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Aims and scope

Science Editing (Sci Ed) is the official journal of the Korean Council of Science Editors (https://kcse.org) and Council of Asian Science Editors (https://asianeditor.org). It aims to improve the culture and health of human being by promoting the quality of editing and publishing scientific, technical, and medical journals. Expected readers are editors, publishers, reviewers, and authors of the journals around the world; however, especially focused to those in Asia. Since scholarly journals in Asia are mostly published by the academic societies, universities, or non-profit organizations, Sci Ed is sought to play a role in journal development. The number of publications from Asia is increasing rapidly and overpass that of other continents; meanwhile, the number of international journals and highly appreciated journals is yet to be coming forward. It is in task of Asian editors to pledge the journal quality and broaden the visibility and accessibility. Therefore, its scope includes the followings in the field of science, technology, and medicine.

• Policy of journal editing
• Data mining on the editing and publishing
• Systematic review on medical journal publishing and editing
• Research ethics and medical ethics including clinical registration, statement of human and animal health protection, and conflict of interest
• Publication ethics: fabrication, falsification, plagiarism, duplicate publication, and authorship
• CrossRef
• Legal issue in journal publishing
• Peer review process
• Reporting guideline for medical journals
• Medical and scientific literature databases
• Advanced information technology applicable to journal editing and publishing including PubMed Central schema, journal article tag suite schema, Digital Object Identifier, CrossMark, ORCID, datadici, QR code, and App
• International standard of journal editing and publishing including International Committee of Medical Journal Editors’ Recommendations
• Reference styles including Vancouver (NLM) style, APA style, IEEE style, and ACS style
• Digital publishing in the web and App
• Education and training of editors, reviewers, and authors
• Manuscript editing
• Journal evaluation
• Bibliometrics and scientometrics
• Finance of journal publishing
• History of scholarly journal
• Copyright and Creative Commons License
• Open access and public access approaches

Its publication type includes original articles, reviews, case studies, essays, editorials, meeting reports, book reviews, announcement, correspondence, and video clips. Other types are also negotiable with the editorial board. All unsolicited articles are subject to peer review. Commissioned articles are reviewed by the Editorial Board.

About the journal

It launched in February 20, 2014 with volume 1 and number 1. It is to be published biannually. Supplement issues may be published. Circulation number of print copies is 500 per issue. Full text is freely available from: https://www.escienceediting.org or http://e-se.org. It is the member journal of Council of Science Editors, the Association of Learned and Professional Society Publishers, and European Association of Science Editors. There is no page charge or article processing charge of author side. This journal had been supported by the Korean Federation of Science and Technology Societies, the Government of the Republic of Korea (2013-2014). This journal was supported by the National Research Foundation of Korea Grant funded by the Korean Government (MOE).

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Presidential address: How to cope with the present environment of scholarly journal publishing

Sun Huh
Department of Parasitology and Institute of Medical Education, College of Medicine, Hallym University, Chuncheon, Korea

It is an honor for me to have the opportunity to serve as the 4th President of the Korean Council of Science Editors (KCSE) from January 2020 to January 2023. The KCSE, which was launched in 2011, is a unique organization, the membership of which includes representatives of scholarly journals in all scientific areas and journal publishing companies in Korea.

Organizations of Science Editors throughout the World

Worldwide, some organizations of science editors are organized at the country level, with examples including organizations in Vietnam (Vietnamese Council of Science Editors), Indonesia (Indonesian Association of Scientific Journal Editors) [1], and Brazil (Associação Brasileira de Editores Científicos). Additionally, Bulgaria, Croatia, Italy, Mexico, Peru, Russia, Turkey, and Vietnam have regional chapters of the European Association of Science Editors. Other regional organizations of science editors include the Council of Science Editors (CSE) in North America; the Council of Asian Science Editors (CASE) in East, Southeast, and South Asia; and the Asian Council of Science Editors in the Middle East and South Asia. Some other country-level organizations are limited to the medical field, such as the Korean Association of Medical Journal Editors.

Tasks of the KCSE

In contrast to other country-level organizations of science editors, the KCSE plays two unique roles: first, publishing a scholarly journal entitled Science Editing, and second, managing the Korea Manuscript Editors Certification. Science Editing, which was launched in 2014, is the official journal of the KCSE and CASE. It has been indexed in the Web of Science Core Collection as part of the Emerging Sources Citation Index since 2017 [2] and in Scopus since 2018 [3]. There are only a few international journals specifically for science editors: Science Editing; European Science Editing, which has been published since 1975 by the European Association of Science Editors; and Science Editor, which has been published since 1978 by the CSE. Science
Editing publishes articles on practical aspects of journal publishing and editing, aiming to help editors and publishers work more efficiently with up-to-date knowledge and skills. The Korea Manuscript Editors Certification was introduced in 2017 [4]. It has benchmarked the training and certificate systems for manuscript editors of the Board of Editors in the Life Sciences (BELS), American Medical Writers Association, and CSE. Although it is still in its roll-out stage, this certification system will bolster the professional competency of manuscript editors in Korea.

