

Who are the users of national open access journals? The case of the Finnish Journal.fi platform

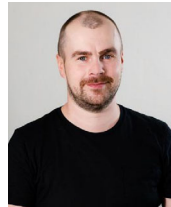
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Abstract

In this paper we study the diversity of users of open access articles on the Finnish Journal.fi platform. This platform hosts around hundred open access journals from Finland publishing in different fields and mainly Finnish and English languages. The study is based on an online survey, conducted on 48 journals during Spring 2020, in which visitors were asked to indicate their background and allow their location and download behaviour be tracked. Among 668 survey participants, the two largest groups were students (40%) and researchers (36%), followed by private citizens (8%), other experts (7%) and teachers (5%). Other identified user categories include journalists, civil servants, entrepreneurs and politicians. While new publications attract a considerable share of the views, there is still a relatively large interest, especially among students, in older materials. Our findings indicate that Finnish language publications are particularly important for reaching students, citizens, experts and politicians. Thus, open access to publications in national languages is vital for the local relevance and outreach of research.

Keywords: Scholarly publishing, Open access, Altmetrics

INTRODUCTION

During the past few decades, Responsible Research and Innovation (RRI) and Open science policies have underscored the importance of societal impact of research (Gerber et al., 2020; Novitzky et al., 2020). National journals published in languages other than English are thought to serve the diverse information

needs of society, however their contribution to the impact of research remains a blind-spot.

In Finland, the landscape of scholarly publishing has developed since the early 19th century (Lilja, 2012). At least since the mid-1990's, Finnish journals have seen their role in scholarly communication narrowed, as Finnish researchers have increasingly published their results in foreign outlets and in English

(Mathies et al., 2020; Pölönen et al., 2018). In 2016–2017, 8% of the Finnish universities' entire output of peer-reviewed journal articles was published in national journals (Pölönen et al., 2020).

The share of English language publications is currently increasing in many European countries, especially in the social sciences and humanities (SSH) (Kulczycki et al., 2018). In non-Anglophone countries, policy-makers, evaluators and also researchers may question the value of publishing in languages other than English. Consequently, national journal publishers—in Finland mostly learned societies and research institutions—need increasingly to argue for their importance to research and society in order to motivate high-quality submissions from authors, and to legitimize funding of their publishing operations and transition to open access (Late et al., 2020). Indeed, both multilingualism and open access are claimed to facilitate the dissemination of research knowledge beyond academia to support, for example, teaching, learning, enlightenment, critical debate, professional practice, innovation, and decision-making (Elsabry, 2017; Sivertsen, 2018; Zuccala, 2009). Yet, evidence of societal impact of national journals and open access remains relatively weak.

Traditionally, the impact of research has been measured by counting articles and citations in international journals indexed in Web of Science Core Collection and Scopus databases, in which publications in languages other than English are almost invisible. According to Kulczycki et al. (2020), these commercial databases covered only 3%–8% of almost 94,000 peer-reviewed journal articles published in the local languages of seven European countries by more than 50,000 SSH researchers in 2013–2015. In any case, citation analysis provides only a partial picture of research impact because not all publications and citations from research literature are counted, researchers do not cite all research they read, and not all readers are researchers (Mohammadi et al., 2015; Nicholas et al., 2005). Similarly it is important to note that downloading, reading and use are not the same thing. A publication might be downloaded but never read, or it might be scanned, for example for locating a reference to another paper, but never actually read. Moreover, reading might connote anything from briefly scanning the abstract, to selective or more in-depth reading of the text. Thus, here we mainly study 'use' in terms of a request for a particular source, rather than actual reading (cf. Kurtz & Bollen, 2010).

