focus on getting users to publish OA. Staff had only recently begun work to help users discover and access OA publications. Uncovering the reasons behind the differences in what users know about OA and why more don't have easier search and access experiences is likely to help libraries close these gaps.

What this means for library staff: These different areas of OA—publishing, discovery, and access—have and will continue to evolve. It will be critical for library staff to learn more about what users know about each of these areas to continue adapting outreach and instruction to improve users' experiences.

Despite many users not knowing much about OA, searching for an OA version was their most common response when they encountered a barrier to accessing the full text of scholarly, peer-reviewed publications. The three most common barriers that users encountered were directly related to the traditional paywalled access model for scholarly publications:

- Payment required ($n = 293$)
- Not available through their library ($n = 276$)
- Login required ($n = 235$)

Less than half of respondents selected other barriers such as link to download or view online does not work ($n = 141$), only physical or print item available ($n = 91$), and cannot tell how to get access ($n = 87$). Thirty-two users indicated that they do not experience barriers ($n = 32$). Users were able to select all that applied for this question, and the total number of respondents was 426.

Despite many users not knowing much about OA, searching for an OA version was their most common response when they encountered a barrier to accessing the full text of scholarly, peer-reviewed publications.

Most users reported that these barriers had some or a significant negative effect on their experience accessing materials ($n = 348$) (figure 9). The most common negative effects were related to perceived time lost when trying to search for and access the full text. Forty-three reported no negative effect, with some explaining that most publications were accessible to them.

Effect of Barriers Experienced when Accessing Full Text

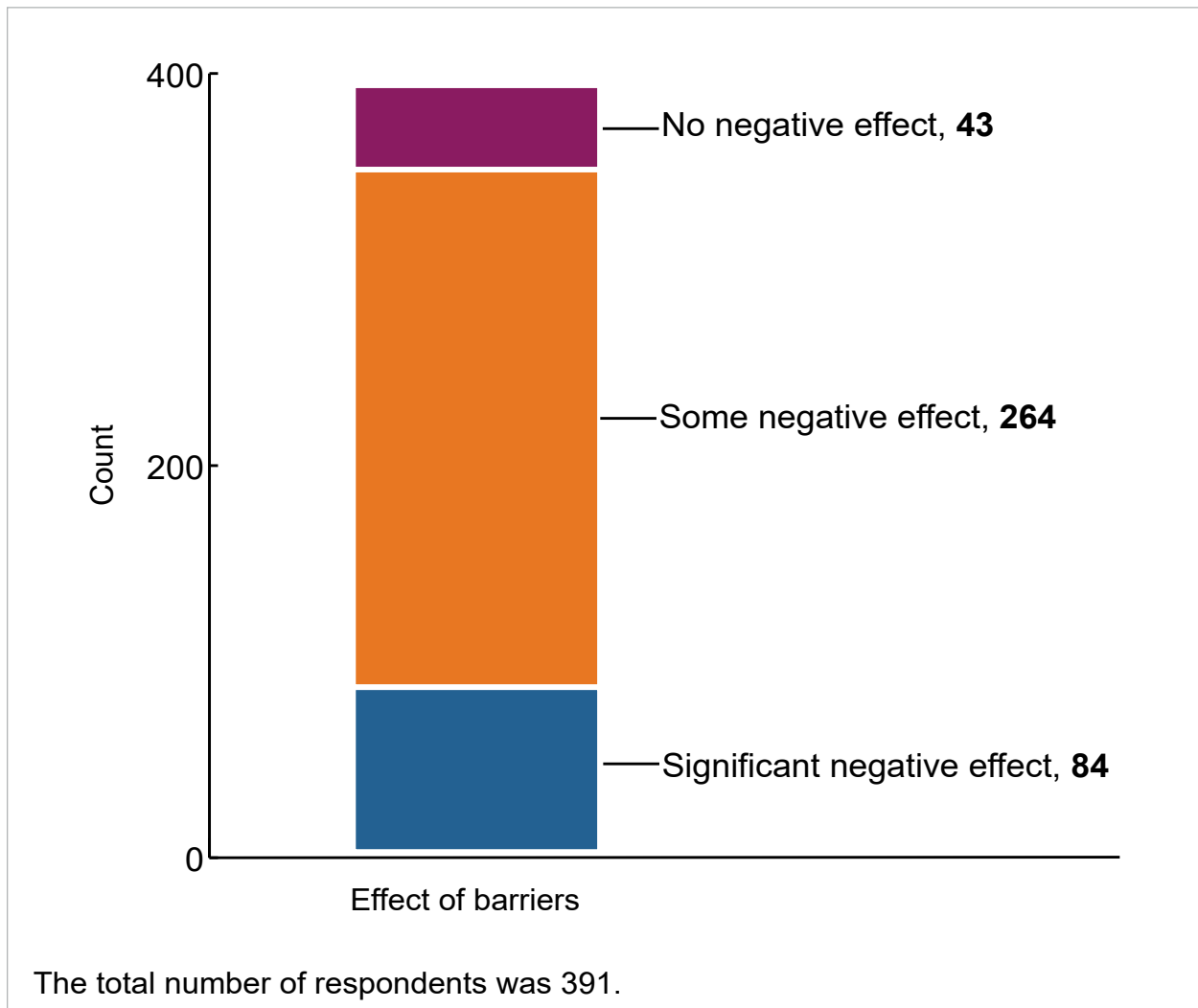


Figure 9. Effect of barriers experienced when accessing full text

Despite libraries' investment in content and systems to ensure users have seamless access to the resources they need, most users still experienced negative effects from barriers related to paywalled publications. While the top two barriers could be solved by libraries subscribing to more content and the third by more seamless user authentication, both come up against very real budget constraints. This finding suggests library staff continue efforts to promote and advocate for increased OA publication, whether through negotiating transformative agreements, depositing OA publications in the IR, or guiding authors as they navigate OA publishing options and decisions.

Looking for an open access version was the most common response to these barriers ($n = 276$), closely followed by logging in with institutional or academic credentials ($n = 270$) (figure 10). Over half of respondents also stated they would look on research sharing sites ($n = 231$).

