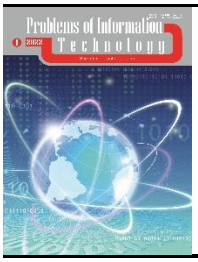

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Journalology – academic publishing process

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ABSTRACT

In the paper, we provide information about journalology - as the science of publication, and its history. We give brief information on metascience, open science, scientometrics and bibliometrics related to journalism. Journalology includes identifying predatory journals and publishers, choosing the right journal for publication, and generally producing qualitative articles. The establishment of Journalology Center in every higher education and research institute has been suggested to inoculate this knowledge in students and young researchers. The center also includes rules for publishing qualitative journals. This creates opportunities for journals to be indexed in international academic databases.

1. Introduction

The term journalology was first coined in 1928 by Charles D. Johnson to change the name of the journalism department at every university in the United States (Johnson, 1928). He notes in his article that "journalism" is the name of the profession, "journalist" is the name of the person who master this profession. He suggests in his article to call the teachers and professors involved in he teaching process "journalologist" and the faculty as "journalology".

Journalology is now recognized as a scientific field that studies all aspects of the academic publishing process. Here, researchers learn how to choose the right journal for publication and the key points for publishing a quality journal.

Stephen P. Locke, who devoted 26 years of his life (16 years as editor-in-chief) to the British Medical Journal (BMJ) (published since 1840) is considered one of the most influential scholars in the peer review process. He estimated that the number of scientific journals published in 1989 was 100,000, of which 20,000 to 25,000 referred to the field of biomedicine. The study found that more than 15,000 biomedical journals were considered "serious."

Thus, the sharp increase in the number of journals, called the ''explosion'' in science, is in fact a dream. Since the publication of the first scientific journal in 1665, the growth of journals has been 5-7% per year, and this growth has remained stable to this day. Certainly, the correlation between the number of journals and the number of researchers united around these journals remains relatively stable. This regularity is reflected in the 1975 book by John Price on the study of science history (Price, 1961).

These studies are based on unpublished research by Edward J. Hurt, the editor of "Annals of Internal Medicine" journal (This journal has been published since 1927). Comparing the number of journals and the number of researchers who have gathered around them for 30 years, he discovers a constant pattern that each of the 17 journals gathers around 1,000 individuals (Lock, 1989). According to Price's "Basic rule" (rule of thumb) a scientist publishing an article a year studies the content of an article at least once a month and at most once a day. This means that several hundred people support each other in the science business. In addition, every field of science has a tendency to be divided every 10 years, that is, to be grouped into sub-fields. And, of course, there is a need to publish new journals to deliver new knowledge to the public. This establishes a hierarchy of journals. This process is not static, it changes according to the needs of readers and the philosophy of time.

For example, Locke sees BMJ as becoming more general, and considers it expedient to publish articles in new, restricted journals (emerging as a new sub-field) that address challenges. Comparing the articles published in this journal with the articles published 30-40 years ago, he concludes that more original articles and fewer editor articles used to be published in the journal, however, now, on the contrary, more peer-reviewed articles, editor articles, notes, personal experiences, and etc. are published.

In 1990, Eugene Garfield highly appreciated Locke's experience in Current Comments and called him an excellent professor of journalology, i.e., journalologist (Garfield, 1990). Garfield praises the fact that he retired at that time and started teaching journalology. Over the past 20 years, Lock has organized 100 courses on how to identify fake journals and how to properly organize the reviewing process. In his article, Garfield notes that he considers the science of journalology a neologism and it is widely used in human activity. He is concerned about the lack of courses in journalology training centers, and in his article, he emphasizes the importance of including journalology into the curriculum and textbooks' preparation.