Beyond these two unique services, the main job of KCSE is to provide training for editors, manuscript editors, and staff of publishing companies on editing, manuscript editing, and research and publication ethics. Another exciting domain of the KCSE’s activities is its contributions to the CASE, which provides assistance to editors from various Asian countries by holding annual or biannual conferences and workshops [5]. The KCSE took on another new responsibility in September 2019, when it became responsible for maintaining the Scopus Expert Content Selection & Advisory Committee-Korea under an agreement with Elsevier; the role of this committee is to recommend journals in Korea to the Scopus Content Selection and Advisory Board [6].

The Recent Shifts Surrounding Scientific Journal Publishing in Korea

In Korea, the Korean Federation of Science and Technology Societies supports scientific journal publishing with a budget of about 4 million dollars per year, which is distributed according to the results of journal evaluations. As only 70% of journals that apply receive these funds, additional efforts must be made to increase the budget for supporting scientific journals. In order to increase the budget, it is necessary to persuade government officials and legislators with evidence of positive effects on the promotion of journals.

In recent years, the number of articles in Science Citation Index Expanded (SCIE) journals by Korean authors has steadily increased, while the number of scientific articles in the Korea Citation Index (KCI), which is the abstract database of Korean scholarly journals, showed a year-by-year decrease (Fig. 1). A comparison among fields is presented in Fig. 2; a decrease in the number of articles was found in the medicine, natural sciences, and agriculture. These findings indicate that Korean scientists already publish a higher number of articles in SCIE journals than in KCI journals. Because about 120 KCI journals are indexed in SCIE in January 2020, the number of articles in non-SCIE KCI journals may be much lower.

Furthermore, the number of KCI-indexed scientific journals has increased from year to year. Thus, it has become more difficult for scientific journal editors in Korea to attract manuscripts, even from Korean authors. The research competence and writing ability of Korean scientists have steadily increased, in correspondence with the increase of Korea’s research and development (R&D) budget, which is ranked 5th in the world [7]. The R&D budget of Korea was 676 billion US dollars in 2018, and the ratio of the R&D budget to national gross domestic product (4.55%) was the highest in the world [8]. If scientific journals from Korea are not indexed in international databases, this trend will inevitably continue. Editors and publishers should do their best to survive in the journal market.

Another international issue may also affect local journals. In Korea, most journals are published by academic societies or non-profit institutes; therefore, journals are generally open access, with no article processing charge or a minimum charge, and they own the copyright of articles. Plan S, which mandates all scholarly publications from research funded by Plan S funders to be published in open access journals or platforms will start in 2021. Since most scholarly journals pub-

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**Fig. 1.** Change in the number of scientific articles by Korean authors in Science Citation Index Expanded (SCIE) and Korea Citation Index (KCI) journals from 2016 to 2019 [cited 2020 Jan 21].

**Fig. 2.** Change in the number of articles in the Korea Citation Index database according to research field from 2016 to 2019 [cited 2020 Jan 21].
lished in Korea is open access without an embargo or deposited in the public repositories, it will be possible to recruit manuscripts supported by Plan S funders including the European Research Council and UK Research and Innovation [9].

Tasks for Editors to Promote Their Journals to International Standards

In accordance with these changes in the domestic and global environment of journal publishing, the members of the KCSE who are journal editors should prepare to recruit numerous higher-quality manuscripts from Korea or other countries. They should provide more reliable and better services to authors, reviewers, and readers by following the best practices of international-level journals. I suggest the following three tasks as initial steps that editors can take to promote their journals to the top tier. First, they should provide precise and detailed information on the journal’s adherence to the Principles of transparency and best practice in scholarly publishing, 3rd version (https://doaj.org/bestpractice). Second, if the journal has an open access policy, it should be registered with the Directory of Open Access Journals (https://doaj.org). Finally, the journal’s full-text files should be deposited in the National Library of Korea for digital archiving, which guarantees continuous access to journal content, even if the journal is discontinued at any time.

To help our members who are journal editors carry out these tasks with the best of their, the KCSE’s current activities, which already provide a solid foundation for excellence, will continue during my 3-year term. I hope that the work of the KCSE will be helpful for journal editors who devote themselves to editing on a voluntary basis.

Conflict of Interest

Sun Huh is the President of the Korean Council of Science Editors from January 2020 to January 2023.