A new suite of methods and data, altmetrics, are developed for capturing the wider outreach of research and the different types of users of research publications (Wouters & Costas, 2012). Nevertheless, the most promising altmetrics sources for readership or user profiles, such as Mendeley, mainly cover research published in English language journals (Hammarfelt, 2014; Mohammadi et al., 2015). Readership metrics—or rather usage metrics—have been proposed in addition to metrics that are based on interactions in social media, as an alternative method for assessing the uptake of academic publications (Duy & Vaughan, 2006; Haustein, 2014). Studies in the use of online resources have focused on a range of aspects, for example the age of sources used (Nicholas et al., 2005), disciplinary differences in uptake of online materials (Talja et al., 2007) and usage

Key points

- Students (40%) and researchers (36%) are the largest user groups of articles at Journal.fi platform, while those outside academia make up 24% of 668 users participating in the study.
- While 46% of users of English language articles are researchers, their share of national language (Finnish and Swedish) articles is only 25%.
- Students made greater use of the national language articles and older articles on Journal.fi than other user groups—the opposite of researcher users.
- The vast majority, 97%, of all visits to national language articles originate from Finland, while 63% of visits to articles in foreign languages—mainly English—come from foreign locations.

depending on age of publication. A recent study on reading practices in Finnish academia points to PhD students and professors as the most frequent users of journal articles, and the articles were almost always accessed electronically (with the exception of humanities scholars who still read printed journals). Moreover, scholars were mainly interested in recent publications, and this was especially noticeable in the case of journal articles (Late et al., 2019).

Studies concerning various aspects of open access journals are quite common, yet the focus has primarily been directed towards English language journals. Open access journal platforms, such as the *Érudit* platform for the French-language journals (Cameron-Pesant, 2019), or the Croatian open access platform HRČAK (Stojanovski et al., 2009) offers the possibility to analyse the use of open access journals, which are published in languages other than English. Such studies are important as publication in local languages are likely to attract other types of audiences compared to those in English.

In the literature we often find a division between publications directed mainly to an audience of fellow researchers, and those which aim for broader public dissemination. In a discussion on the audiences of humanities research, Nederhof (2006), divides the audience into three groups: international scholars, researchers on the national or regional level and a non-scholarly audience. This division, we argue, may be applied more broadly in order to understand the different users of open access journals in national languages. Yet, we should be careful to view these categories as mutually exclusive—researchers may be active both internationally and nationally—and a fourth, and significant group of 'scholarly' users, students, could be added. Further divisions are obviously possible, and one important audience to consider is professionals—teachers, doctors, lawyers etc.—for whom access to academic publications are of great importance in their work.

RESEARCH QUESTIONS, DATA AND METHODS

In this study, we set out specifically to investigate the outreach of research published in the Finnish journals hosted on the Journal.fi platform. The Federation of Finnish Learned Societies established this platform in January 2017 to support the open access publishing of learned societies in Finland. In 2020, Journal.fi platform hosted 98 journals, of which 85% provide immediate open access and 15% have an embargo period. These journals publish in a variety of languages, however the national languages—Finnish and Swedish—and English are most common. The journals represent all scientific fields, however we estimate that the vast majority (around 85%) specialize in the social sciences and humanities. Almost all journals on the Journal.fi platform are peer-reviewed. As of 17 November 2020, Journal.fi platform had a total of 47,970 articles published between 1883 and 2020 (including also material published before the establishment of the platform in 2017). Roughly 77% of all articles are in Finnish, 19% in English, 3% in Swedish and only 1% are in other languages.

Our main research questions are:

1. Who are the users of articles published on Journal.fi platform? In what role are they accessing articles from journal.fi platform and what is their geographical distribution?
2. Which kinds of publications are the different groups of users interested in? Do their interests differ according to the year and language of publication?