Actions Most Likely Taken When Unable To Access Full Text

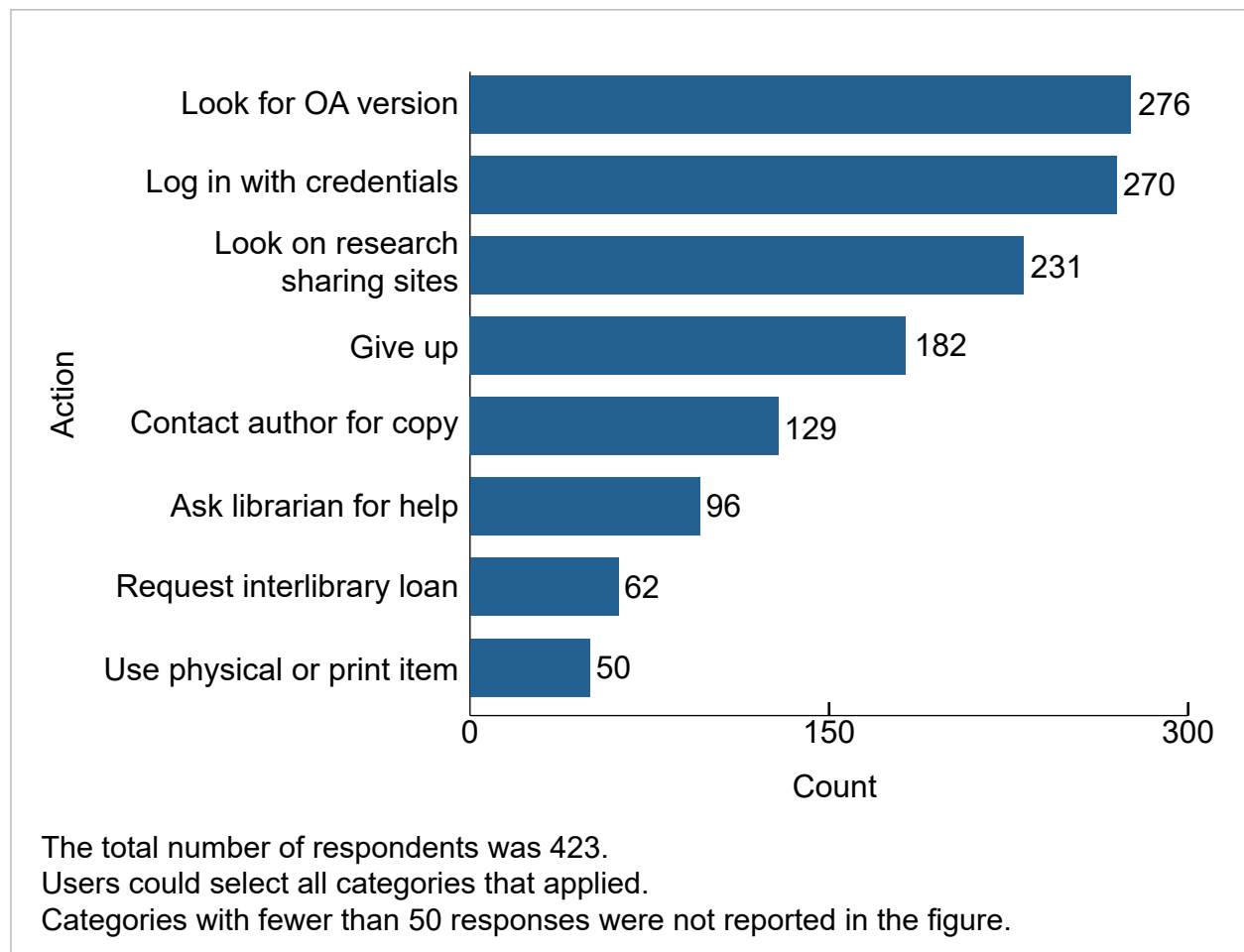


Figure 10. Actions most likely taken when unable to access full text

More users chose to give up (i.e., abandon the publication) ($n = 182$) than to contact the author for a copy ($n = 129$) or ask a librarian for help ($n = 96$). Less popular actions were to request an interlibrary loan ($n = 62$) or go to the library to use a physical or print item ($n = 50$).

The most common responses to barriers were under users' control, free to them, could be taken immediately, and did not require help from another person. Logging in as the second most common response implies that many users were searching in systems where they were not automatically recognized or signed in to have full access through their institution. The library may have already provided access, but there was an extra step that users had to take that was seen as a barrier.

This raises questions about how best to support user access and more seamlessly integrate library resources where users are searching and working. Despite the library being willing to do the work of getting access for their users when they encounter barriers, users did not commonly turn to library services (e.g., ask a librarian for help or request ILL). Users may have outdated perceptions about these services being inconvenient or slow because ILL, in particular, meets their criteria. Library staff may want to consider how to reshape user perceptions. Since the biggest negative effect of encountering barriers was lost time, library staff could promote these services as saving users time during their discovery process.

However, library staff also have to ensure that the services do, in fact, save users time by being easy to use and returning full-text publications quickly. Both free and paid OA browser extensions meet all these criteria, suggesting that they are a worthwhile option for libraries to pursue. ILL and other library services may have to be made more convenient to help users take advantage of the service.

What this means for library staff: Library services for finding full-text access after users hit a barrier need to be easier and faster to use and can be promoted as saving users both time and effort.

What this means for publishers, technology providers, and aggregators: Providing seamless authentication to content behind a paywall saves users and library staff time and effort.

Discussion

OA publications constitute a growing portion of the scholarly record. Libraries must consider how they incorporate information about OA into all the services they provide their users. This means rethinking how they talk with users about what they search for, what they access, and how they evaluate and use it. Libraries that have focused on helping authors publish OA may have to rethink

which staff in the library need to be knowledgeable about OA and how their knowledge is shared with users. For libraries just starting work in this area, there is an opportunity to have library-wide conversations and approach OA work more holistically from the beginning.

The user survey findings were helpful for evaluating library staff's current efforts around OA discovery, but they also raised additional questions. Library staff need to know more about where, how, and why their users search for, access, evaluate, and use OA publications to better inform their services. Even if OA publications can be discovered and accessed in the same systems as licensed publications, users still need education about the differences between the two so they can evaluate and use them effectively.

While the library staff in our project were pointing their users to relevant and trustworthy sources for OA publications and providing some instruction on how to access OA materials, more in-depth instruction about the nature of OA is needed. Some of the outreach techniques library staff were using, such as ILL, can be easily adapted to include this information. Users may benefit from more comprehensive instruction about how licensing and versioning work throughout the publication lifecycle, what different publishing models mean about how OA publications are created and funded, and how to determine what OA publications are trustworthy.

Improving metadata to support OA discovery

While library staff agreed that basic metadata was important for the discoverability of OA publications, they also wanted persistent identifiers, peer-review status, and license and version information. The metadata for institutionally authored OA publications was primarily created by authors and was not ideal for discovery. Library staff wanted to find ways to improve this metadata by automating deposit and harvesting metadata from other systems. However, this was a challenge because it was unclear if any system had all of the metadata that they needed. Metadata for OA publications was created, harvested, aggregated, and displayed by a variety of stakeholders in opaque and complex ways. The quality of the metadata often degraded as it was transferred between systems, further impeding discoverability. User survey results confirm the value of harvesting and aggregation to place OA publications into users' discovery workflows and the need for persistent identifiers, peer-review status, and license and version information to support users' discovery behaviors. Library staff need high-quality, authoritative metadata created with open science in mind to improve the discoverability of OA publications for their users.

Important metadata for OA discovery

Library staff at both types of institutions agreed that the metadata important for the discoverability of OA publications included the same elements important for traditional publications, such as author, title, abstract, keywords, journal, volume, issue, publication date, and subject or theme.

Library staff at both institution types also mentioned persistent identifiers that were important for discovery. Despite their belief in the importance of these metadata, library staff felt it was difficult to get sufficient identifiers for OA publications. They mentioned established identifiers (ISSN, ISBN, DOI) and more recent ones (ISNI, ORCID, ROR).

Staff mentioned needing the DOI to link to OA platforms that held information about OA status. There was also a desire to use the DOI to do a known item search more easily in a discovery system.

It would be helpful if in our discovery tool . . . it would be possible to search for the DOI. Because that's not easy. (Library systems and tool manager, U2)

Some library staff wanted to use the linking afforded by persistent identifiers to discover the semantic relationships among OA publications authored by their campus community. Other staff wanted to link OA publications to other outputs from the same research efforts, such as grants, data, and media that translated the research for a wider audience.

Maybe make more, even more linkages so not only the publication and the data set but also media appearances. So when it's in the newspaper or on the television or when there's an article in a professional journal that is linked to the peer-reviewed publication. That would make the information more open because these media appearances or professional articles they are readable for a larger audience. (Repositories and CRIS manager, U3)

These linkages allow users to understand the research more holistically, establish trust in the research process and outputs, and be able to use and reuse those resources responsibly. These linkages also helped meet individual and institutional reporting requirements that contributed to evaluation and reward systems.