The most important point in the publishing process of an article for potential authors is the peer review process. In the first journals published by the Royal Society in England and The Academie Francais (17th century), the peer review process consisted of deciding whether an article should be published or not (Lock, 1985). However, Burnham J.C. showed that editorial review was not used in the publication of articles in medical journals until the end of World War II (Burnham, 1990). In the 19th century, editors of medical journals were anxious about another issue. First, their journals were their own property, and they used them to run various campaigns and convince people. Second and most importantly, many journals were looking for articles to publish, and most of the published articles did not need peer review process. Like other journals, BMJ published non-reviewed articles, reports, and so on.

Nevertheless, Ernest Hart, the editor-in-chief of BMJ from 1867 to 1898, supported the peer review process. Burnham wrote: "Every letter received by the editorial office, each editor article, every paragraph is evaluated by experts with special knowledge in the field" (Hart, 1893).

2. The process of selecting articles for BMJ journal

In the 1990s, BMJ involved 2,000 referees, and detailed information about each of their specialties, interests, and work experience was available on a computer. Unlike restricted journals, BMJ reviewed only half of the articles, not all of them. This was due

to the fact that this journal had full-time editors who conducted the initial evaluation of submitted articles. Articles that were not original or corresponded to restricted journals were rejected. All articles were first read by the BMJ editor, who then sent them either to the referee (if he thinks the article is acceptable) or to another editor (if he thinks the article will be rejected). Here, the referee was asked about the originality of the research, its representation of scientific truth, its medical significance, and whether it complies with the journal's scope in general. Depending on the editorial review, the article was either rejected or submitted to a weekly "jury". The jury consisted of 3 editors, 2 or 3 assistant (junior) editors. Typically, one statistician also participated in these meetings, and the articles of medical interest were subject to statistical peer review (Hart, 1893).

In 1893, Hart identified several critical remarks aimed at an expert evaluation: "It is a difficult method that requires a great deal of labor and daily correspondence and constant vigilance to protect oneself from prejudice and unjust condemnation" (Hart, 1893). Vigilance is based on recommendations that we should give to referees about what we want from them, which in turn is related to creating feedback in the form of appeals to the authors.''

Hart's "bias" is the most difficult criticism to deny. Because many journalologists support the referee not to be aware of the author's identity. They believe that, in this case, the referees can make fairer decision. However, whether blind or non-blind peer review is better is still a matter of argument among scholars in this field.

3. IMRAD format

The structure of the article is also important in the field of journalology. After the 1940s, articles began to be structures in the popular IMRAD format. According to this format, the main part of the article should consist of an introduction, methods, conclusion and decision. Currently, this format is a universally accepted convention for authors. Bradford Hill believes that each section of the article's main body should answer 4 questions: why do you start this research (introduction); What do you do? (methods); What do you get? (conclusion); What does this mean? (decision) (Hill, 1965). Medawar criticized this model, considering that it is impossible to present science with the IMRAD structure (Medawar, 1965). Despite Medawar's disparagement, the IMRAD structure is considered an understanding between the author and the reader. Writing an article about science in an understandable format requires the author to be able to work with literature. The IMRAD structure indicates that the study is planned and allows for better results. Some journalologists believe that if the main issue is addressed in an article, it should be published, regardless of its structure (Altman, 1982, Mahoney, 1977). A good summary should also cover the full content of the article and give a brief answer to Bradford Hill's 4 questions. However, even if the summary contains answers to these questions, it cannot be evaluated by the reader if they are not presented in an appropriate structure. A structured summary prevents this shortcoming by presenting the necessary information correctly (Lock, 1988).

The author, editor, publisher and reader determine whether the journal selected for publication is correct or not. Although the first three of them positively answered to the question of whether the journal is proper or not, the readers often give a negative answer. This is due to the fact that the author publishes a scientific article, finds an article for the editor's journal, and the publishing house earns money from it. The reader is dissatisfied if he/she cannot get the information he/she needs from the article (Riis, 1992).

In general, P. Riis according believes that a good scientific article must meet the following requirements: originality, reliability, clarity and intellectual consistency (Riis, 1992).

The first international congress on biomedical publications was held in Chicago, Illinois in 1989 and is held regularly (8 congresses in total). The main issue here was the reorganization of the peer-review process in journals. Journalology, representing the main points of this process, was considered a separate field of science. The idea that a quality article should be published in a quality journal was at the forefront of the discussions.

