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A Crisis in "Open Access": Should Communication Scholarly Outputs Take 77 Years to Become Open Access?

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Abstract

This study diachronically investigates the trend of the "open access" in the Web of Science (WoS) category of "communication." To evaluate the trend, data were collected from 184 categories of WoS from 1980 to 2017. A total of 87,997,893 documents were obtained, of which 95,304 (0.10%) were in the category of "communication." In average, 4.24% of the documents in all 184 categories were open access. While in communication, it was 3.29%, which ranked communication 116 out of 184. An Open Access Index (OAI) was developed to predict the trend of open access in communication. Based on the OAI, communication needs 77 years to fully reach open access, which undeniably can be considered as "crisis in scientific publishing" in this field. Given this stunning information, it is the time for a global call for "open access" by communication scholars across the world. Future research should investigate whether the current business models of publications in communication scholarships are encouraging open access or pose unnecessary restrictions on knowledge development.

Keywords

communication, open access, WSIS, UNESCO, Budapest Open Access Initiative, business model of publishing, Open Access Index (OAI)

Introduction

From the beginning of this century, the traditional model of science communication has undergone profound changes, especially after Budapest Open Access Initiative (BOAI) in January 2002. The BOAI, often seen as the origin of the Open Access (OA) movement (Wenzler, 2017), set out the principles, strategies, rules, and commitments related to OA to research literature (Miguel, de Oliveira, & Gracio, 2016). Some scholars believe that the BOAI and other similar initiatives, such as Berlin (Max Planck Institute for the History of Science, 2003) and Bethesda (Earlham College, 2003), were a result of "crisis in scientific publishing." Such a crisis occurs as a consequence of high prices for subscriptions, reduction of libraries' budgets, and other restrictions on access to scientific publications for the scientific community (Miguel et al., 2016).

Recently produced science and knowledge should be accessible to all citizens equally, particularly when considering "Free Access" at the core of OA movement and related initiatives. In fact, OA publications should pose no barrier to a reader other than having access to the Internet (Forrester, 2015). OA does not mean just being free to download. According to Sahu (2005), OA means free availability on the public Internet, permitting any user to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself. The only acceptable conditions that should be considered within the framework of OA is giving authors both control over the integrity of their

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work and the right to be properly acknowledged and cited (Miguel et al., 2016).

Since 2002, the OA movement, especially with the introduction of gold, green, and hybrid roads (Rizor & Holley, 2014), has become a new trend in scholarly outputs. Some journals in different fields of study started shifting toward seeing OA as an advantage; nevertheless, the volume of OA documents available is still low. Many journals are displeased with this movement, to the extent that the percentage of OA documents in journals included in the Web of Science (WoS) and Scopus is barely 23% on the two gold and green roads (Björk, Laakso, Welling, & Paetau, 2014).

This study is dedicated to, first, find the volume of "open access" documents in the WoS categories in general and, second, investigate the directions and trends of OA within the study field of "communication." "Communication" was selected as the specific category due to its rich and old history of intensive debates on the issue of "Open and Free Access," which by default put "communication" scientific productions as top priority that "Must and Should" be OA.

The Debate Over "Free Access" in Communication

The recent movement for OA and other related initiatives are not completely new in communication scholarship. The two basic issues of "free flow of information" and "free access to information and knowledge" have been discussion topics for many decades in "communication," and repetitiously emphasized in several universal constitutions, including the Universal Declaration of Human Right and United Nations Educational, Scientific and Cultural Organization's (UNESCO) related documents (Ghanbari Baghestan & Hassan, 2009). In this regard, three major phases can be highlighted, wherein all the issues of "free access to information and knowledge" are at the core.

