

Statistics on Directory of Open Access Books

Keita Tsuji

Faculty of Library, Information and Media Science, University of Tsukuba, Japan

Abstract: The bibliographic information of open access (OA) books available through the Directory of Open Access Books (DOAB) was investigated. The chronological changes in the number of titles and the distribution of subjects, languages, publishers, publication/add-on years, licensing patterns, etc., were clarified. The sample comprised 13,253 OA books, which were available through the DOAB as of December 31, 2018. The results showed that OA books were increasing at an accelerating rate, although the speed at 2018 slightly decreased. As for the distribution of subjects, Science (“Q”), Social Sciences (“H”), and Political Science (“J”) were the most popular. With regard to languages, English, French, German, Portuguese, and Spanish were the most common. As for the publishers, Frontiers Media SA, De Gruyter, MDPI, Presses universitaires de Rennes, and ANU Press were the most popular. As for the licensing patterns, “CC by-nc-nd” and “CC by” were the most popular. Considering these tendencies, libraries should begin to utilize OA books by, for instance, providing them as part of their collections.

Keywords: Open Access Books, OA books, OA monographs, Directory of Open Access Books, DOAB

1. Introduction

Open access (henceforth OA) has already been popular in the field of journal papers, and now it has started to gain a certain position in the field of monographs, or books. In the present paper, OA books are investigated, and the number of titles and the distribution of subjects, languages, publishers, publication years, licensing patterns, etc., will be clarified. Their chronological changes will also be shown.

Although the definition of OA books and OA monographs has not been clearly stated,¹⁾ many articles and reports have been published on them. In the present paper, we define OA books as books of research output that are in electronic form and available on the Web free of charge.

There are two representative directories or repositories of OA books. One is the Directory of Open Access Books (DOAB), and the other is the Open Access Publishing in European Networks (OAPEN) Library. Both are provided by the OAPEN Foundation. The DOAB is a discovery service for peer-reviewed OA books, with links to the full texts of the publications at the OAPEN Library, publisher’s website, or repositories (Adema, 2012; Karak & Mandal, 2017). The DOAB was officially launched on July 1, 2013, at the Open Access Monographs in the Humanities and Social Sciences Conference at the British Library in London (Ferwerda, 2014; Karak & Mandal, 2017). However, it had been operating unofficially since 2011, and its beta version was launched in 2012. Lamani (2018) stated, “The Directory of Open Access Books (DOAB) is the major milestone in facilitating organized access to open access e-books.”

In the present paper, we investigate all 13,253 titles provided by the DOAB. We leave it for future research to investigate OA books provided by the

OAPEN Library. One reason is that the number of titles provided by the OAPEN Library is smaller than that provided by the DOAB. Furthermore, OA books available through the DOAB have a higher degree of Open Access; i.e., they have higher reusability than those in the OAPEN Library in the licensing sense. Snijder (2013) stated that Amsterdam University Press had placed almost 400 books in the OAPEN Library and that less than half of them were also available through the DOAB. He said that only books with a license that enabled readers to share the contents were allowed in the DOAB. Although it is an interesting direction to compare titles available through the DOAB and the OAPEN Library or to investigate the disjunction of OA books available through them, we leave it for future research.

There are three papers that have investigated the OA books available through the DOAB (no paper was found on those available through the OAPEN Library). Karak and Mandal (2017) investigated OA books in the field of Library and Information Science. They found 35 books and analyzed (1) the year-wise distribution and growth, (2) the number of authors, (3) publishers who were actively involved in the DOAB, (4) language-wise distribution, (5) licensing patterns, and (6) the number of pages. Khanchandani and Kumar (2017) investigated 1,052 OA books available through the DOAB in the field of Science and Technology. They analyzed the books' publishers, licenses, and language-wise distribution. Lamani et al. (2018) investigated 1,200 OA books available through the DOAB in the field of Social Sciences. They analyzed the books' subjects, the number of authors, the licenses, languages, publication years, and pagination-wise distribution. However, few studies have been done on all the titles available through the DOAB regardless of their field. As we mentioned above, we will investigate all 13,253 titles available through the DOAB. The results clarify the current status of OA books and can be used for discussion of the preferable future of OA books.

The main objectives of the present study are:

- To show the statistics on OA books available through the DOAB such as their distribution of the subjects, languages, publishers, publication/add-on years, licensing patterns.
- To find out the chronological changes of the above mentioned data for discussion of the preferable future of OA books.
- To identify the active OA books publishers to promote their further contribution.

2. Related Studies

In this section, we will outline the papers related to OA books. The preceding papers can be classified into six types: (A) those describing the current status and problems of OA books in one institution or in general (Snijder, 2013; Hacker, 2014; Crossick, 2015; Collins & Milloy, 2016; Amano, 2017; Chakrabarti & Mandal, 2017; Hacker & Corrao, 2017; Speicher, 2017; Tanabe, 2017; Mongeau, 2018); (B) those investigating the impacts of OA books on sales of printed books and on academic fields (Ferwerda et al., 2013; Snijder, 2016; Speicher, 2016; Neylon et al., 2018); (C) those studying the users or usages of OA books (Adema, 2012; Ferwerda et al., 2013; Montgomery et al., 2017); (D) those focusing on business models (Adema, 2010; Ferwerda, 2014; London Economics, 2015); (E) those emphasizing the direction that OA books should take in the future (Jisc Collections & OAPEN Foundation, 2016; Christopher et al., 2017); and (F) those investigating the bibliographic

information of OA books (Karak & Mandal, 2017; Khanchandani & Kumar, 2017; Lamani et al., 2018). Since we have already outlined type (F) above, we will introduce the rest, i.e., from (A) to (E), in the following paragraphs.