To study these questions, the Federation of Finnish Learned Societies planned an open online survey to visitors of article abstracts and full-texts on the Journal.fi platform. The editors of all journals on the Journal.fi platform were asked if they want to participate in the survey study, and 48 journals (50% of all journals) agreed. The survey was active from 7 February until 31 March 2020 (54 days). It was organized by using a plugin created for the Open Journal Systems platform. The plugin was enabled in all 48 participating journals. Each visitor of articles from these journals was presented in a pop-up window an invitation to join the survey. To participate in the survey, the visitors had to (1) indicate one role in which they read or search Journal.fi articles, and (2) permit tracking cookies.

Visitors who wished to participate in the survey had to choose one role from the following list of choices offered in Finnish, Swedish and English language: Student, Researcher, Private citizen, Other expert, Teacher, Journalist, Civil servant, Entrepreneur and Politician. No definition of roles was provided. Teachers, for example, can include anyone identifying themselves as a teacher in different contexts, such as higher or elementary education. The tracking cookies stored data about the articles and abstracts published in the 48 journals, which the participants visited during the survey. Each visitor who indicated their role and permitted tracking cookies was identified with a unique hash key.

The analysis of survey results is conducted using the basic categories of users, articles and visits:

- *Users*: number of participants identified with unique hash key.
- *Articles*: number of unique articles visited by users. Results are limited to articles published in 48 journals participating in the survey study. Article is counted as visited if at least one participant user visited the article's abstract or full-text.
- *Visits*: number of articles visited by all participating users counted together. We counted only one visit per user per article, so multiple visits to the same article, or to both abstract and full-text, by a single user are excluded.

The visitors' IP address was used to determine a geolocation. In the analysis, we group users to three categories: (1) Finland, (2) Nordic countries (including Denmark, Iceland, Norway and Sweden), and (3) other foreign locations. In addition, information about the year and language of publication of articles was gathered from the Journal.fi platform. To analyse the age of articles, we divided them into six groups according to the year of publication: 1881–1999, 2000–2009, 2010–2014, 2015–2016, 2017–2018 and 2019–2020.

As regards languages, we distinguish two broad categories: (1) national languages (Finnish and Swedish), and (2) foreign languages (mainly English). The population of speakers, the political, administrative and cultural status, as well as the role in scholarly communication of languages differ between regions and countries. In studies concerning publication languages, a distinction is often made between English and other languages. Also languages having a formal status as official and/or national languages in certain countries can be regarded as a special group of 'local' languages (Kulczycki et al., 2018, 2020). According to the Constitution of Finland, 'the national languages of Finland are Finnish and Swedish'. Finnish is the language of 87% of the population, while Swedish—the main administrative language until the late 19th century—is the first language of 5%. In the case of Journal.fi platform, the number of articles in languages other than Finnish, Swedish and English is very small. Therefore, all foreign languages are grouped as one category.

While the novel mixed-method approach allows us to scope the diverse groups of users of the research articles published in a subset of 48 journals available on the Journal.fi platform, it also has clear limitations. The unique hash key is created and stored in the user's browser, so different users coming from the same IP address are separated as long as they use their own devices. However, if one user accepts the survey and other users happen to visit Journal.fi platform from the same device, and the cookie was not deleted, more than one person is counted as one user (one hash key). If a user changes the device or deletes cookies and accepts the survey again, she will be counted as two separate users (two hash keys). Some participants may have accessed Journal.fi from more than one country. The period of time, during which the tracking cookies stored information on the visited articles, varies between participants (ranging from 54 days to 1 day). All this may result in a certain degree of inaccuracy in the counting of the actual number of users, visits and geolocations. Also

the self-selection of participants to an online questionnaire targeted at platform users may lead to underrepresentation of certain groups that may be less willing than others to participate in the study. Despite these limitations, the survey provides new and valid information on the range of users as well as the language and age of articles they visited.

RESULTS

Role of users

Total of 668 users participated in the survey (Table 1). Survey participants were asked to indicate the role in which they searched or used the research accessible at Journal.fi. platform. The two largest groups were students (40%) and researchers (36%), followed by private citizens (8%), other experts (7%) and teachers (5%). Other identified user roles include journalists, entrepreneurs, civil servants and politicians.