The 9th International Congress on Peer Review and Scientific Publication is scheduled for September 8-10, 2022 in Chicago to improve the

quality and reliability of science.

The first conference for editors was held on October 1-4, 2015 in New Delhi, India.

The Centre for Journalology at the Hospital Research Institute (OHRI) is managed by Dr. David Moher. The number of staff is 16. The Centre collaborates with EQUATOR Network and COPE (Committee on Publication Ethics). Here, research is conducted in three spheres: Predatory journals; Reporting Guidelines; Researcher Assessment.

4. The scope of journalology

Generally, journalology is directly related to the following areas: Journal ranking (SCImago Journal Rank, SCOPUS), MEDLINE, Metascience, Open science, Predatory publishing (Beall's List, Cabell's blacklist), Bibliometrics, Scientometrics.

The SCImago Journal & Country Rank is a portal representing the scientific indicators of journals and countries registered in the Scopus database (Elsevier). These indicators can be used in the analysis and evaluation of science.

The SCImago Journal & Country Rank portal is named after the SCImago Journal Rank (SJR) indicator. SJR was developed by SCImago using the popular *Google PageRank* algorithm.

This rating system compiles the ranking tables of journals and countries by fields and regions.

Scopus is the most spectacular abstracting and indexing database of scientific literature in the world. This database offers the researcher to find the necessary information out of millions of articles and theses. Scopus is characterized by quick, easy and comprehensive search capabilities in the process of the scientific literature research. Smart tools track, analyze, and visualize research areas, journals, authors, and organizations. It also uses bibliometric indicators such as SJR and SNIP to evaluate journals.

Scopus enables the researcher to find, track and analyze the information they need. It also has a comprehensive view of all areas of research, such as science, technology, medicine, social sciences, arts and humanities throughout the world.

Scopus database is daily updated and contains 21,000 titles from more than 5,000 international publishers. It includes 20,000 periodicals (2,600 of which are available), 390 trade publications, 370 books, and 5.5 million conference proceedings.

MEDLINE is the main bibliographic database of the US National Library of Medicine. The database contains more than 27 million references to journal articles (in the field of life sciences and biomedicine). These references cover more than 5,200 journals in about 40 languages. MEDLINE is a key component of PubMed search engine.

Metascience, also known as meta-research, is called research on research, science of science, science through the "bird vision". The evaluation area of this sphere includes the organization of the peer review system (pre-publication peer review, post-publication peer review and open peer review). The increase in the number and diversity of scientific organizations requires empirical data on the research process. Thus, based on this data, it is possible to evaluate and apply the research. The research itself is more effective and the results are more reliable. Meta-research is a constantly evolving scientific field that aims to evaluate and improve research practices. This includes thematic methods, reporting, reproducibility, evaluation and incentives. (how to conduct, report, check, correct, and expand scientific research) (Ionnidis, Fanelli, Dunne, Goodman, 2015).

Open science is used to name various activities to overcome obstacles in the production and exchange of scientific knowledge. This includes open access, open data, free software, open peer review process, crowdfunding and etc. In early 21st century, Science 2.0 and e-Science were used to describe the impact of the Internet on the production and dissemination of scientific knowledge. In 2014, the term "open science" was recognized by everyone. (Burgelman et al., 2019).

"Predatory" publisher publishes one or more "predatory" journals. When analyzing suspicious journals as predators, Jeffrey Beall finds out that several predatory journals are published by the same publisher. This type of publishing house does not include any information about the editor-in-chief, editorial staff, referees. (for example, the name of the organization, contact numbers, office addresses, etc.) Despite the fact that the published journals are called international (for example, *International Journal Advances in Social Science and Humanities*), almost no geographical differences are

followed among the members of the editorial board. Claiming that their content is indexed in international academic databases, they list several Internet resources as indexing databases (for example, the *Google Scholar* search engine). The presence of these or other signs indicates the publisher to be a predator (Beall, 2016, Alguliyev et al., 2020).