First, the "free flow of information" was the subject of intense debates at both national and international forums beginning in the early 1940s. In 1948, the United Nation General Assembly adopted the Universal Declaration of Human Right, of which Article 19 explicitly recognized free expression as a fundamental human right. This right, among others, includes the freedom to hold opinion without interference and to seek, receive, and impart information and ideas through any media regardless of frontiers (Cate, 1989). As it is also highlighted in First Amendment to the U.S. Constitution, this Article not only recognizes the free flow of information, but goes further to guarantee reception of the information. The meaning of this extension is very significant to communication as a field (Cate, 1989). Second, in the early 1960s, UNESCO becomes the forum for debate on this issue. The MacBride Commission is one of the groups assigned the awesome task of studying the totality of this issue in modern societies (Raube-Wilson, 1986). It is worth highlighting that the McBride report addresses multiple matters, among them "democratization of communication," insisting on removal of all communication obstacles. Although, due to consequence of the free flow of information, the world was divided both along an East-West and North-South axis, UNESCO managed to take initiatives that continue to characterize it today. Third, with the rise of Internet in the later decades of the last century, the International Telecommunication Union (ITU) passed a resolution in 1998 proposing the idea of a World Summit on Information Society (WSIS), under the auspice of the United Nations. The WSIS was held in Geneva in 2003 (first phase) and in Tunis in 2005 (second phase), and presented the Geneva Declaration of Principles (ITU, 2003a), Geneva Plan of Action (ITU, 2003b), the Tunis Commitment (ITU, 2005b), and the Tunis Agenda (ITU, 2005a) for governance of the Internet and the flow of information and knowledge, respectively. The Geneva Declaration of Principles in 2003 is one of the major outcomes of the WSIS summit merit, with special attention on the provision of access to information and knowledge for the whole population (Weber, 2010).

Considering the above background and history, it was highly expected that "communication," as a field and because of its nature, will lead the OA movement and related initiatives, particularly in the world of scientific productions. However, after more than eight decades of intense debates regarding "Free Access," five decades indexing scientific journals (Garfield, 1964), and 15 years of OA Movement, it is of importance to evaluate the volume of OA in "communication" itself to find whether there is a "crisis" in access to the scientific publications (Miguel et al., 2016) in this field. In other words, in the context of realizing greater OA to communication scholarly literatures, how much progress has been achieved in the field of communication scholarship? Is it acceptable or not?

Method

To evaluate the trends and directions of free accessibility to the scientific productions in communication, a bibliometric study was conducted. Bibliometric is defined as "a set of methods to quantitatively analyse academic literature and scholarly communications" (Das, 2015). There are multiple papers that have used bibliometrics in the fields of social science (Farahmand, Mariani, Ghanbari Baghestan, Ebrahim, & Matinnia, 2018; Ingwersen, 2000; Kalantari et al., 2017; Riazi et al., 2019) and communication (Gonzalez & Guarinos, 2017) to measure scientific progress. Bibliometrics is an essential aspect of measuring academic and organization performance based on various indices, including the number of publications, number of citations, and average citations per year (Davidson et al., 2014; Farahmand et al., 2018; Etemadifard, Khaniki, Ghanbari Baghestan, & Mehrnoosh, 2018). Web-based citation databases like Scopus and the WoS are frequently used for deriving bibliometric data (Das, 2015). The WoS is the most appropriate powerful, large, and