Asked about peer review, version, and license information, some library staff did not view these metadata as essential for discovery because users didn't often search using them. However, other staff described them as necessary for external stakeholders who harvested OA publications. Library staff had to provide the right

version of the publication to external stakeholders. They also had to provide the license because it was an important indicator of OA status that influenced whether external stakeholders could harvest and share the metadata.

The label of the license in itself . . . doesn't do a lot or make it more discoverable. It's more the fact that it has an open license and is therefore more easily spread that makes it more discoverable. But the metadata on which license exactly is used, I don't think that is . . . an important part of the metadata. (Open access librarian, U4)

License and version metadata were also considered essential for distinguishing between OA and non-OA publications. Library staff felt systems needed better options to rank, filter, and label OA publications. They wanted to activate OA collections in their discovery systems without having to indicate that they held those publications, which they felt was misleading. However, it was the only way for OA publications to appear higher in search results. Staff also wanted OA publications to be clearly labeled, indicating they were available to download.

What this means for publishers, technology providers, and aggregators:

Consider the metadata that library staff identified as important for the discoverability of OA publications when identifying potential improvements in how metadata can be created, shared, harvested, and displayed.

Publication versions¹²

Version of record—"The version that has been published in a journal, in print and/or online. This article will include any editorial improvements such as copy editing, or typesetting, made after the peer review process is complete."

Author accepted manuscript—"The version of a research paper accepted by a journal after peer review."

Preprint—"The author's version of a research manuscript, before formal peer review, deposited on a public server."

Library staff explained how these three metadata elements could help users decide how to evaluate and use the OA publications that appeared in search results. The peer-review status of OA publications could be one factor in deciding whether the publications were authoritative enough to be trusted. The version of OA publications could help users distinguish between what appeared to be the same publication (e.g., version of record, author accepted manuscript, preprint) and influence their choice of what to use. The license for an OA publication could allow users to make informed decisions about how to use it.

What this means for publishers, technology providers, and aggregators:

Users evaluate resources concurrently and iteratively as they search and access them. Both metadata and system capabilities need to support these simultaneous processes of discovery, evaluation, and use.

Creating and exposing institutional metadata

All the institutions were creating, storing, and exposing metadata for institutionally authored OA publications using their IR and/or CRIS. Within the institution, this metadata was being used to populate individual researcher or research group webpages with the publications, in addition to being fed to the library's discovery system. Some institutions also reported sharing this metadata internally for assessment or evaluation of researchers and research groups, as well as to measure progress toward policies or goals, such as the percentage of open access published and the Sustainable Development Goals. It was also shared externally to meet funder requirements.

The metadata for these publications was created mostly by authors and research group support staff. However, library staff noted that most of this metadata was not ideal for discovery. The metadata in the records was often missing, incorrect, or not useful.

We would like them to give us as much information as possible when they register. And there's a lot of information missing most of the time.
(E-resources information specialist, UAS2)

This was true of both basic metadata, such as keywords and journal titles, as well as metadata more specific to OA publications, such as version and license information. In some cases, missing license information was not the fault of the author but rather because publisher policy did not allow licenses for green OA.

What this means for publishers: Allow authors to deposit the author accepted manuscript using an OA license. Make it clear and explicit which license(s) authors can use.

Library staff acknowledged that their processes and systems for depositing and creating metadata were not always user-friendly. Some thought the metadata quality could be improved if the system was simplified, if basic fields were required, or if the fields were better explained in the system. However, others acknowledged that specialized knowledge was needed to pick up on the nuances of metadata, particularly what metadata were important to add and how to add them.

Regardless of whether better system design could help prevent some of these quality issues, users needed to learn more about what to do and why it's important for discovery.

When the start is not good, then the output won't be good as well. So that's something that's really challenging, actually to educate them . . . and to make sure that they will fill in the right stuff, so the end will be better. . . . People just can fill in their own journal, there is no restriction for that, so they just fill in whatever they want . . . sometimes they have like 20 versions of one journal, and that makes it hard to work with. (Metadata specialist, U1)

Three of the universities were also importing metadata from citation databases, one from preprint servers, and one from an OA database to help populate their CRIS. However, none of them felt that they were getting all the metadata that was important for OA discovery from these sources. They wanted to have more input into the types of metadata that these services provided and to be able to import the entire metadata record.

I mean, if it's about discoverability of the publications, then we need proper metadata, identifiers, information about the open access status. (Repositories and CRIS manager, U4)

While these institutions were importing these records in lieu of author-created metadata, some institutions wanted to find ways to combine author processes with metadata from these sources. They wanted to be able to harvest other sources of metadata to enrich what authors provided. Library staff did not have enough time to create or edit author metadata, so they wanted to spend their limited time "finding resources that we can connect our systems to also harvest their data to enrich our own data and also share our data with others" (Library systems manager, U3). One also wondered about finding automated processes that would suggest publications to authors and, once the author confirmed, directly import the metadata record.

What this means for publishers: Partner with library staff to improve the quality of metadata for publications. This includes finding new ways of sharing and enriching metadata, as well as helping authors understand the role that quality metadata plays in the discovery of their work.

Harvesting and aggregation of OA metadata

Library staff saw harvesting and aggregation as key to increasing the visibility of OA publications. They believed that search engines, databases, national Dutch aggregators, and discovery systems put OA publications in front of users who would never discover them in the IR. However, the harvesting, aggregation,

and display of metadata across these systems was opaque and complex, in part due to the different approaches of these varied stakeholders. Library staff valued controlled metadata, the long-term preservation of content, and the full representation of the scholarly record.

Okay, but I don't know if other formats will stay safe then, but it's a big discussion right now because we're also dealing with perpetual access, of course, with journals and books, and we don't even know what 'perpetual access' really is. (Disciplinary librarian, U1)

Other stakeholders had different priorities. While all of the stakeholders had the goal of integrating OA publications into users' discovery workflows, their differing approaches and priorities had the potential to introduce tensions because they relied on one another to accomplish that goal.

One of the reasons the national aggregations of Dutch institutional metadata worked so well was that library staff collaboratively helped to define their goals and create systems that met those goals. All of the UASs used a shared repository that was built and maintained with a cooperative. Working with the cooperative, UASs had a say in the metadata they thought was important to capture for research outputs and helped develop the metadata templates, services, and repository.

Our input they use to develop the templates, the services, the repository. So, the input of the users, the institutions . . . so we tell them what we need to publish our open access research outputs ideally. So there is a collaboration [that] is working very well. It's very equal. (Repositories and CRIS specialist, UAS1)

This shared IR was harvested, and the contents were displayed on a portal dedicated to the OA research outputs of UASs. All of the university and UAS IRs were also harvested and displayed via an aggregator of all Dutch national output. Again, library staff had input into the metadata standards and interoperability requirements needed to support this aggregation, and they felt that it was overall meeting their needs and the needs of their users.

Beyond these national aggregations, there were a variety of harvesters who all had different focuses, priorities, and objectives. Some focused on outputs from all of Europe, not just the Netherlands. Some focused on specific types of OA resources, such as OA publications or OERs. Some focused on a specific discipline or subject area, such as agriculture. Others focused on different delivery mechanisms, such as discovery systems, browser extensions, or web portals. Across all of these, some harvesters were exclusively interested in OA publications and others were interested in integrating OA publications with non-OA publications. While library

staff were positive about the exposure this provided for their institutional outputs, they had little to no influence over how OA publication metadata from their institutions was harvested and used.