Geographical origin of users

The country of origin of the participants was identified based on the IP-address. In all, 68 countries were identified as places from which Journal.fi was accessed by the participants. Besides Finland (371 users), the 10 most frequently represented countries were United Kingdom (34), United States (29), Sweden (25), Germany (13), Estonia (12), Netherlands (11), India (10), Indonesia (10), Italy (8) and Japan (8).

As shown in Fig. 1, the majority of participants, 56%, came from Finland. Foreign users amounted to nearly a half of the survey participants, 5% coming from the Nordic countries (Sweden, Denmark, Norway and Iceland) and 39% from the rest of the world. Visitors from the Nordic countries amount to 11% of all users from the foreign geolocations, which is also far above their share of world population (less than 0.3%).

TABLE 1 Survey participants according to role and country.

User role	Finland	Nordic	Other	Unknown	Total	Share
Student	150	10	105	1	266	39.8%
Researcher	106	14	119	1	240	35.9%
Private citizen	39	2	11	0	52	7.8%
Other expert	40	2	5	2	49	7.3%
Teacher	20	3	12	0	35	5.2%
Journalist	5	0	3	1	9	1.3%
Entrepreneur	5	0	3	0	8	1.2%
Civil servant	5	0	2	0	7	1.0%
Politician	1	1	0	0	2	0.3%
All users	371	32	260	5	668	100%

Geographical origin by user role

Participants in all user roles come from both Finland and foreign geolocations (Fig. 1). Some categories of users, such as private citizens and experts, come predominantly from Finland. Only in the case of researchers the share of participants from foreign locations is larger (56%) than the share of participants from Finland (44%).

Access to national language and foreign language articles by user role

Among 688 participants, 327 users visited national (Finnish and Swedish) language publications, and 386 foreign language publications available on Journal.fi platform. The use of foreign language articles was focused on English, as 379 users visited English language articles and only eight participants visited articles published in the other foreign languages (German and Italian).

As shown in Fig. 2, in case of the national language publications students (42%) are clearly the largest group, and besides researchers (25%), also private citizens (12%) and other experts (11%) figure prominently among users. As regards the foreign language publications, researchers (46%) and students (38%) are more clearly the main user groups.

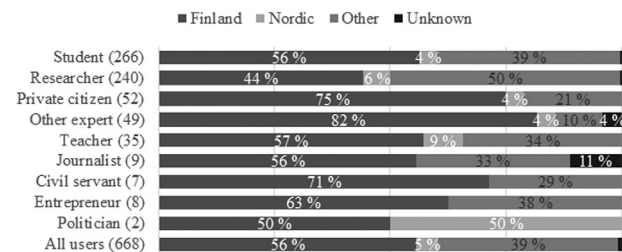


FIGURE 1 Share of survey participants by self-reported user role and country of origin identified based on the IP-address.

Access to old versus new articles

The survey participants visited a total of 1,546 articles from 48 journals participating in the survey study. On average, participants visited three articles but 63% visited only one article. The most active participant visited 148 articles during the period the survey was active (maximum of 54 days). The share of participants visiting two or more articles was considerably larger among participants from Finland (50%) than from the Nordic (28%) or other foreign locations (21%).

As shown in Fig. 3, the survey participants used also the old material available on the Journal.fi platform but focused strongly on the latest contents: while articles published in 2019–2020 amount to 8% of all Journal.fi articles, 25% of the articles visited by the survey participants were published in 2019–2020 (the number of articles are provided in Table 2).

A vast majority, 70.5%, of the 1,546 articles visited by participants are in Finnish, 28.4% in English, 0.6% in Swedish, and 0.6% are in German and Italian. This reflects the overall language distribution of articles available on Journal.fi platform, however the share of English language articles is larger among articles visited by the survey participants (28% compared to 19% overall).