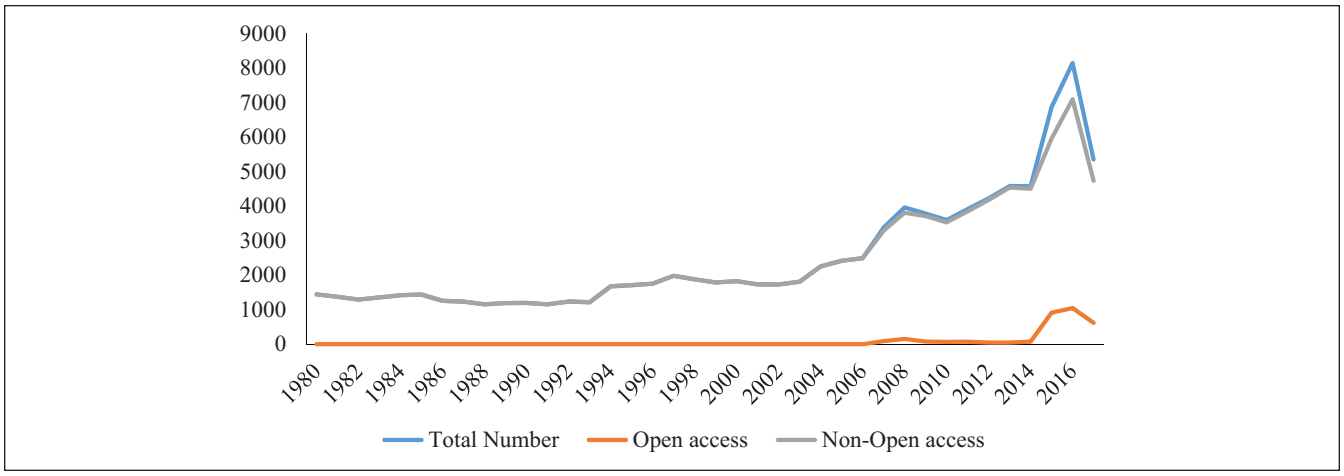

Figure 1. Trends of publications in the Web of Science category: Communication 1980-2017.

trustworthy database for literature retrieval and analysis (Aghaei Chadegani et al., 2013; Gal, Glanzel, & Sipido, 2017; Meho & Rogers, 2008).

Data were collected from the WoS Core Collection based on a category search of "communication" on December 1, 2017. The WoS was selected for two main reasons. First, it has more precise coverage in the category of communication, and second, it covers the top prestigious journals highly expected to be OA. The WoS Core Collection consists of six databases—Science Citation Index Expanded (SCI-Expanded), Social Science Citation Index (SSCI), Art & Humanities Citation Index (A&HCI), Conference Proceeding Citation Index Science (CPCI-S), Conference Proceeding Citation Index Social Science & Humanities (CPCI-SSH), and Emerging Sources Citation Index (ESCI). The WoS included conference proceedings from 2004 and ESCI from 2015 in their databases. The time span was 1980 to the data collection date.

To evaluate the rank of communication category documents within all existed categories in the WoS Core Collection, the number of total published documents and the portion of OA documents were extracted for all 184 categories of the WoS Core Collection. The data search was repeated for each year from 1980 to 2017. The total publications and OA availability were checked and recorded in a Microsoft Excel sheet for each year separately. To assess the differences between OA and non-OA, publications were sorted in terms of type of documents, country, and languages of all collected data, and were integrated in a dataset. The country, document type, and language of the all documents were collected yearly from 2007 (the year in which first series of OA documents were available in the category of communication) till 2017. Frequency analysis and chi-square tests were used to find any correlation between the country, document type, language, and OA trends. Finally, an equation was developed to predict the trend of OA in communication (called OAI).

Results and Discussion

Of the 87,997,893 documents which were obtained from all 184 categories of the WoS Core collection, 84,274,416 (95.76%) were non-OA and 3,723,504 (4.24%) were OA. Out of the total number of documents analyzed, 95,304 (0.10%) documents were in the communication category, and surprisingly, only 3,142 (3.29%) of them were indexed as OA documents, which is 0.95% less than the average among others. These figures ranked communication at 142 and 116 of 184 in scientific productions and in OA, respectively.

OA Trend in Communication

According to the results, before 2006, there were no OA documents in the category of communication, based on WoS database (Figure 1). Although the first OA publication appeared in the year 2006, there was no significant growth in free accessibility to scientific publications from 2006 to 2014. A slightly positive growth is seen in the last 2 years, 2015 and 2016.

Comparison Between OA and Non-OA Based on Type of Documents

To evaluate the differences between OA and non-OA publications in terms of type of document from 2007 till 2017, a chi-square test was performed to compare the pattern between OA and non-OA. Figure 2 shows the results of the statistical analysis of OA and non-OA based on the type of document. The results show that there was a significant difference between these OA and non-OA regarding the pattern of document, as seen in Table 1. Relatively, OA is more prevalent in "Book Reviews," "Editorial Materials," and "Reviews," whereas non-OA is more prevalent in "Articles" and "Proceeding Papers."