We are very dependent on how the portals are developed. We send our metadata to these portals through [our repository]. But we don't have any influence on how it's going to be exposed on these portals. (Repositories and CRIS specialist, UAS1)

One primary issue was the metadata fields available in different systems. Some challenges were foundational, with current metadata formats and standards not allowing or supporting important metadata elements, including persistent identifiers for linking, the CRediT taxonomy, or full-text file types. In addition, there were calls for format adaptations to support a wider variety of resource types (e.g., data, software).

Even when important metadata were in libraries' systems, they were not necessarily harvested or used by all other stakeholders.

Not all of the metadata from [our shared repository] are taken by [the search engine]. So I once had this complaint about, from one of our researchers about metadata of her publications in [the search engine]. But yeah, there's nothing I could do about this because it happens automatically. (Open access information specialist, UAS2)

Some participants also thought that some metadata was misrepresented in user interfaces, such as confusing labels for a publication's version or status as OA. The lack of reliable metadata to identify publications as OA and the inconsistency in its use across different systems was seen as a missed opportunity to make OA publications easily visible and to help keep them top of mind with users.

So we already have that open access button in our discovery, but that's only for the repository. So it's also confusing for our researchers because it's just a small set of open access. (Metadata specialist, U2)

What this means for technology providers and aggregators: Make it possible for users to consistently, easily, and immediately distinguish OA and non-OA publications, as well as different versions of publications, such as preprints, author accepted manuscripts, and versions of record.

Library staff also noted technical issues with the transfer of metadata between systems. Participants at a couple of institutions mentioned processes that weren't working correctly, including search engine indexing and API transfer into discovery systems. One institution noted that its IR was almost taken down by high-volume requests from scrapers. Library staff also pointed out the potential issues with having metadata records available in many systems but not always having a reliable copy of the OA publication. They pointed out that it was impossible to tell which version of a publication some browser extensions or search engines returned and to tell whether there was a preservation copy available if a particular publisher or system stopped operating.

Library staff believed that these issues with the metadata that stakeholders chose to harvest, aggregate, and display made OA publications less discoverable by making it harder for users to search precisely and filter results or to identify, evaluate, and decide how to use OA publications. Library staff suggested that improved metadata standards were needed to address these challenges and better support discovery in the transition to open science. Better interoperability among systems was also needed, starting with stakeholders being more transparent about how they use metadata and agreeing upon shared protocols.

What this means for publishers, technology providers, and aggregators:

Engage in conversation with library staff to improve interoperability and discovery experiences. Library staff have a valuable perspective on the interaction of technologies and processes that affect their work and their ability to meet users' needs.

User experiences and behaviors

Results from the user survey support library staff's efforts to have their institutional OA publication metadata harvested and aggregated by search engines and databases. Search engines and databases were the two most common places users searched for scholarly, peer-reviewed publications. In contrast, IRs and open access platforms were much less common choices (see figure 4).

What this means for library staff: Creating and exposing institutional metadata for search engines and databases to harvest and aggregate improves the discoverability of OA publications by placing them within users' discovery workflows.

Library staff identified several emerging types of metadata that are important to the discoverability of OA publications, including persistent identifiers, licensing and versioning information, and peer-review status. User survey results confirm that these types of metadata will be central to supporting user discovery experiences.

When asked which factors were important when searching for scholarly publications, users most commonly ranked subject relevance first, followed by the online availability of full text second, and peer review third (see table 1). This suggests that users need the systems they search in to consistently and reliably communicate whether a resource has been peer-reviewed and whether the full text, including an OA version, is available. This requires both accurate metadata and the consistent use of that metadata across systems.

When users encountered barriers to accessing scholarly, peer-reviewed publications, looking for an OA version was the most common response (see figure 10). This necessitates metadata that reliably identifies OA versions and connects them to the (potentially paywalled) version of record.

Scholarly, peer-reviewed OA publications were the most common type of OA resource that users searched for. However, users also searched for OERs, open data, digitized collections, open media, preprints, and open source software (see figure 5). To navigate the emerging open science landscape, users need to easily identify an OA resource, determine the type of OA resource, and discover relationships among OA resources. Persistent identifiers are particularly important to identify and link resources, as is metadata that captures the version of a resource or the resource type.

What this means for library staff: Improving user discovery experiences during the transition to open science requires high-quality, authoritative metadata that supports emerging resource types, aggregation approaches, and user behaviors. This metadata has to be sufficient for both people and machines to easily and reliably identify OA resource types, evaluate resources, determine their permitted use, and identify their relationships to other resources.

Discussion

By necessity, the metadata for different types of OA publications was created by different stakeholders, but very little was created by library staff. Library staff simply did not have the time or resources to do so. Instead, they looked for opportunities to improve the quality of metadata created by authors by streamlining or automating deposit. Library staff have to help users understand that high-quality metadata is created to ensure that their work can be discovered and used more broadly, not just to check a box or satisfy a policy. Staff also wanted to enrich their institutional metadata, particularly with information that authors were unlikely to provide, such as persistent identifiers and funding information, but such metadata was difficult to find. There was a real need for this type of high-quality, authoritative metadata that could support the emerging practices of open science.

The metadata has to evolve as users' needs and behaviors evolve, and systems must also evolve to keep pace. Most library systems were not built with OA in mind and have not yet adapted to all the needed metadata changes. In part, this is because the changes themselves were not coordinated but were happening in parallel as stakeholders within the environment reacted to one another. Given the complexity of the metadata harvesting and aggregation that library staff described, it was clear that no single stakeholder had a good view of everything that was occurring across the landscape. Instead, most stakeholders saw only the pieces they were responsible for and had very little visibility into the effects of their activities on other stakeholders and users' ability to discover OA publications.

Changing this will require shared technical and metadata standards and interoperable systems that support differing goals and approaches for creating and using metadata. There is a need to balance open science principles, values, and approaches with commercial needs around competition, market concerns, and profit. Open science demands transparency, communication, collaboration, and access to knowledge. To realize the value of participating in an open landscape, all the stakeholders involved in the publication, dissemination, and preservation of OA publications will have to work toward a shared understanding of each other's needs and priorities.

Measuring the effects of library efforts

Library staff did not know what effect their efforts were having on the discoverability of OA publications or pointed out that those effects were difficult to determine: "I don't have any idea if we have any clue [laughter] to know if there is any impact" (Repositories and CRIS specialist, UAS1).

In part, this was because discoverability itself is difficult to measure. Measuring discoverability required going beyond assessing the performance of digital resources and systems to identify how users searched for and accessed these publications, something some staff were unsure how to do.

Yeah. It's difficult to say [laughter] what the impact is. We do what we can to promote it. But I'm not sure. . . . I can't look into the minds of our students and our PhDs who are trying to discover content, whether they found it accidentally or on purpose through whatever ways. We try to educate them. I'm not sure whether it can be measured. (Open access librarian, U4)

One participant conducted an exercise with PhD candidates by giving them basic metadata for three OA articles and watching their search process. The candidates all had different ways of looking for the articles, and not all of them were successful.

Additionally, no metrics for discoverability itself were discussed. Instead, library staff discussed two types of proxy measures—impact metrics and usage metrics—that they used in lieu of discoverability measures. The impact metrics that library staff discussed included citation counts, altmetrics, and societal impact metrics. These metrics primarily came from citation indexes and research analytics tools. The usage metrics that library staff discussed included views, downloads, and usage metrics broadly, and some wondered about the relative merits of each.