Among papers of type (A), Snijder (2013) reported on the relationship between Amsterdam University Press (AUP), the OAPEN Library, the DOAB, and IMISCOE (International Migration, Integration and Social Cohesion). He stated that the OAPEN Library and DOAB platforms were very useful tools for promoting OA books. Hacker (2014) described the challenges in publishing OA books at the University of Heidelberg and pointed out the importance of collaboration between scholars and publishers. Crossick (2015) showed that the so-called monograph crisis did not exist and examined (1) the advantages and drawbacks of the various models for OA monographs, (2) the strengths of the print monograph, (3) the problems of licensing, (4) third-party rights, (5) the implications for other stakeholders (such as publishers, learned societies, universities, and university libraries), (6) international cooperation issues, and (7) suggestions for policymakers. Collins and Milloy (2016) reported the main findings from the OAPEN-UK research project, a five-year study into OA monograph publishing in the Humanities and Social Sciences. They first referred to the perspectives of five main groups (researchers, institutions, publishers, learned societies, and funders). Then they referred to the technical and organizational elements of producing an OA monograph and the characteristics that a successful business model of an OA monograph would have. Amano (2017) described the current status and challenges of OA books in the fields of Humanities and Social Sciences in Europe, referring to their various business models, dissemination, and preservation. Chakrabarti and Mandal (2017) investigated the growth, languages, copyright licensing, and publishers of 35 e-books in the Library and Information Science field available through the DOAB. Hacker and Corrao (2017) reported the challenges, accomplishments, and setbacks that Heidelberg University's newly founded OA publisher, heiUP, experienced. They discussed issues such as acquiring manuscripts, designing and building workflows, and building an outlet for the finished product. Speicher (2017) examined the current status of OA monographs and UK university presses. Tanabe (2017) examined the programs by Springer on OA and scholarly books. Mongeau (2018) described the current models, trends, and issues of OA monograph publishing.

Among papers of type (B), Ferwerda et al. (2013) reported the results of OAPEN-NL, which was a project to gain experience in the OA publication of monographs in the Netherlands. OAPEN-NL examined (1) user needs and perceptions about the OAPEN's publishing model for OA monographs, (2) the costs of monograph publishing in the Netherlands, and (3) the effects of OA on sales and scholarly impact. They stated that OAPEN-NL found no evidence of an effect of OA on sales (since Ferwerda et al. also investigated user needs and perceptions, their paper also falls into type [C]). Snijder (2016) investigated whether OA had a positive influence on the number of citations and tweets a monograph received. He found a slight OA advantage and that it depended on the language and subjects of the books. Speicher (2016) reported the effect on print sales of OAPEN-NL and OAPEN-UK/Jisc making a book OA. She also described the experience of the University College London Press and stated that OA seemed to have little effect on print sales. Neylon et al. (2018) investigated the extent to which OA books could be seen by the communities that might make use of them. They focused on OA books made available by publishers and platforms that were part of the OPERAS network, which was focused on the development of a European research infrastructure.

Among papers of type (C), Adema (2012) reported on DOAB users' needs, expectations, and experiences of OA. These covered the awareness of the importance of OA; quality control, especially, peer-reviews; licensing; business models; and the DOAB itself. Montgomery et al. (2017) investigated the usage of OA books via the JSTOR Platform. They investigated where the readers came from, the most popular subjects of the books, readers' behavior when they downloaded or viewed books, and publishers' perspectives.

Among papers of type (D), Adema (2010) investigated various initiatives' OA business models, publishing models, and publishing processes. Initiatives included commercial publishers and presses established by societies, academies, libraries, and universities, etc. Ferwerda (2014) gave an overview of six business models of OA books: (1) hybrid models (which provided free versions of publications and the sale of premium editions), (2) institutional support (the receipt of direct financial support through grants or indirect support through subsidies from the parent institute, etc.), (3) author-side publication charges (derived from the Article Processing Charge model for OA journals), (4) library-side models (which used library budgets to support OA publications), (5) crowdfunding, and (6) green OA. London Economics (2015) examined business models for OA monographs and assessed issues relating to cost recovery, quality control, and the incentives for authors and publishers. They identified six types of business model, such as those by traditional publishers and new university presses.

Among papers of type (E), Jisc Collections and the OAPEN Foundation (2016) reported on the potential centralized services that would support and encourage the publication of OA peer-reviewed monographs and presented recommendations for their establishment. Christopher et al. (2017) conducted a survey of academic libraries in the United States and concluded that library-funded OA book initiatives could successfully scale up if they employed sustainable business models, offered quality content, and provided participants with usage data.

3. Method

In this section, we will explain the data and aspects we investigated concerning DOAB OA books.

3.1 Data We Used

The DOAB said that it had "13253 academic peer-reviewed books and chapters from 286 publishers," as of December 31, 2018.²⁾ We downloaded a CSV file from DOAB on December 31, 2018.³⁾ The file contained the works' "Title," "ISBN," "Authors," "Pages," "Publisher," "Languages," and "Year of publication," etc. It also contained information about (1) dates on which the books or chapters were added to the DOAB, as "Added-on date," and (2) the Library of Congress Classification (henceforth "LCC") codes as "Subjects."

Books and chapters are not distinguished in the above-mentioned CSV file. If we check each item manually, we may be able to distinguish books from chapters, but doing so would be quite labor-intensive. Here, we would like to recall UNESCO's definition of a book: "a non-periodical printed publication of at least 49 pages" (UNESCO, 1964). Among the 13,253 items (i.e., books or chapters) in the CSV file, (1) for "Pages," 5,188 items were not available (i.e., their data were NULL), and (2) among the rest, 8,065, only 181 (i.e., 2.2%) were less than 49 pages in length. We regard 2.2% as sufficiently small, and the

results concerning all 13,253 items provide a good image or approximation of OA books. We did not remove the 181 chapters from the 8,065 items because doing so would require us to remove chapters from the other 5,188 items for consistency. That would be very labor-intensive, and we think that the effect on our results by such a removal would be small. Henceforth we will refer to both books and chapters as “titles” and show the results for them. We regard the results for titles to be very close to the results for books, as we previously mentioned.