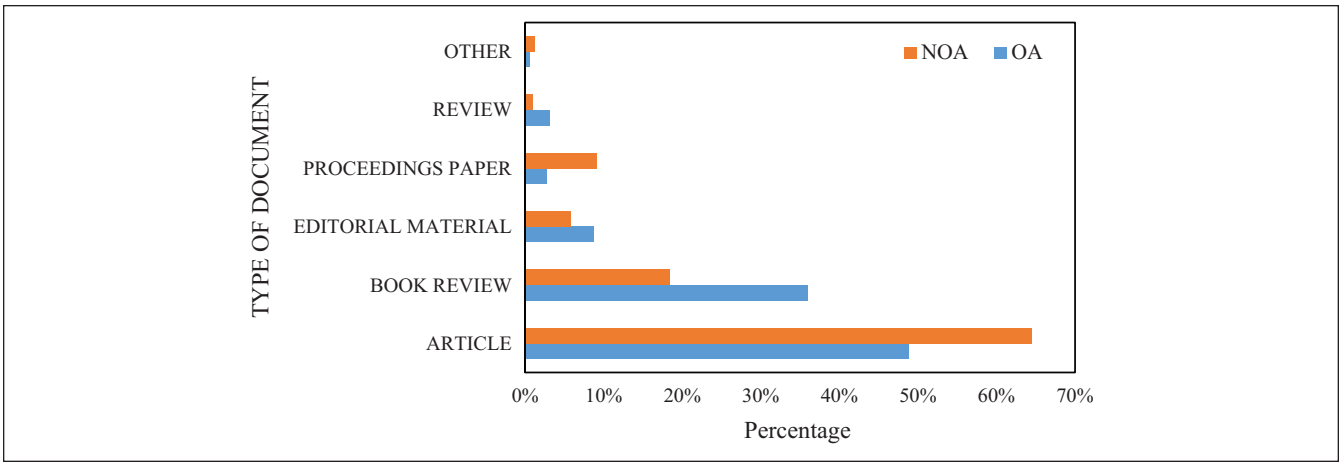

Figure 2. OA and non-OA based on type of documents.
Note. OA = open access.

Table 1. Comparison Between OA and Non-OA Documents Based on Type of Documents.

	Type of publication			
Type of documents	OA	Non-OA	χ^2	*p* value
Article	1,558 (48.8%)	32,187 (64.5%)	923.442	<.001
Book review	1,151 (36.0%)	9,176 (18.4%)		
Editorial material	279 (8.7%)	2,894 (5.8%)		
Other	20 (0.6%)	593 (1.2%)		
Proceedings paper	85 (2.7%)	4,552 (9.1%)		
Review	100 (3.1%)	476 (1.0%)		
Total Count	3,193 (100%)	49,878 (100%)		

Note. OA = open access.

Top 20 Countries for OA Publication From 2007 to 2017

The total number of OA from 2007 to 2017 was investigated by country. The results for top 20 countries, as summarized in Table 2, show that these 20 countries contributed 92% to OA within 2007 to 2017. The United States had the highest number of OA documents (n = 2,067), which was 45.16% of the total OA publication in this period, followed by Spain with 19.29% (n = 883), Brazil with 4% (n = 183), Argentina with 2.77% (n = 127), and England with 2.38 % (n = 109). Among the top 10 countries, the majority were South American countries. Only one country from Asia, South Korea, emerged among the top 10, with 1.46 % (n = 67).

Comparison Between OA and Non-OA Based on Languages

Language was categorized into three groups: English, Spanish, and other languages, according to the high frequency languages in both OA and non-OA publications. Chi-square test was used to compare the pattern of languages between OA and non-OA. Figure 3 shows results of the analysis. The results indicate that there was a significant difference between OA and non-OA regarding the languages. As can be seen in Table 3, the frequency of Spanish publications was higher in OA publication than in non-OA while a majority of the publications were in English in the non-OA, suggesting that the English language dominates the non-OA publications while the Spanish language dominates the OA publication from 2007 to 2017.

Open Access Index (OAI)

To evaluate the situation of OA "communication" publications in different years, a new index was created, called the OAI. It is a ratio of OA publications to total publications. This index was applied to evaluate the trend of OA growth.

$$\text{OAI (Open Access Index)} = \frac{\text{Total number of open access documents}}{\text{Total number of published documents}}.$$

Table 2. Top 20 Countries for OA Publications from 2007 to 2017.