Library staff discussed several challenges of usage metrics for OA publications. One challenge was getting a big-picture view of OA publications when the usage metrics came from several different sources, systems, and tools. When exposing metadata for institutionally authored OA publications, library staff could focus primarily on usage metrics from their own systems, including the IR, research portals, and website analytics tools.

One challenge was getting a big-picture view of OA publications when the usage metrics came from several different sources, systems, and tools.

When adding OA publications to their collections, they were typically dependent on other sources, such as publishers and aggregators. Library staff often did not have easy access to these metrics, could not reconcile metrics across different sources and systems, and were not sure that everyone was measuring the same things in the same ways. The primary thing that library staff wanted was more centralized and easily accessible usage metrics. One participant suggested that perhaps the discovery system, as a hub for discovering content across systems, was the best option. Others simply wanted easier ways to aggregate views and downloads across different systems.

The primary thing that library staff wanted was more centralized and easily accessible usage metrics.

Equally challenging was the complex nature of versioning, aggregation of, and access to OA publications. Multiple versions of the same article with different access and usage rights, including the version of record, author accepted manuscript, and preprint, were available for discovery. Users could also take various paths, such as search engines, IRs, national aggregators, or library systems, and discover these different versions or copies of the same version. In

many of these systems, library staff had no visibility into users' activity, including when users used search engines to discover OA publications or worked from home without proxy or VPN. It tries to track open-access usage. And of course, immediately you hit the question mark as to. . . Well, this open-access material, if you check it from home, for example, and most of our scholars also work a lot from home nowadays, you're not going to see it because it's open access. There's no barrier, you don't have to log in through the proxy, you don't have to use our VPN. (Repositories and CRIS manager, U1)

A few participants discussed metrics for clicked links and redirects that are a step closer to measuring discovery. Staff at one institution wanted to try tracking clicks when someone used a link in their system to access an OA publication. They also wanted to know when someone followed an outside link into their systems as a way to understand whether the effort involved in aggregation was worth it. The OA browser extensions that libraries used also offered reports about the number of users, redirects to a library's paid and OA publications, and the usage of specific publishers and journals, but none of the participants were using these metrics.

What this means for library staff: Consider what metrics are needed to assess library efforts to make OA publications more discoverable and to provide meaningful comparisons across the variety of publication types, access models, and systems where they can be discovered, accessed, and used.

Staff at two institutions questioned the rationale of trying to measure OA publication usage or discoverability.

Yeah. Why do we want it? That's also a question. Why do we want to use the statistics for open access? (E-resources information specialist, UAS4)

For one institution, this was because OA publications didn't need to be renewed, just deactivated. For another, it was because library staff believed it was inherently valuable to improve the discoverability of OA publications. Given a lack of time and resources, some participants were not sure measuring the effects of their efforts was a worthwhile place to invest time and effort.

What this means for publishers, technology providers, and aggregators: Consider how usage metrics for OA content are tracked, managed, and communicated and aim to provide useful data to libraries when possible.

Discussion

It will come as no surprise to library staff that OA isn't free. While libraries may not have to pay for the OA publications that they add to their collections, they still invest time and effort into making OA publications discoverable for their users. Given this investment, it's reasonable to want to know whether their efforts are having the desired effects. However, measuring these effects requires additional time and effort.

It's important to come to a consensus as a library about goals, priorities, and values, and to align assessment with those goals. This may mean that library staff don't bother with any metrics related to OA publications, or it may mean that library staff invest heavily in measuring the discoverability of OA publications from both system and user perspectives. What's important is that everyone within the library understands and agrees on what is being done, why it's being done, and how it fits into larger institutional goals and policies around OA. In instances where libraries are acquiring and managing resources as a consortium, it might also be beneficial to have some consortial consensus about measuring efforts. This consensus would allow the consortium to work through challenges together, including developing metrics that suit their needs.

Library staff's use of proxy measures suggests the need to develop metrics that address discoverability more directly. OA publications often exist in systems designed to provide mediated access to purchased and licensed content. In these kinds of systems, discovery could be taken for granted. As open science progresses, adapting information systems to new scholarly communication models will be essential. Metrics will need to allow meaningful comparison across this variety of publication types and access models, as well as the variety of systems where they can be discovered, accessed, and used.

Similarly, there's a need to understand how user behavior is changing in response to this changing landscape. Libraries have opportunities to do small-scale observational assessments as part of their instruction and everyday interactions with their users. Some planning and intentional effort can go a long way toward making the most of these opportunities and ensuring alignment with goals and priorities. The user survey discussed in this report is another type of user assessment that could be replicated in other contexts ([appendices 3 and 4](#)). It was useful for this study because it provided insight into where users searched for and accessed scholarly, peer-reviewed publications and how the library fits into that behavior. All of these user assessments are important measures that can help libraries and consortia identify where their efforts are having an impact and guide future activities.

CONCLUSION

Overall, the user survey results confirmed the value and direction of library staff's efforts to add OA publications to their collections, incorporate them into users' workflows, raise users' OA awareness, knowledge, and engagement, and expose institutional OA publication metadata for harvesting and aggregation. With the increase in the amount of OA being published, there is more that library staff can do to incorporate OA publications more holistically into library policy and planning, library collections, and user outreach and instruction. The transition toward open science represents an emerging area of knowledge and practice for library staff and their users but also for a broader set of commercial, governmental, and public stakeholders. Approaching this transition intentionally and proactively will go a long way toward helping everyone navigate it effectively.¹³

The transition toward open science represents an emerging area of knowledge and practice for library staff and their users but also for a broader set of commercial, governmental, and public stakeholders.

OA is multifaceted and affects stakeholders throughout the library, institution, and beyond in myriad ways. Different stakeholders engaged with OA publications at different stages in the lifecycle, from funding, publication, aggregation, and preservation to discovery, evaluation, and use, but often had little visibility into the needs and behaviors of stakeholders in other parts of the lifecycle. To facilitate the discovery of OA publications, these stakeholders will need to work together throughout this lifecycle.

Due to the nature of their work, library staff were engaged in multiple parts of the lifecycle that affected a variety of stakeholders. As UKB and SHB consortia members, library staff collaborated to develop workflows, policies, and relationships that helped them do their work more efficiently and effectively. However, this collaboration did not seem to extend as easily to other stakeholders.

Library staff wanted more coordination around OA at their institutions, including clearer policies and strategies that are communicated and implemented throughout the institution. This coordination would help library staff to contribute more effectively toward shared institutional goals and to work more seamlessly with their users. Library staff had gaps in their knowledge about how best to support user engagement with OA publications.

Library staff also wanted greater engagement and conversation with outside stakeholders such as publishers, aggregators, and technology providers. They wanted to advocate for metadata and system design that worked well both for library workflows and user needs. OA represents a significant shift in how publications are funded, created, and licensed. All stakeholders, both within and outside the institution, are figuring out where OA fits within their mission and goals.

Truly improving the discoverability of OA publications requires all of the stakeholders involved to consider the needs of others within the lifecycle.

Navigating the transition period and the multiplicity of publishing models creates strain for all stakeholders, including library staff. Truly improving the discoverability of OA publications requires all of the stakeholders involved to consider the needs of others within the lifecycle. This state of transition is the perfect moment to devise new ways to work together toward shared interests.

Library efforts to improve the discoverability of open access publications

Discoverability of scholarly, peer-reviewed open access (OA) publications

Scholarly, peer-reviewed publication—research writing that has been evaluated by a group of people with the appropriate expertise, such as journal articles, books, book chapters, conference papers, author accepted manuscripts/postprints, etc.