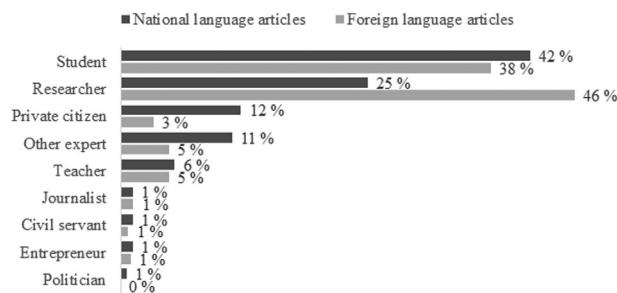


FIGURE 2 Share of survey participants using national language publications (327 users) and share of survey participants using foreign language publications (386 users) by self-reported role.

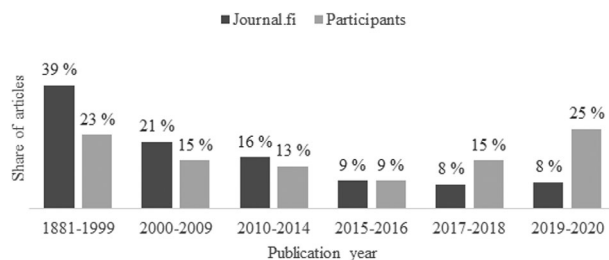


FIGURE 3 Share of articles available on Journal.fi platform and of articles visited by survey participants by year of publication.

TABLE 2 Number of articles available on Journal.fi platform and of articles visited by survey participants by year of publication.

Source	1881-1999	2000-2009	2010-2014	2015-2016	2017-2018	2019-2020	Total
Journal.fi	18,480	10,017	7,681	4,205	3,633	3,954	47,970
Participants	355	233	204	136	233	385	1,546

The 1,546 articles received a total of 2018 visits by 668 participants (counting only one visit by participant per article). As shown in Fig. 4, in the case of articles published in the national languages, as well as those published in the foreign languages, the majority of visits, 35%, concerned the most recent articles published in 2019 or in the beginning of 2020 (the number of articles are provided in Table 3).

Age of articles by user role and language

There are, however, considerable differences between user categories in the age and language of visited articles. As shown in Fig. 5, while students account for 44% of all article visits, these are much less focused on the latest articles compared to other groups. This seems to suggest that older publications provide strong support for learning.

Two-thirds of all the visits by the survey participants were to national language articles (1356) while one-third were to foreign language articles (662) available on Journal.fi platform. As shown in Fig. 6, the share of visits to national language articles is much larger among students and private citizens (78% and 84%, respectively) than the average among all user categories (67%). A slight majority (55%) of the article visits by researchers were to foreign language publications, however it is clear that also researchers are prominent users of national language publications.

National and foreign language articles serve markedly different audiences in terms of the geographical origin of users. As shown in Fig. 7, the vast majority, 97%, of all visits to national (Finnish and Swedish) language articles are by survey participants from Finland. As expected, the foreign (mainly English) language articles available on the Journal.fi platform serve a much more international audience: users from Finland account for 37% of the article visits, while 5% of them come from the Nordic users and 58% from the rest of the world.