Bibliometrics is a set of methods used to measure text and information (Hertzel, 1987). These methods are commonly used in citation analysis and content analysis. Although bibliometric methods are mostly used in the field of library and information science, they can be widely used in other fields. Many research fields use bibliometric methods to assess the impact of a group of researchers or a single article.

The term bibliometrics was first coined in 1969 by English scholar Alan Pritchard to evaluate books, periodicals and etc. by applying mathematical and statistical methods. The study of a large number of scientific documents is a complex of quantitative methods. In this approach, information about publications located in different databases is often used in the study of science. Bibliometrics is a view to science from the "bird flight height". It is used to assess the "hot spots" or "fronts", "social geography" of science, the value of scientific information and scientific productivity of scientists. At the same time, they try to use these indicators as a social tool in the management of science (Pritchard, 1981).

Scientometrics is a field of science that measures and analyzes scientific information. Scientific information is logically organized information obtained during the process of scientific understanding of the laws and phenomena of nature, society and thought. (Alguliyev et al., 2013).

In scientometrics the "research front" is a collection of all current scientific publications and research papers. The concept of "research front" is often compared to the "research core", i.e., a set of knowledge truly and reliably recognized by the scientific community.

John Price, a doctor of physical sciences from the University of London and a doctor of science history from Raffles College, is the first to conduct scientometric research and is known as the "father of scientometrics". He wrote the article a "living tissue of science" and described all the nuances that can be evaluated in texts for scientometrics, i.e., the number and subject of publications, the award for solving a problem, bibliographic references, the volume of the text, etc. (Price, 1951). Scientometrics itself is closely related to evaluation theory. Here, 2 types of variables are used:

a) Parameters desired to be evaluated: scientist's productivity, etc. These variables are called unmeasurable variables.

b) Parameters that can be directly evaluated: number of articles, scientific references, etc. These parameters are called indicators.

John Price also introduces the half-life of scientific literature and law of exponential growth of science (Price's law) (Price, 1951). In his famous article, Networks of scientific papers, he focuses on the relationship between researchers based on references to each other's articles (Price, 1965).

According to the law of exponential growth of science, productivity is unevenly distributed in many fields of science, and each parameter of science (number of researchers, number of articles, etc.) doubles in a certain time interval. For example, Price estimates the number of researchers and scientific articles to double every 10-15 years. This pattern has remained unchanged for 2-3 centuries. Such regularity is observed only in large fields of science, such as physics, chemistry, and biology. For restricted disciplines, exponential growth dependence is replaced by a linear dependence. One of Price's most significant works is Little Science, Big Science, written in 1963 and the foundation of modern scientometrics. (Price, 1963).

Scientometrics uses many scientometric and webometric indicators to evaluate the researcher's scientific activity, scientific journal, university and country rating. For example, the number of articles and references for a researcher (Hirsch index), the number of references to articles published in a journal (impact factor), many academic indicators for the organization (number of foreign students and teachers, number of Nobel and Filds winners, etc.) the country's contributions to world science (activity or attraction indices) are calculated. (Alguliyev et al., 2013).

5. Conclusion

Students and young researchers often find it difficult to produce quality articles, choose the right journal for publication, and sometimes even fall into the trap of predatory journals and publishers.

Along with students and young researchers, journal editors and publishers also face some challenges. These problems include non-compliance of the journal with international requirements, for example, inclusion in misleading metrics, non-compliance with publishing ethics, improper organization of editorial board, etc.

The training of journalology, which represents the solution of existing problems in the academic environment, can provide students and young researchers with the necessary knowledge in this field. Courses for editors and publishers in this field can share best practices in publishing quality journals. This, in turn, could allow these journals to be indexed in international academic databases.

International experience shows that in some countries such services are already provided to users in the Journalology Centers. The establishment of the Journalology Center in Azerbaijan can be considered one of the most vital issues, since the activities of this center will significantly increase the country's academic performance.

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