	Minimum	Maximum	Sum	% OA
United States	2	1,577	2,067	45.16
Spain	0	428	883	19.29
Brazil	1	70	183	4.00
Argentina	1	48	127	2.77
England	2	46	109	2.38
Mexico	1	40	107	2.34
Colombia	1	28	83	1.81
Canada	1	51	79	1.73
Chile	2	25	77	1.68
South Korea	1	27	67	1.46
Ecuador	1	32	60	1.31
Australia	1	21	51	1.11
Germany	1	20	51	1.11
Malaysia[a]	—	—	50	1.09
Portugal	1	11	47	1.03
Italy	1	13	40	0.87
Sweden	1	22	40	0.87
France	1	15	36	0.79
Finland	1	10	29	0.63
Denmark	1	13	28	0.61

Note. OA = open access.
[a]Malaysia only had 1 year (2017).

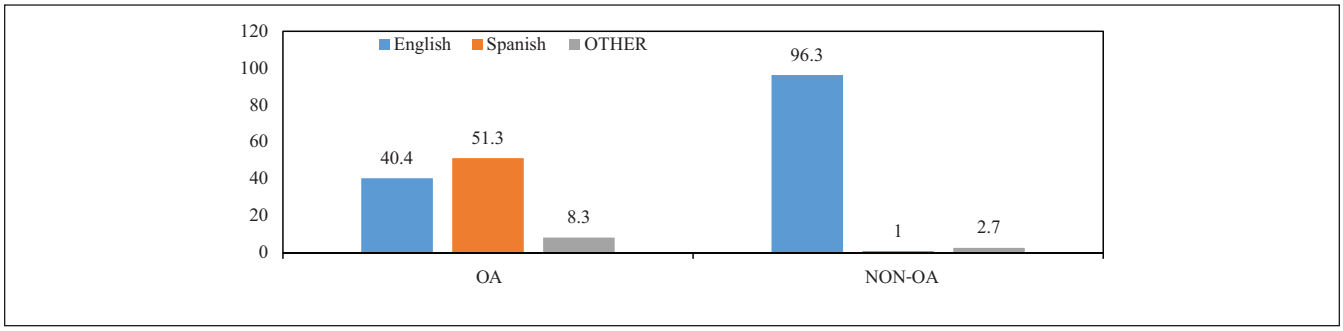

Figure 3. OA and non-OA based on languages.
Note. OA = open access.

Table 3. Comparison Between OA and Non-OA Documents Based on Languages.

	Type of publication			
Language	OA	Non-OA	χ^2	*p* value
English	1,291 (40.4%)	47,446 (96.3%)	1,989.59	<.001
Spanish	16,385 (51.3%)	503 (1.0%)		
Other	265 (8.3%)	1,317 (2.7%)		
Total count	3,194 (100%)	49,266 (100%)		

Note. OA = open access.

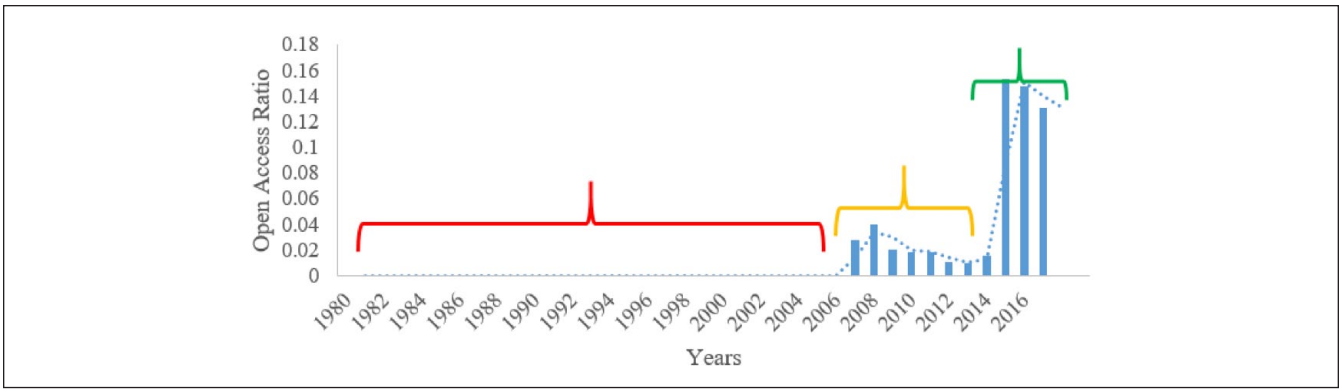

Figure 4. Comparing the OAI at three phases from 1980 to 2017.
Note. OAI = Open Access Index.