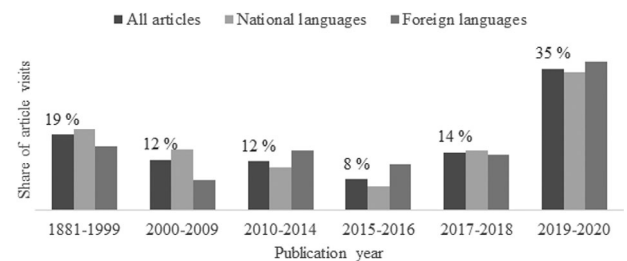
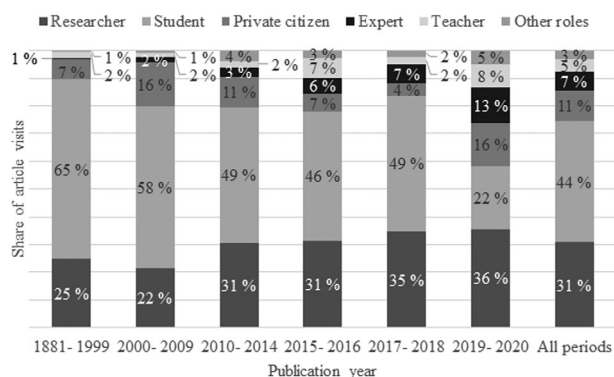
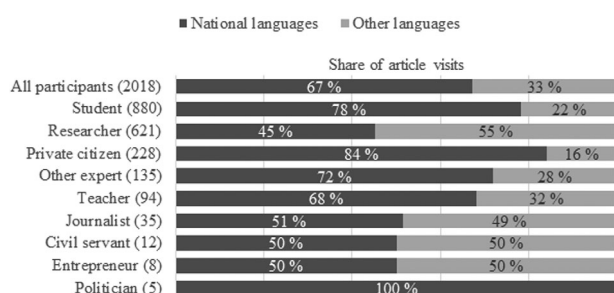
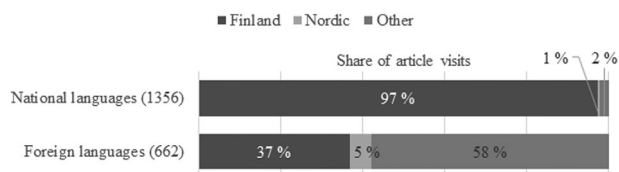


FIGURE 4 Share of visits by survey participants to all articles, and to articles in national and foreign languages by year of publication.

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Source	1881–1999	2000–2009	2010–2014	2015–2016	2017–2018	2019–2020	Total
All article visits	376	251	242	153	289	707	2,018
National languages	271	202	144	78	198	463	1,356
Foreign languages	105	49	98	75	91	244	662

**FIGURE 5** Share of article visits by different user groups and year of publication.**FIGURE 6** Share of visits to national and foreign language articles available on Journal.fi platform by self-reported user role by survey participants.**FIGURE 7** Share of visits to articles available on Journal.fi platform in the national and foreign languages by country of origin of survey participants.

DISCUSSION AND CONCLUSIONS

This paper shows that open access publications in national languages can be central for reaching important users of research

both within and beyond academia, including experts, private citizens, teachers and students. In fact, in the specific context of Finland, these groups appear much more prone to read research that is published in national languages compared to English language publications. This is a strong argument why open access publishing platforms, which provide access to publication in national languages, are an important part of the knowledge infrastructure. Further studies would be needed to investigate to what extent our findings are generalisable across different countries.

In many countries, recent years have seen a shift in the research policy from a narrow focus on international reach and excellence towards a broader agenda where notions of social impact and responsible research have been highlighted. Clearly, the question of open access, and availability of research in languages other than English is part of this broader agenda. This study, despite its limitations in terms of scope and size, does point to the importance of research published in national languages, and it strengthens recent claims regarding the need for preserving and strengthening the language diversity in scholarly communication (Kulczycki et al., 2020).

The vast majority of Finnish OA journals are Diamond OA journals, meaning that they are free for both authors and readers (Late et al., 2020; Linna et al., 2020). A recent study finds that also in other countries OA journals in general, and Diamond OA journals in particular, play an important role in supporting multilingual scholarly communication (Bosman et al., 2021). This Diamond OA study also underscores the fragile economy of Diamond OA journals, often published by learned societies and research institutions, relying mainly on voluntary work of researchers. Diamond OA journals often lack editorial and technical support to meet the best technical standards of OA publishing, as exemplified by DOAJ or Plan S criteria.