3.2 Aspects We Investigated

First, we investigated the 13,253 titles’ subjects, languages, publishers, publication years, licensing patterns, and years when the titles were added on the DOAB (henceforth, the “added-on years”). These data were obtained from the columns “Subjects,” “Languages,” “Publisher,” “Year of publication,” “License,” and “Added-on date,” respectively. We also investigated any chronological changes and the distribution of combinations of subjects, languages, and publishers.

As for the subjects, we only used the first characters of the LCC subjects. For instance, if a book was assigned the LCC subject “JF20-2112,” we regarded the subject of the book to be just “J” (Political Science). When multiple LCC subjects were assigned to one book, we adopted the first one as its LCC subject. For instance, if a book was assigned LCC subjects such as “HB1-3840; D1-2009,” we regarded the subject of the book to be “H” (Social Sciences). The representations of the language of each title in the DOAB CSV file were somewhat noisy. We regarded the character sequences in the right-hand column in Table 1 to represent the language shown in the left-hand column.

Table 1: Languages and Their Corresponding Character Sequences

English	en, english, Englisch
French	fre, Fre
German	de, Deutsch
Italian	ita, italian
Spanish	spa
Portuguese	pt, por
Slovenian	Slovene

4. Results

In this section, we will show the results for (1) the number of titles, (2) distribution of subjects, (3) distribution of languages, (4) combination of subjects and languages, (5) combination of publication and added-on years, (6) distribution of publishers, and (7) licensing patterns, in that order.

4.1 Number of Titles

As previously mentioned, the number of titles available through the DOAB as of December 31, 2018, was 13,253. On the basis of the added-on years, the numbers of titles available through the DOAB as of end of the 2011, 2012, 2013, 2014, 2015, 2016, 2017 and 2018 were estimated to be 485, 1,173, 1,529, 2,425, 3,715, 5,691, 10,247 and 13,253, respectively. Figure 1 shows these numbers. It can be seen in Figure 1 that the number of titles available through DOAB increases at an accelerating rate, although the speed at 2018 slightly

decreased.

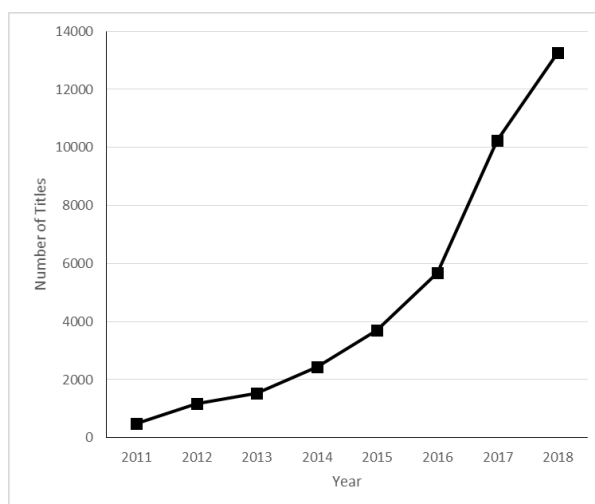


Figure 1: Changes in the Number of Titles Available through the DOAB

4.2 Distribution of Subjects

The subject-wise numbers of titles available through the DOAB from 2011 to 2018 are shown in Table 2. In Table 2, the leftmost “A” to “Z” represent the LCC subjects.⁴⁾ The subjects that the letters represent are shown in Table 3. For instance, Tables 2 and 3 show that the ratio of the number of titles in Law (“K”) available through the DOAB as of 2011 is 10.1%. It can be seen in Table 2 that the most popular subject as of December 31, 2018 is Science (“Q”), which accounts for 9.1% (1,200 titles) of OA books available through the DOAB. The second-most and the third-most popular subjects are Social Sciences (“H”) and Political Science (“J”), respectively (8.3% and 7.9%).

Table 2: Subject-wise Ratios of Titles

	2011	2012	2013	2014	2015	2016	2017	2018
A	0.0	0.0	0.0	0.6	0.5	0.4	0.2	0.2
B	6.8	6.1	5.5	5.7	6.2	6.7	5.0	4.9
C	1.2	1.9	1.6	1.3	1.0	0.9	0.7	0.6
D	9.9	7.3	7.1	7.3	6.9	9.4	6.6	6.4
E	0.2	2.4	1.9	1.4	1.1	0.8	0.6	0.5
F	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1
G	3.3	6.5	5.7	4.8	4.2	4.1	3.8	3.7
H	21.2	17.4	16.0	13.7	11.7	10.6	8.1	8.3
J	18.8	16.3	13.7	11.4	10.8	8.4	5.5	7.9
K	10.1	6.3	6.6	6.3	4.7	4.1	3.0	3.9
L	1.2	2.0	2.0	2.0	2.9	2.6	2.3	2.5
M	0.2	0.2	0.1	0.3	0.4	0.4	0.3	0.3
N	1.0	1.0	1.4	1.6	1.6	1.6	1.1	1.1
P	9.7	11.6	11.2	9.6	9.2	8.5	6.6	7.0
Q	8.5	6.1	6.0	5.8	6.8	9.6	7.7	9.1
R	1.6	2.0	2.0	3.9	6.0	9.4	6.5	7.0
S	1.6	1.2	0.9	0.9	0.8	0.7	0.5	0.6
T	3.5	3.8	3.6	3.3	2.9	3.1	2.7	3.1
U	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Z	0.6	1.2	1.4	1.2	0.8	0.8	0.5	0.5
N/A	0.4	6.6	13.3	18.5	21.3	17.7	38.1	32.4
Total	485	1,173	1,529	2,425	3,715	5,691	10,247	13,253