“A publication is defined ‘open access’ when there are no financial, legal, or technical barriers to accessing it—that is to say when anyone can read, download, copy, distribute, print, search for and search within the information, or use it in education or in any other way within the legal agreements.”¹⁴

1. How long has your library been engaged in improving the discoverability of scholarly, peer-reviewed OA publications produced within and outside of your university? (*select only one*)
 - We are making plans to begin this work.
 - We started this work less than a year ago.
 - We have been engaged in this work for 1-5 years.
 - We have been engaged in this work for more than 5 years.

Proceed to question 2.

2. Is there a policy that guides your library’s open access activities? (*select only one*)
 - There is a formal written policy. **Go to question 3.**
 - There is an informal understanding. **Skip to question 4.**
 - There is no formal policy or informal understanding. **Skip to question 5.**

3. Are you willing to share your written open access policy with us?
(*select only one*)
- Yes
 - No

Proceed to question 4.

4. What library activities are guided by the open access policy?
(*select all that apply*)
- Collection development
 - Cataloging
 - Outreach
 - Instruction
 - LibGuides
 - Reference
 - Interlibrary loan
 - Other _____

Proceed to question 5.

Your library collections

Your library collections - the resources you acquire, license, or link to that are locally held or from other organizations to meet the needs of your user community.

5. How much of your library collections would you estimate is scholarly, peer-reviewed OA publications? (*select only one*)
- None **Skip to question 7.**
 - Less than half **Go to question 6.**
 - Half **Go to question 6.**
 - Most **Go to question 6.**
 - All **Go to question 6.**

6. What types of scholarly, peer-reviewed OA publications are in your library's collections?¹⁵ (*select all that apply*)
- Diamond OA (Immediate open access publication by a journal or book publisher without payment of a processing charge.)
 - Gold OA (Immediate open access publication by a journal or book publisher usually on payment of a processing charge.)
 - Green OA (A version of the author accepted manuscript is archived online such as in a repository.)
 - Hybrid OA (Some articles in a journal or chapters in a book are made open access on payment of a processing charge.)
 - I don't know

Proceed to question 7.

Scholarly, peer-reviewed OA publications authored by your campus community

7. How has the number of scholarly, peer-reviewed OA publications authored by your campus community changed in the last three years? (*select one*)
- The number has decreased. **Go to question 8.**
 - The number has stayed the same. **Go to question 8.**
 - The number has increased. **Go to question 8.**
 - There are no scholarly, peer-reviewed OA publications authored by my campus community. **Skip to the end.**
8. Of the OA publications authored by your campus community, which type is the most common?¹⁶ (*select all that apply*)
- Diamond OA (Immediate open access publication by a journal or book publisher without payment of a processing charge.)
 - Gold OA (Immediate open access publication by a journal or book publisher usually on payment of a processing charge.)
 - Green OA (A version of the author accepted manuscript is archived online such as in a repository.)
 - Hybrid OA (Some articles in a journal or chapters in a book are made open access on payment of a processing charge.)

Proceed to question 9.

9. Which information systems at your institution are used to create metadata for the scholarly, peer-reviewed OA publications authored by your campus community? *(select all that apply)*
- Institutional repository **Go to question 10.**
 - Current research information system (CRIS) **Go to question 10.**
 - University press **Go to question 10.**
 - SURFsharekit **Go to question 10.**
 - My institution does not create metadata for scholarly, peer-reviewed OA publications. **Skip to the end.**
 - Other _____ **Go to question 10.**
10. Who at your institution is creating the metadata for the scholarly, peer-reviewed OA publications authored by your campus community? *(select all that apply)*
- Authors of the publications
 - Library staff
 - Other _____

Proceed to question 11.

11. Which information systems at your institution are used to expose the metadata your institution creates for the scholarly, peer-reviewed OA publications authored by your campus community? *(select all that apply)*
- Institutional repository
 - Current research information system (CRIS)
 - University press
 - SURFsharekit
 - My institution does not expose metadata for scholarly, peer-reviewed OA publications
 - Other _____

End

Thank you for your interest in our project.

OA Discovery group interview protocol

Scholarly, peer-reviewed publication—research writing that has been evaluated by a group of people with the appropriate expertise, such as journal articles, books, book chapters, conference papers, author accepted manuscripts/postprints, etc.

“A publication is defined ‘open access’ when there are no financial, legal, or technical barriers to accessing it—that is to say when anyone can read, download, copy, distribute, print, search for and search within the information, or use it in education or in any other way within the legal agreements.”¹⁷

Exposing metadata for the OA publications produced at your university

1. What service providers reuse the metadata created for the scholarly, peer-reviewed OA publications authored by your campus community?
2. Which units within the library and university reuse the metadata created for the scholarly, peer-reviewed OA publications authored by your campus community?
3. How do you decide what metadata elements to include for your stakeholders to use?
 - a. To what extent are your decisions influenced by input from your stakeholders on the quality and completeness of the metadata?
 - b. Which metadata elements are particularly important for the discoverability of OA publications?
4. What metadata formats do you make available for your stakeholders?
5. What services are the stakeholders providing to you in return?
6. How is exposing metadata impacting the discoverability of the scholarly, peer-reviewed OA publications authored by your campus community?
 - a. How are you measuring impact?

7. What changes would you like to make when exposing metadata for scholarly, peer-reviewed OA publications to increase their discoverability?
 - a. What would make your processes and procedures with both internal and external stakeholders more effective? What about more efficient?
 - b. What challenges need to be addressed?

Selecting and adding scholarly, peer-reviewed OA publications to your library collections

8. How do you select these publications to include in your library collections?
 - a. From the survey we learned [collection development is/is not guided] by [a formal/an informal open access policy]. How does the policy influence the ways that you select OA publications?
9. How do you make these publications discoverable in your library collections?
 - a. What about reusing metadata from the IR, CRIS, and/or university press?
 - b. What about using a third-party knowledge base to add fully open journal/book titles, hybrid journal/book titles, or OA collections?
 - c. What about cataloging OA publications separately?
 - d. From the survey we learned [cataloging is/is not guided] by [a formal/an informal open access policy]. How does the policy influence the ways that you make OA publications discoverable in your library collections?
10. What impact is selecting and adding OA publications to your collections having on their discoverability? How are you measuring impact?
11. What changes would you like to make when selecting and adding scholarly, peer-reviewed OA publications to your library collections to increase their discoverability?
 - a. What would make these processes/procedures more effective? What about more efficient?
 - b. What challenges need to be addressed?

Helping your campus community discover scholarly, peer-reviewed OA publications

12. In what other ways do you help your campus community discover OA publications, besides selecting and including them in your collection?
 - a. What role do browser extensions play?
 - b. From the survey we learned [library activities selected from the survey] were guided by [a formal/an informal open access policy]. How does the policy influence the ways you help your campus community discover OA publications?
13. What impact is the help being provided having on the discoverability of scholarly, peer-reviewed OA publications? How are you measuring impact?
14. What changes would you like to make to the help you are providing to increase your campus community's discoverability of scholarly, peer-reviewed OA publications?
 - a. What would make the help you provide more effective? What about more efficient?
 - b. What challenges need to be addressed?

Improving discoverability in collaboration with others

15. Given today's discussions, in what ways do you see yourselves working together to improve the discoverability of scholarly, peer-reviewed OA publications?
16. In what ways do you see yourselves working with other stakeholders at your university to improve the discoverability of scholarly, peer-reviewed OA publications?
17. In what ways do you see yourself working with external stakeholders to improve the discoverability of scholarly, peer-reviewed OA publications?
18. What else would you like to be doing to improve the discoverability of scholarly, peer-reviewed OA publications?