One of the main recommendations of the Helsinki Initiative on Multilingualism in Scholarly communication is to 'protect infrastructures for publishing locally relevant research' (Helsinki Initiative, 2019; www.helsinki-initiative.org). The Helsinki Initiative argues that not-for-profit journals and book publishers, which constitute an essential infrastructure for making publishing in the local languages possible, need sufficient resources to maintain high standards of scholarly publishing, and to make a sustainable transition to open access publishing. Platforms such as Journal.fi play a crucial role in facilitating the OA publishing and transition of national journals. The Federation of Finnish Learned Societies is presently launching Edition.fi platform for OA books (<https://edition.fi/>).

In particular, our results highlight the important role of national language publishing in a small language area: there are around five million native speakers of Finnish language, most of whom reside in Finland. This is in stark contrast, for example, to French language, which has over 76 million native speakers and hundreds of millions of more or less proficient speakers around the world. A much larger number of researchers worldwide also study French than Finnish society, culture and language. While the French-language articles on the *Érudit* platform have a wide international readership beyond Canada and France (Cameron-Pesant, 2019), the Finnish language content from the *Journal.fi* platform serves predominantly scholarly, professional and general audiences in Finland.

Our results also point out, in the specific case of *Journal.fi* platform, the important role of students as users of open access and national language journal articles: users who identified themselves as students account for 40% of 668 users participating in the survey during Spring 2020. This is consonant with earlier studies based on Mendeley, showing that readers of research papers are predominantly PhD and post-graduate students (Haustein & Larivière, 2014; Mohammadi et al., 2015). While such earlier studies have mainly focused on English language publications, our findings suggest that articles in the national languages are particularly important for students and learning. Our results also suggest that students make use of the older articles more often than other users, especially researchers. This is consonant with findings of a study regarding the reading patterns of Finnish scholars, according to which 'doctoral students and postdocs use more articles published more than five years ago' (Late et al., 2019).

Our results suggest entrepreneurs are not interested in or aware of information available on *Journal.fi* platform, as their share of users is only 1%. This result may seem to undermine a point often stated in favour of open access, namely that free and easy access to research articles accelerates innovation and economic growth. However, open access in this context usually means open access to research data rather than research publications (see e.g. meta-study on economic impact of open access by Tennant et al., 2016). Another possible explanation could be that the *Journal.fi* platform hosts mainly SSH journals, which may not offer straightforwardly applicable information for business interest. It is also plausible that *Journal.fi* is not yet a well-known service among this group of users.

Publications from the most recent years attract most users, and this applies not only for researchers and students, but even more so for private citizens and 'other experts'. Hence, the rapid dissemination and accessibility to recent research is of great importance not only for researchers themselves but also to a wider audience. While new publications attract a considerable share of the views, there is still a relatively large interest, especially among students, in older materials. Thus, the use of materials, stretching as far back as 1883 highlights the need to digitalize and keep older contents accessible online.

In terms of method, we find that the approach of using an online questionnaire, which targeted active users of the platform,

was an effective method. However, the self-selection of participants may lead to the underrepresentation of certain groups. For example, it could be that some groups are more prone to take part in the survey (students) compared to others (researchers). This is a question that would be interesting to study further using other methods for sampling users.

While this study focuses on the use of OA-publications in national languages, we deem that the methodology could be further developed in order to understand how academic knowledge is used in broader society. For example, users could be asked about their purpose for using a specific material, and such studies could further our understanding of the wider societal impact of research. More detailed studies looking at specific fields would also allow for more exact conclusions to be drawn regarding the use of research from different academic disciplines.

Finally, this study focused on a relatively small language context of Finland, and similar approaches for studying the use of non-English language publications in other, and larger, countries and regions would be of interest for understanding academic publishing in national languages more generally. Our analysis shows that also in a small language area, such as Finland, scholarly communication and open access to publications in the national languages are vital for local relevance and outreach of research.

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