Table 3: LCC Codes

A	General Works
B	Philosophy. Psychology. Religion
C	Auxiliary Sciences of History
D	World History and History of Europe, Asia, Africa, Australia, New Zealand, etc.
E	History of the Americas
F	History of the Americas
G	Geography. Anthropology. Recreation
H	Social Sciences
J	Political Science
K	Law
L	Education
M	Music
N	Fine Arts
P	Language and Literature
Q	Science
R	Medicine
S	Agriculture
T	Technology
U	Military Science
V	Naval Science
Z	Bibliography. Library Science. Information Resources (General)

The ratios of the numbers of titles of subjects “H,” “J,” “K,” “P,” “Q,” and “R” for 2011 to 2018 are shown in Figure 2. These six subjects were chosen because their chronological changes were large. It can be seen in this figure that the ratios of Social Sciences (“H”) and Political Science (“J”) were decreasing significantly. The ratios of Law (“K”) and Language and Literature (“P”) were also decreasing. On the other hand, the ratios of Science (“Q”) and Medicine (“R”) were increasing.

DOAB seems to have started with books on social sciences and humanities, however, the ratios of such books are not prominent now. Although the ratios of books on sciences and medicines are increasing, their ratios are not prominent too. From the LCC’s point of view, they are in the status of “being well-balanced.” Needless to say, it is a superficial statement (and thus with quotation marks) because (1) the ratios might change if other classification system was used and (2) truly well-balanced status is difficult to define or determine.

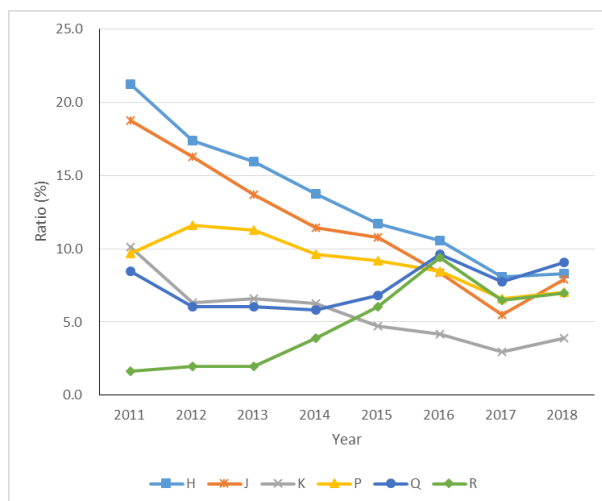


Figure 2: Changes in the Ratios of Titles of Subjects H, J, K, P, Q and R

4.3 Distribution of Languages

The numbers and percentages of titles of each language available through the DOAB as of December 31, 2018 are shown in Table 4. It can be seen from Table 4 that the most popular language was English, which accounts for 49.5% (6,634 titles) of titles available through the DOAB. French, German, Portuguese, and Spanish follow. These five languages account for 91.4% of books available through the DOAB.⁵⁾

Table 4: Numbers and Percentages of Titles in Each Language

English	6,634 (49.5)	Greek	7 (0.1)
French	2,664 (19.9)	Romansh	7 (0.1)
German	1,741 (13.0)	Russian	6 (0.0)
Portuguese	702 (5.2)	Afrikaans	5 (0.0)
Spanish	497 (3.7)	Danish	4 (0.0)
Italian	328 (2.4)	Czech	3 (0.0)
Dutch	155 (1.2)	Estonian	3 (0.0)
Finnish	34 (0.3)	Arabic	2 (0.0)
Norwegian	30 (0.2)	Albanian	1 (0.0)
Swedish	12 (0.1)	Ancient Greek	1 (0.0)
Catalan	10 (0.1)	Chinese	1 (0.0)
Lithuanian	10 (0.1)	Church	1 (0.0)
Slovenian	9 (0.1)	Tibetan	1 (0.0)
Turkish	9 (0.1)	Welsh	1 (0.0)
Latin	8 (0.1)	N/A	508 (3.8)
Total		13,394 (100.0)	

The numbers of titles in English, French, German, Portuguese, Spanish, and Italian added to the DOAB during the period from 2011 to 2018 are shown in Table 5. It can be seen from Table 5 that, for instance, the number of titles written in French added in 2014 was 145. Figure 3 was generated on the basis of the numbers from Table 5. It can be seen from Figure 3 that the number of added titles written in English was consistently the largest except in 2017. In 2017, the number of added titles written in French increased sharply, exceeding English, however, it sharply decreased in 2018.

Table 5: Numbers of Added Titles in Six Languages

	English	French	German	Portuguese	Spanish	Italian
2011	179	1	92	0	0	73
2012	502	7	60	0	0	0
2013	185	4	150	0	2	12
2014	433	145	90	123	68	18
2015	634	190	90	291	47	20
2016	1,352	121	243	115	46	22
2017	1,621	2,054	245	76	264	81
2018	1,728	142	771	97	70	102