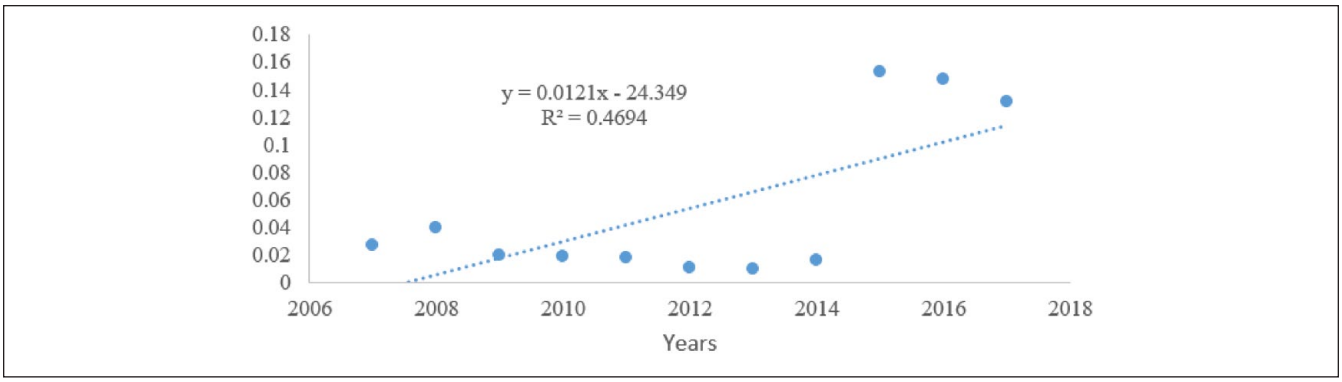

Figure 5. Trend of OAI during 1980 to 2017.
Note. OAI = Open Access Index.

According to the results, three phases of OA development in communication can be detected. The first phase, inactive phase, is before 2006. In this phase, there were not any available OA documents in the WoS category of communication. The second phase started in 2007 and continued to 2014, and the OAI was almost at 2% of total documents. The third phase, considered the developing stage, started in 2015, with an average of 14.5% OAI (Figure 4).

A simple regression method was used to evaluate the growth rate of OA based on the available data (Figure 5). The results showed a positive slope between OAI and years with a moderate R^2 value (.46) for the regression line. Using this equation, OA communication publications are expected to reach 100% OA by 2094, if following the current trend.

Conclusion

Much is left to be desired in OA communication development. Although the "communication" scholarly outputs consist of a very small portion of the total outputs in all 184 categories in WoS, its degree of "accessibility" is much less than average, ranked at 116 of 184. This rank, doubtless, is not acceptable for communication as field. Considering the huge history of debates and efforts being made to protect the right of "free accessibility" to information and knowledge in this field, as well as BOAI recent movements for "accessibility" of scholarly outputs, no reason can be found to justify such result and rank. When it comes to prediction of the future trend, surprisingly, the proposed equation for OAI shows that with the current trend in communication, it will take 77 years until "communication," as a field of study, can reach the goal of being fully OA. Again, undeniably, it can be considered as "crisis in scientific publishing" as mentioned by Miguel et al. (2016).

Given this stunning information, it is the time for a global call for "open access" by communication scholars across the world. Even prior to this, there should be further investigation on the epistemological and ontological aspect of such trends to find a solution to accelerate the "open access" movement in communication. Further research also might focus on the current "business models" of publishing in this area. It is important to evaluate whether the current business models of publishing are really encouraging "Open Access" or pose unnecessary restrictions (due to publication fees/subscription fees) on knowledge development and participation of some segments of the world's class scholars, like those in developing and less developed countries.

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