Closing

19. Is there anything more you'd like to tell us?
20. Do you have any questions for us?

Experiences with scholarly, peer-reviewed publications and open access

Thank you for taking this survey about your experience searching for scholarly, peer-reviewed publications. You will also be asked about barriers you encounter during access and your experience with open access.

A scholarly, peer-reviewed publication is research writing that has been evaluated by a group of experts. Some examples include journal articles, books, book chapters, conference papers, and postprints (authors' manuscripts that have been peer-reviewed and accepted but not prepared for publication).

"Open access (OA) means free access to information and unrestricted use of electronic resources for everyone. Any kind of digital content can be OA, from texts and data to software, audio, video, and multi-media."¹⁸

This survey is your chance to provide information to libraries at universities and universities of applied sciences in the Netherlands that helps them improve search and access experiences. Your participation in this survey is voluntary and will take approximately 10 minutes. Summarized survey results will be published open access.

Demographics

1. Please list all universities and/or universities of applied sciences you are associated with. ***Required**
 - University, please specify _____
 - University of applied sciences, please specify _____
2. Select your roles. (*select all that apply*) ***Required**
 - Full Professor
 - Associate Professor
 - Assistant Professor
 - Teacher
 - Researcher
 - PhD student/PhD candidate
 - Master's student
 - Bachelor's student

- Associate's degree student
 - Prefer not to answer
3. Select the scholarly areas you are affiliated with.
(select all that apply) ***Required**
- Science, Technology, Engineering, Math (STEM)
 - Social sciences
 - Arts, Humanities
 - Business
 - Law, Legal studies
 - Health sciences, Medicine
 - Other, please specify _____
 - Prefer not to answer

Searching for scholarly, peer-reviewed publications

4. Within the last six months, how frequently did you search for or use scholarly, peer-reviewed publications? (select only one)
- Daily
 - Weekly
 - Monthly
 - Less than monthly
 - Never
5. Where do you normally go to search for scholarly, peer-reviewed publications? (select all that apply)
- Database (such as Scopus, Web of Science, PubMed, Nexis Uni, JSTOR)
 - Institutional repository or portal at an academic institution
 - Library search page or catalog
 - Open Access platform (such as DOAJ, DOAB, HBO Kennisbank, CORE, OpenAIRE)
 - Publishers' website (such as Taylor & Francis, SpringerLink, Oxford University Press)
 - Research sharing site (such as ResearchGate, Sci-Hub, Academia.edu, Library Genesis)
 - Search engine (such as Google, Google Scholar, DuckDuckGo, Bing)

- Social networking site (such as Twitter, LinkedIn)
- WorldCat.org
- Other, please specify _____
- I do not specifically search for scholarly, peer-reviewed publications
(Skip to question 7)

6. What is most important to you when you search for scholarly publications?¹⁹
Rank from 1 (most important) to 9 (least important)

- The subject is relevant
- The full text is available online
- I can understand the content
- It was published recently
- It has been peer reviewed
- The author's reputation
- The journal or publisher's reputation
- The physical or print item is available
- The publication is open access

Barriers to accessing scholarly, peer-reviewed publications

7. What barriers do you experience accessing the full text of scholarly, peer-reviewed publications? (*select all that apply*)

- I cannot tell how to get access
- Link to download or view online does not work
- Login required
- Only physical or print item available (no online version)
- Payment required
- Not available through the library
- Other, please specify _____
- I do not experience barriers accessing the full text of scholarly, peer-reviewed publications **(Skip to question 9)**

8. What effect do the barriers you experience accessing the full text of scholarly, peer-reviewed publications have on your work? (*select only one*)
- Significant negative effect
 - Some negative effect
 - No negative effect

Please describe the reason for your choice _____

9. What actions are you most likely to take when you are not able to access the full text of scholarly, peer-reviewed publications? (*select all that apply*)
- I ask a librarian for help
 - I buy the publication
 - I contact the author to request a copy of the publication
 - I go to the library to use a physical or print item
 - I log in with my institution/academic credentials
 - I look for an open access version
 - I look on social networking sites (such as Twitter, LinkedIn)
 - I look on research sharing sites (such as ResearchGate, Sci-Hub, Academia.edu, Library Genesis)
 - I request an interlibrary loan
 - I give up
 - Other, please specify _____

Open access

10. Prior to taking this survey, had you heard of open access (OA)? (*select only one*)
- I have heard of OA and know a lot about it
 - I have heard of OA but do not know much about it
 - I had not heard of OA prior to taking this survey
11. What types of open access resources do you search for? (*select all that apply*)
- Digitized collections (such as historical newspapers, books, photographs, archival materials)
 - Open data

- Open educational resources
 - Open media (such as audio, video, images)
 - Open-source software
 - Preprints (research writing that has not been peer reviewed or prepared for publication)
 - Scholarly, peer-reviewed OA publications
 - Other, please specify _____
 - I do not specifically search for open access resources
12. How would you describe your experience searching for scholarly, peer-reviewed OA publications? (*select only one*)
- Very easy
 - Somewhat easy
 - Somewhat difficult
 - Very difficult
 - This is not applicable to me
13. How would you describe your experience accessing the full text of scholarly, peer-reviewed OA publications? (*select only one*)
- Very easy
 - Somewhat easy
 - Somewhat difficult
 - Very difficult
 - This is not applicable to me
14. What browser extensions do you use to access the full text of scholarly, peer-reviewed OA publications? (*select all that apply*)
- EndNote Click (formerly Kopernio)
 - Lean Library
 - LibKey Nomad
 - Open Access Button
 - Unpaywall
 - Other, please specify _____
 - I do not use browser extensions to access the full text of scholarly, peer-reviewed OA publications

Ervaringen met wetenschappelijke, peer-reviewed publicaties en Open Access

Hartelijk dank voor het invullen van deze enquête over uw ervaring met het zoeken naar wetenschappelijke, peer-reviewed publicaties. U zult ook gevraagd worden naar belemmeringen die u ondervindt bij het verkrijgen van toegang tot deze publicaties, en uw ervaring met open access.

Een wetenschappelijke peer-reviewed publicatie is een wetenschappelijke tekst die is beoordeeld door een groep van experts. Enkele voorbeelden zijn tijdschriftartikelen, boeken, hoofdstukken uit boeken, conferentiepapers en postprints (manuscripten die door vakgenoten zijn beoordeeld en geaccepteerd, maar niet opgemaakt voor publicatie).

“Open Access (OA) betekent gratis toegang tot informatie en onbeperkt gebruik van elektronische bronnen voor iedereen. Elke vorm van digitale inhoud kan OA zijn, van teksten en gegevens tot software, audio, video en multimedia.”²⁰

Deze enquête is uw kans om bibliotheken van universiteiten en hogescholen in Nederland informatie te verstrekken die hen helpt de ervaring (van gebruikers) met zoeken en vinden te verbeteren. Uw deelname aan dit onderzoek is vrijwillig en duurt ongeveer 10 minuten. De samengevatte onderzoeksresultaten zullen open access gepubliceerd worden.