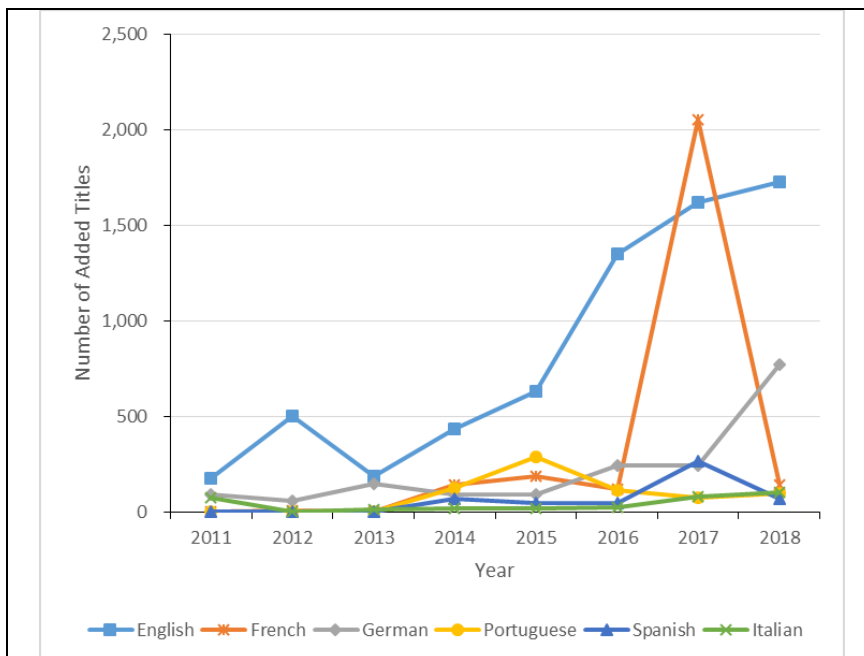


Figure 3: Changes in the Numbers of Added Titles in Six Languages

4.4 Combination of Subjects and Languages

The numbers and percentages of subjects for the titles written in English, French, German, Portuguese, Spanish, and Italian available through the DOAB as of December 31, 2018, are shown in Table 6. In Table 6, the leftmost “A” to “Z” represent the LCC subjects again. For instance, the number of titles in Social Sciences (“H”) written in English is 684. It accounts for 10.3% of the titles written in English.

It can be seen from Table 6 that the most popular subjects of books written in English are Science (“Q”), Medicine (“R”), and Social Sciences (“H”), which account for 16.0%, 11.1%, and 10.3%, respectively. As for German, Political Science (“J”), Law (“K”) and World History and History of Europe, Asia, Africa, Australia, New Zealand, etc. (“D”) are the most popular, which accounts for 21.5%, 14.3% and 10.3%, respectively. Unfortunately, many of the French books in the DOAB are not assigned LCC codes. More specifically, 95.1% of French books do not have them. If they had been so assigned, we would have been able to analyze the tendency of OA French books’ subjects more precisely.

Table 6: Numbers and Percentages of Subjects and Languages of the Titles

	English	French	German	Portuguese	Spanish	Italian
A	5 (0.1)	1 (0.0)	1 (0.1)	0 (0.0)	15 (3.0)	0 (0.0)
B	422 (6.4)	12 (0.5)	68 (3.9)	82 (11.7)	27 (5.4)	12 (3.7)
C	59 (0.9)	2 (0.1)	12 (0.7)	0 (0.0)	2 (0.4)	5 (1.5)
D	444 (6.7)	30 (1.1)	179 (10.3)	12 (1.7)	62 (12.5)	49 (14.9)
E	20 (0.3)	0 (0.0)	1 (0.1)	3 (0.4)	4 (0.8)	1 (0.3)
F	1 (0.0)	0 (0.0)	0 (0.0)	2 (0.3)	9 (1.8)	0 (0.0)
G	338 (5.1)	7 (0.3)	28 (1.6)	5 (0.7)	2 (0.4)	7 (2.1)
H	684 (10.3)	13 (0.5)	131 (7.5)	98 (14.0)	23 (4.6)	27 (8.2)
J	500 (7.5)	6 (0.2)	375 (21.5)	75 (10.7)	13 (2.6)	22 (6.7)
K	173 (2.6)	3 (0.1)	249 (14.3)	12 (1.7)	52 (10.5)	22 (6.7)
L	159 (2.4)	3 (0.1)	21 (1.2)	72 (10.3)	22 (4.4)	24 (7.3)
M	22 (0.3)	0 (0.0)	6 (0.3)	10 (1.4)	0 (0.0)	0 (0.0)
N	73 (1.1)	2 (0.1)	27 (1.6)	17 (2.4)	2 (0.4)	16 (4.9)
P	563 (8.5)	23 (0.9)	116 (6.7)	85 (12.1)	21 (4.2)	39 (11.9)
Q	1,059 (16.0)	13 (0.5)	37 (2.1)	43 (6.1)	3 (0.6)	12 (3.7)
R	734 (11.1)	5 (0.2)	27 (1.6)	134 (19.1)	2 (0.4)	4 (1.2)
S	58 (0.9)	0 (0.0)	7 (0.4)	3 (0.4)	0 (0.0)	2 (0.6)
T	336 (5.1)	8 (0.3)	23 (1.3)	18 (2.6)	2 (0.4)	7 (2.1)
U	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Z	40 (0.6)	2 (0.1)	9 (0.5)	2 (0.3)	4 (0.8)	10 (3.0)
N/A	943 (14.2)	2,534 (95.1)	424 (24.4)	29 (4.1)	232 (46.7)	69 (21.0)
Total	6,634 (100.0)	2,664 (100.0)	1,741 (100.0)	702 (100.0)	497 (100.0)	328 (100.0)

4.5 Combination of Publication and Added-on Years

The year-wise publication and added-on numbers of titles are shown in Table 7. For instance, the number of titles that were published during the period from 2005 to 2009 and that were added to the DOAB in 2012 is 254. Because there were 37 titles whose publication years were lacking in DOAB data, the total is 13,216, which is different from 13,253 in other Tables.

It can be seen from Table 7 that some titles were added to the DOAB as OA books before being published. For instance, five titles that were published in 2014 had been added to the DOAB in 2013. It was found that 51 titles in total were or would be published after they were added to the DOAB (23 titles which were added to DOAB in 2018 are going to be published in 2019).

Table 7: Year-wise Publication and Added-on Numbers for Titles

		Added-on Year								Total
		2011	2012	2013	2014	2015	2016	2017	2018	
Publication Year	~ 1999	5	23	5	82	74	129	829	242	1,389
	2000~2004	135	34	19	74	76	57	530	95	1,020
	2005~2009	261	254	50	113	228	123	730	195	1,954
	2010	46	116	21	29	93	20	176	98	599
	2011	36	142	24	47	25	45	170	85	574
	2012		114	98	111	28	36	156	74	617
	2013		4	134	198	57	56	144	125	718
	2014			5	237	244	142	147	146	921
	2015				4	462	556	166	149	1,337
	2016				1	2	802	447	234	1,486
	2017						6	1,046	405	1,457
	2018							6	1,115	1,121
	2019								23	23
Total		483	687	356	896	1,289	1,972	4,547	2,986	13,216

4.6 Distribution of Publishers

The publisher-wise numbers of titles added to the DOAB during the period from 2011 to 2018 are shown in Table 8. The leftmost column shows the publishers' names, sorted in descending order of the total number of titles shown in the rightmost column. It can be seen in Table 8 that the five publishers that added the most works to the DOAB are Frontiers Media SA, De Gruyter, MDPI - Multidisciplinary Digital Publishing Institute, Presses universitaires de Rennes and ANU Press (henceforth, the "top five publishers"). While the total number of titles available through the DOAB increased at an

accelerating rate (see Figure 1), the number of titles added to the DOAB by each publisher did not follow the same pattern. For instance, Presses universitaires de Rennes added all of its 528 titles in 2017, and ANU Press added 189 titles in 2012 and zero in 2013.

As previously mentioned, the speed of increasing of the number of OA titles dropped in 2018. This is partly due to the French publishers that had not added OA titles until 2017, added many titles in 2017 and did not add in 2018. For instance, Presses universitaires de Rennes (528), Institut français d'études andines (124), Presses universitaires de Provence (122), and Presses universitaires François-Rabelais (91) are true of this case (the numbers in parenthesis are the number of OA titles that they added just in 2017).

The numbers of titles added to the DOAB by the above-mentioned five top publishers during the period from 2011 to 2018 are shown in Figure 4. It can be seen in Figure 4 that the numbers of titles added by De Gruyter and MDPI - Multidisciplinary Digital Publishing Institute has increased constantly. On the other hand, the number of titles added by ANU Press has decreased. The number of titles added by Frontiers Media SA and Presses universitaires de Rennes are showing sharp increasing and decreasing.

Table 8: Numbers of Titles Added to the DOAB by Each Publisher

	2011	2012	2013	2014	2015	2016	2017	2018	Total
Frontiers Media SA	0	0	1	0	176	542	208	241	1.168
De Gruyter	0	17	11	33	40	176	105	575	957
MDPI – Multidisciplinary Digital Publishing Institute	0	0	0	2	50	92	134	346	624
Presses universitaires de Rennes	0	0	0	0	0	0	528	0	528
ANU Press	1	189	0	145	42	55	43	37	512
Springer	1	10	17	26	24	64	202	92	436
Amsterdam University Press	136	42	26	9	13	33	41	21	321
Universitätsverlag Göttingen	101	40	39	25	1	57	29	21	313
Brill	24	21	1	4	0	136	51	14	251
transcript Verlag	0	0	0	1	3	7	64	169	244
Bohlu	0	0	86	49	34	18	30	21	238
punctum books	0	0	0	63	42	22	62	15	204
SciELO Books – Editora UNESP	0	0	0	2	95	63	11	13	184
SciELO Books – Editora FIOCRUZ	0	0	0	87	1	38	2	53	181
Bloomsbury Academic	0	38	20	25	45	10	8	31	177
Open Book Publishers	0	21	7	11	14	8	51	63	175
Manchester University Press	90	1	0	2	0	12	34	35	174
Ledizioni – LediPublishing	0	0	30	11	20	23	27	41	152
Graduate Institute Publications	0	0	0	0	0	0	147	0	147
Palgrave Macmillan	5	0	1	0	15	17	44	61	143
Collège de France	0	0	0	79	23	25	15	0	142
Athabasca University Press	0	67	10	16	0	24	7	10	134
Leuven University Press	0	0	0	0	0	1	129	0	130
Presses de l'Ifpo	0	0	0	62	61	2	2	0	127
Institut français d'études andines	0	0	0	0	0	0	124	0	124
Other	127	242	107	244	591	551	2,458	1,147	5,467
Total	485	688	356	896	1,290	1,976	4,556	3,006	13,253