Demografische vragen

1. Vermeld alstublieft alle universiteiten en/of hogescholen waaraan u verbonden bent. ***Verplicht**
 - Universiteit, specificeer _____
 - Hogeschool, specificeer _____
2. Selecteer de rollen die u vervult. ***Verplicht**
 - Hoogleraar/Lector
 - Universitair hoofddocent
 - Universitair docent
 - Docent
 - Onderzoeker

- PhD-student/PhD-candidate
 - Master student
 - Bachelor student
 - Associate-degree student
 - Ik geef liever geen antwoord
3. Selecteer de wetenschapsgebieden waaraan u verbonden bent. ***Verplicht**
- Exacte wetenschap, technologie, ontwerp en toegepaste wiskunde (STEM-wetenschappen)
 - Sociale wetenschappen
 - Kunst- en Geesteswetenschappen
 - Economie en Bedrijfswetenschappen
 - Rechtswetenschappen
 - Geneeskunde, Gezondheidswetenschappen/Gezondheidszorg
 - Anders, namelijk (specificeer) _____
 - Ik geef liever geen antwoord

Zoeken naar wetenschappelijke peer-reviewed publicaties

4. Hoe vaak heeft u in de afgelopen zes maanden gezocht naar of gebruik gemaakt van wetenschappelijke, peer-reviewed publicaties? *(selecteer één optie)*
- Dagelijks
 - Wekelijks
 - Maandelijks
 - Minder vaak dan maandelijks
 - Nooit
5. Waar zoekt u gewoonlijk naar wetenschappelijke, peer-reviewed publicaties? *(selecteer alle opties die van toepassing zijn)*
- Database (zoals Scopus, Web of Science, PubMed, Nexis Uni, JSTOR)
 - Institutionele repository of portal van een onderzoeksinstituting
 - Bibliotheek zoekpagina of catalogus

- Open Access platform (zoals DOAJ, DOAB, HBO Kennisbank, CORE, OpenAIRE)
- Website van een uitgever (zoals Taylor & Francis, SpringerLink, Oxford University Press)
- Platform voor het delen van wetenschappelijke publicaties (zoals ResearchGate, Sci-Hub, Academia.edu, Library Genesis)
- Zoekmachine (zoals Google, Google Scholar, DuckDuckGo, Bing)
- Social media platform (zoals Twitter, LinkedIn)
- WorldCat.org
- Anders, namelijk (specificeer) _____
- Ik zoek niet specifiek naar wetenschappelijke, peer-reviewed publicaties
(Ga verder met vraag 7)

6. Wat is voor u het belangrijkste wanneer u zoekt naar wetenschappelijke publicaties?²¹

Geef de volgorde aan van belangrijkste (1) naar minst belangrijk (9)

- Het onderwerp is relevant
- De volledige tekst is online toegankelijk
- Ik kan de inhoud begrijpen
- Het is recentelijk gepubliceerd
- Het is peer reviewed
- De reputatie van de auteur
- De reputatie van het tijdschrift of de uitgever
- De publicatie is in papieren vorm beschikbaar
- De publicatie is open access

Belemmeringen bij het verkrijgen van toegang tot de wetenschappelijke, peer-reviewed publicaties

7. Welke belemmeringen ervaart u bij het verkrijgen van toegang tot de volledige tekst van wetenschappelijke, peer-reviewed publicaties?

(selecteer alle opties die van toepassing zijn)

- Weet niet hoe ik toegang kan krijgen
- De link voor het downloaden of online raadplegen werkt niet
- Login is vereist
- Slechts de papieren publicatie is beschikbaar (geen online versie)

- Betaling is vereist
- Het is niet beschikbaar via de bibliotheek
- Anders, namelijk (specificeer) _____
- Ik ervaar geen belemmeringen om toegang te krijgen tot de volledige tekst van wetenschappelijke, peer-reviewed publicaties
(Ga verder met vraag 9)

8. Welk effect hebben de belemmeringen die u ervaart om toegang te krijgen tot de volledige tekst van wetenschappelijke, peer-reviewed publicaties op uw werkzaamheden? (*selecteer één optie*)
- Significant negatief effect
 - Enig negatief effect
 - Geen negatief effect

Geef de reden van uw keuze: _____

9. Wanneer u geen toegang krijgt tot de volledige tekst van een wetenschappelijke, peer-reviewed publicatie, wat doet u dan? (*selecteer alle opties die van toepassing zijn*)
- Ik vraag een bibliotheekmedewerker voor hulp
 - Ik schaf de publicatie aan
 - Ik neem contact op met de auteur en vraag om een kopie van de publicatie
 - Ik ga naar de bibliotheek om de papieren versie te gebruiken
 - Ik log in met mijn (institutionele) inlog-gegevens
 - Ik ga op zoek naar een open access versie
 - Ik ga rondvragen op social media platforms (zoal Twitter, LinkedIn)
 - Ik ga zoeken op platforms waar wetenschappelijke publicaties gedeeld worden (zoals ResearchGate, Sci-Hub, Academia.edu, Library Genesis)
 - Ik dien een IBL-aanvraag aan
 - Ik geef het op
 - Anders, namelijk (specificeer) _____

Open access

10. Voordat u deze enquête invulde, had u al gehoord van open access (OA)?
(selecteer één optie)
- Ik heb gehoord van OA en weet er veel van af
 - Ik heb gehoord van OA maar weet er niet veel van af
 - Ik had niet gehoord van OA voordat ik deze enquête invulde
11. Naar welke soorten open access bronnen zoekt u?
(selecteer alle opties die van toepassing zijn)
- Gedigitaliseerde collecties (zoals historische kranten, boeken, foto's, archiefmateriaal)
 - Open data
 - Open leermaterialen
 - Open media (zoals audio, video, beeldmateriaal)
 - Open-source software
 - Preprints (wetenschappelijke tekst dat geen peer review ondergaan heeft en niet opgemaakt is voor publicatie)
 - Wetenschappelijke, peer-reviewed OA-publicaties
 - Anders, namelijk (specificeer) _____
 - Ik zoek niet specifiek naar open access bronnen
12. Hoe zou u uw ervaring met het zoeken naar wetenschappelijke, peer-reviewed OA-publicaties omschrijven? (selecteer één optie)
- Het gaat mij heel gemakkelijk af
 - Het gaat mij enigszins gemakkelijk af
 - Het gaat mij enigszins moeilijk af
 - Het gaat mij heel moeilijk af
 - Dit is niet van toepassing op mij
13. Hoe zou u uw ervaring met het verkrijgen van toegang tot wetenschappelijk, peer-reviewed OA-publicaties omschrijven?
(selecteer één optie)
- Het gaat mij heel gemakkelijk af
 - Het gaat mij enigszins gemakkelijk af
 - Het gaat mij enigszins moeilijk af

- Het gaat mij heel moeilijk af
- Dit is niet van toepassing op mij

14. Welke browserextensies gebruikt u om toegang te krijgen tot wetenschappelijke, peer-reviewed publicaties?
(selecteer alle opties die van toepassing zijn)

- EndNote Click (voorheen Kopernio)
- Lean Library
- LibKey Nomad
- Open Access Button
- Unpaywall
- Anders, namelijk (specificeer) _____
- Ik gebruik geen browserextensies om toegang te verkrijgen tot wetenschappelijke, peer-reviewed OA-publicaties

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NOTES

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- 10 In two cases, respondents did not provide the name of the university or university of applied sciences they are affiliated with. These two cases were kept because the respondents provided responses to other questions.
- 11 Barnes, Lucy. 2018. “Green, Gold, Diamond, Black – What Does It All Mean?” *Open Book Publishers Blog*, 22 October 2018. <https://doi.org/10.11647/obp.0173.0089>.

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- 19 Answers were randomized for each respondent.
- 20 UNESCO, "Open Access," (see n. 18).
- 21 Antwoorden waren voor elke respondent gerandomiseerd.

An aerial photograph of a lush green landscape. A wide, straight road runs horizontally across the middle. To the right, a river or canal winds through the fields. In the lower right, there is a small building and a circular structure, possibly a well or a small pond. The overall scene is vibrant and rural.

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