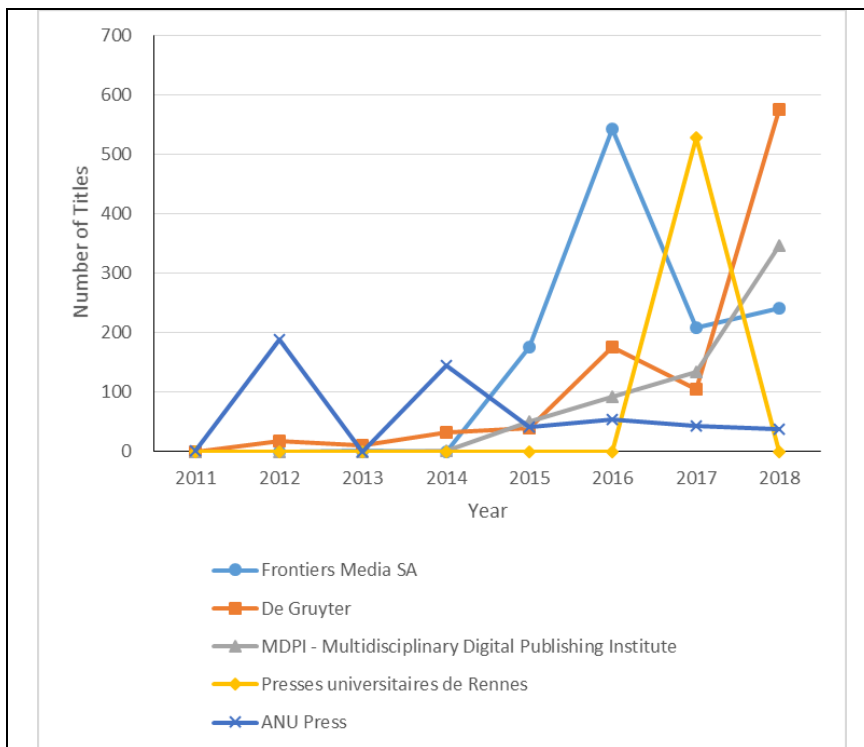


Figure 4: Numbers of Titles Added to the DOAB by the Top Five Publishers

The numbers and percentages of subjects for the titles added by the top 10 publishers are shown in Table 9. It can be seen from Table 9 that nearly 90% of the subjects for the titles added by Frontiers Media SA were Medicine (“R”) and Science (“Q”), which account for 41.2% and 47.2%, respectively. The top three subjects for the titles added by MDPI - Multidisciplinary Digital Publishing Institute were Science (“Q”), Technology (“T”) and Medicine (“R”), which account for 30.8%, 18.3%, and 13.1%, respectively. The top three subjects for the titles added by ANU Press were Political Science (“J”), Social Sciences (“H”) and Geography - Anthropology - Recreation (“G”), which account for 25.4%, 22.5%, and 12.1%, respectively. As for De Gruyter, they were Political Science (“J”), World History and History of Europe, Asia, Africa, Australia, New Zealand, etc. (“D”) and Language and Literature (“P”), which account for 28.6%, 18.2%, and 13.3%, respectively. From this result, it can be said that Frontiers Media SA and MDPI were mainly adding STM. On the other hand, ANU Press and De Gruyter were main adding Social Sciences and Humanities titles. As for Springer, the top three subjects for its titles were Science (“Q”), Social Sciences (“H”) and Technology (“T”), which account for 20.2%, 20.0%, and 17.2%, respectively. Springer is adding both STM and Social Sciences titles.

Table 9: Numbers and Percentages of Subjects for the Titles Added by the Top 10 Publishers

	Frontiers Media SA	De Gruyter	MDPI – Multidisciplinary Digital Publishing Institute	Presses universitaires de Rennes	ANU Press	Springer	Amsterdam University Press	Universitätsverlag Göttingen	Brill	transcript Verlag
A	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
B	8.0	12.1	2.2	0.0	3.7	1.4	4.4	5.1	3.6	1.2
C	0.0	0.9	0.2	0.0	3.5	0.2	1.6	0.6	0.4	0.0
D	0.0	18.2	0.0	0.0	10.2	0.5	9.0	5.8	50.2	6.6
E	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
G	0.9	0.8	9.3	0.0	12.1	8.3	0.6	6.1	0.4	2.0
H	0.0	2.2	5.8	0.0	22.5	20.0	28.3	14.4	13.5	30.7
J	0.0	28.6	0.0	0.0	25.4	3.2	19.3	1.3	4.8	43.4
K	0.0	8.5	0.3	0.0	6.4	2.8	3.4	30.0	0.0	0.0
L	0.0	0.6	0.5	0.0	1.0	11.5	1.9	2.2	0.0	0.8
M	0.0	0.1	0.2	0.0	0.2	0.2	0.0	1.3	0.0	0.4
N	0.0	1.7	0.2	0.0	1.2	0.5	1.9	3.2	0.4	2.5
P	0.0	13.3	0.0	0.0	2.3	1.8	18.1	6.4	2.4	7.8
Q	47.2	4.1	30.8	0.0	4.3	20.2	9.0	10.9	0.8	0.0
R	41.2	1.6	13.1	0.0	2.0	9.4	0.6	5.4	0.8	0.8
S	0.0	0.3	1.6	0.0	2.5	2.3	0.6	1.9	0.0	0.0
T	2.7	1.7	18.3	0.0	1.4	17.2	0.6	3.8	0.0	0.8
U	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Z	0.0	2.7	0.0	0.0	1.2	0.0	0.0	0.3	0.4	0.0
N/A	0.0	2.5	17.6	100.0	0.2	0.5	0.6	1.3	22.3	2.0
Total	1,168	957	624	528	512	436	321	313	251	244

4.7 Licensing Patterns

Chronological changes in the percentages of the licensing patterns are shown in Table 10.⁶⁾ It can be seen from Table 10 that the most popular pattern is “CC by-nc-nd” as of December 31, 2018, which accounts for 34.1% of total 13,253 titles. The second-most popular pattern is “CC by,” which almost constantly increased from 2011 to 2018 (i.e., from 0.4% to 17.4%). Note that “CC by” is the most accommodating licensing pattern, which requires only attribution display and even allows commercial re-use.

The distribution of the licensing patterns of the top 25 publishers is shown in Table 11. It can be seen from Table 11 that the licensing pattern preferred by each publisher differs significantly. For instance, Frontiers Media SA prefers “CC by” (100% of their 1,168 titles belong to this pattern). De Gruyter prefers “CC by-nc-nd” (93.9% of their 957 titles belong to this pattern). Quite a few publishers adopt more than one licensing pattern. For instance, Springer is adopting “CC by-nc” (51.8%) and “CC by” (45.4%), while Amsterdam University Press is adopting “CC by-nc” (52.3%) and “CC by-nc-nd” (45.2%). It would be interesting to pursue the criteria that are leading the publishers to adopt different patterns.

Table 10: Changes in the Percentages of Licensing Patterns

	CC by-nc-nd	CC by	CC by-nc-sa	CC by-nc	CC by-sa	CC by-nd	N/A	Total
2011	55.5	0.4	0.0	27.8	0.0	16.1	0.2	485
2012	55.8	0.7	0.0	14.7	0.7	9.6	18.6	1,173
2013	58.7	1.6	1.9	12.9	1.0	9.3	14.5	1,529
2014	47.9	2.1	9.8	11.1	1.8	6.2	21.1	2,425
2015	37.5	9.5	16.1	9.8	1.4	4.2	21.6	3,715
2016	33.5	18.3	11.8	10.9	2.3	2.9	20.2	5,691
2017	28.5	15.6	9.5	8.1	1.9	1.7	34.8	10,247
2018	34.1	17.4	8.1	7.5	1.9	1.4	29.4	13,253

Table 11: Percentages of Licensing Patterns of the Top 25 Publishers

	CC by-nc-nd	CC by	CC by-nc-sa	CC by-nc	CC by-sa	CC by-nd	N/A	Total
Frontiers Media SA	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1,168
De Gruyter	93.9	1.4	0.2	0.0	0.1	0.5	3.9	957
MDPI - Multidisciplinary Digital Publishing Institute	84.5	14.3	0.0	0.0	0.0	0.0	1.3	624
Presses universitaires de Rennes	0.0	0.0	0.0	0.0	0.0	0.0	100.0	528
ANU Press	0.0	0.0	0.2	0.0	0.0	0.0	99.8	512
Springer	0.7	45.4	0.2	51.8	0.0	0.0	1.8	436
Amsterdam University Press	45.2	0.3	0.0	52.3	0.0	0.3	1.9	321
Universitätsverlag Göttingen	10.5	0.6	0.0	0.0	39.6	48.6	0.6	313
Brill	18.7	0.0	0.0	71.3	0.0	0.0	10.0	251
transcript Verlag	91.4	4.9	0.0	0.4	2.0	1.2	0.0	244
Böhlau	65.1	18.5	0.0	16.4	0.0	0.0	0.0	238
punctum books	0.0	0.0	100.0	0.0	0.0	0.0	0.0	204
SciELO Books - Editora UNESP	0.0	4.9	54.3	2.7	0.0	0.0	38.0	184
SciELO Books - Editora FIOCRUZ	0.0	27.6	49.2	2.2	0.0	0.0	21.0	181
Bloomsbury Academic	91.5	0.0	0.0	7.9	0.0	0.0	0.6	177
Open Book Publishers	31.4	64.6	0.0	0.6	1.1	0.6	1.7	175
Manchester University Press	84.5	0.6	0.0	7.5	0.0	0.0	7.5	174
Ledizioni - LediPublishing	8.6	0.7	88.2	0.0	2.6	0.0	0.0	152
Graduate Institute Publications	100.0	0.0	0.0	0.0	0.0	0.0	0.0	147
Palgrave Macmillan	7.0	69.9	0.0	1.4	0.0	0.0	21.7	143
Collège de France	0.0	0.0	0.0	0.0	0.0	0.0	100.0	142
Athabasca University Press	99.3	0.0	0.7	0.0	0.0	0.0	0.0	134
Leuven University Press	1.5	0.0	98.5	0.0	0.0	0.0	0.0	130
Presses de l'Ifpo	0.0	0.0	0.0	0.0	0.0	0.0	100.0	127
Institut français d'études andines	0.0	0.0	0.0	0.0	0.0	0.0	100.0	124
Other	33.3	9.3	7.7	6.3	2.2	0.5	40.7	5,467
Total	4,522	2,312	1,080	997	254	188	3,900	13,253

5. Conclusions

In the present paper, the bibliographic information of OA books available through the DOAB was investigated. The chronological changes in the number of titles and the distribution of subjects, languages, publishers, publication/add-on years, licensing patterns, etc., were clarified. The results showed that OA books were increasing at an accelerating rate, although the speed at 2018 slightly decreased. As for the distribution of subjects, Science (“Q”), Social Sciences (“H”), and Political Science (“J”) were the most popular. With regard to languages, English, French, German, Portuguese, and Spanish were the most common. As for the publishers, Frontiers Media SA, De Gruyter, MDPI - Multidisciplinary Digital Publishing Institute, Presses universitaires de Rennes and ANU Press had registered more books in the DOAB than any other publishers. As for the licensing patterns, “CC by-nc-nd” and “CC by” were the most popular. Considering these tendencies, libraries should begin to utilize OA books by, for instance, providing them as part of their collections.

As future research, we would like to investigate (1) the distribution of the levels of OA books (e.g., identifying how many books are suitable as textbooks for undergraduate students, how many are for expert researchers, and in which subjects) and (2) the business models adopted for each OA book (e.g., identifying who paid to publish it). Through these studies, better ways of utilizing and producing OA books will be clarified.

NOTES

- 1) For instance, Adema (2012) stated that, prior to the user needs analysis of OA books, online discussion of OA books took place among publishers, academics, librarians, and participants from the wider OA and publishing community. The discussion included the definition of OA books, but Adema did not report any conclusion regarding this definition.
- 2) <https://www.doabooks.org/doab?func=search&uiLanguage=en>
- 3) <https://www.doabooks.org/doab?func=about&uiLanguage=en>
- 4) <https://www.loc.gov/catdir/cpsolcco/>

- 5) Some figures in Table 4 correspond to the same titles. For instance, if a particular book has been published in English, French, and German, these editions were counted as three independent books written in English, French, and German. This is why the “Total” in Table 4 is 13,394, which is larger than 13,253 in Table 2.
- 6) “by,” “nc,” “nd,” and “sa” represent forms of Creative Commons licenses: “by” (you must give appropriate credit, provide a link to the license, and indicate if changes were made; you may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use); “Non Commercial” or “nc” (you may not use the material for commercial purposes); “No Derivatives” or “nd” (if you remix, transform, or build upon the material, you may not distribute the modified material); and “Share Alike” or “sa” (if you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original), respectively. <<https://creativecommons.org/licenses/>>

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