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Plans towards open access

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During the past year, Plan S, a bold open access initiative that has been pursued by a coalition of mainly European research funding agencies, has been a major headline of the news on scholarly journal publishing [1]. Despite the opposition from many publishers and scholarly societies that publish journals, Plan S is expected to go into effect next January. The main goal of Plan S is to ensure that all researchers funded by participating agencies publish their findings in open access journals or platforms without an embargo period. Once it is implemented, it is expected to affect many journals in the whole world as well as those published in Europe. The participation of agencies in other countries that have expressed support for Plan S, especially those in China, will have a huge impact. Recently, it has been widely reported that the US administration may soon declare an executive order that has a similar content to Plan S. Although it is unclear if such an order will actually be announced because of the strong opposition from many scholarly societies in the United States, it is highly likely that the US administration will strengthen its open access policy in the long run. In Korea, I am aware that the National Research Foundation of Korea, the largest research funding agency, is conducting ongoing research to introduce a policy similar to Plan S. If these policies are actually implemented, the majority of journals around the world will eventually be forced to switch to full open access publishing.

One of the impetus for the open access movement is that the nature of modern academic research has changed significantly from the past. In the past, research was conducted mainly by a small and somewhat exclusive group of scholars in developed countries financed by relatively small research grants and the results were usually published in print journals run by scholarly societies. Nowadays, in many countries, research and development expenditure takes a significant portion of the national budget and more researchers publish many more papers than before mostly in online journals. In addition, collaborative research among scholars in other regions or countries is being carried out on a much larger scale than before. In the case of Korea, the amount of research funding from the national budget is about two billion dollars annually and is well over 4% of its gross domestic product. Researchers carry out their research with this funding and also get various benefits from it. Therefore, it is natural for taxpayers or the public to have some rights in the results obtained through these studies. Well-known reasoning for the open access movement is that taxpayers should not pay again to read papers which are the results of studies funded by them. Recent surges in journal subscription fees are creating disputes between libraries and publishers around the world. There has also been a growing antipathy that some publishers are making too much profit from the publication of
journals. Of course, journal publishers can make a large profit from open access publishing, too. The planners of Plan S seem to have devised various ways to prevent this.

Most journals are published online through the Internet these days, and the concept of open access is also limited to online publishing. The Internet is a space where a huge amount of information is provided and shared by lots of people and, by its very nature, makes it difficult to limit access of information. In recent years, open access repositories of preprints, which are pre-published papers with no peer review, are expanding rapidly in a number of academic disciplines. While there exists a strong opposition to this in the medical field because of the risk of inaccurate results being reported, the spread to other disciplines is accelerating. Plan S also allows authors to meet its requirements by posting final published versions of papers to these open access repositories. In the field of physics, a representative preprint archive named arXiv has existed for almost 30 years and been extensively used by physicists. Currently, preprints of about one-third of all Web of Science papers in physics are posted here. The spread of preprint archives implies that open access content will increase greatly, which can affect the open access movement substantially. It may also play an important role in changing the journal publishing environment in the future drastically.

Opponents of open access often point to the harmful effect of some open access journals, which publish a large number of low-quality papers for a purely commercial purpose. Gold open access journals can make more money by publishing more papers, so there is always a risk of moral hazard. The planners of Plan S are aware of this problem and offer some solutions. In order to publish high-quality papers that report accurate research results, journals should adopt a peer review system that is fair and efficient. However, with the recent rapid increase in the number of journals and papers, peer review is becoming an increasingly difficult task, regardless of whether the journal is open access or not. Researchers who perform peer review often feel that they do not get any reward for their efforts and are reluctant to accept an invitation to review a paper. On the other hand, many authors do not feel that their papers are reviewed fairly. According to some studies, less than 20% of all researchers participate in peer review [2]. There are also journals with very high desk rejection rates, which can be a source of strong dissatisfaction for authors. Some new ideas trying to encourage more researchers to participate in peer review and to make it more transparent, fair and efficient have been proposed, but it appears that there are no groundbreaking solutions that can significantly improve the current peer review system.

Naturally, researchers try to publish their best results in the most reputable journals. Since many of these journals are not open access, Plan S advocates the principle that only the intrinsic merit of the work, not the reputation or impact factor of the journal, will be considered when assessing research outputs during funding decisions. Of course, many people doubt that this principle will work. Nowadays, the evaluation of journals depends largely on quantitative indicators represented by the impact factor. These indicators are all based on the number of citations received by published papers. However, there have been many opinions that the number of citations shows only an approximate trend in the quality of journals and papers in a statistical sense and that the absolute numbers should not be given too much meaning. The development of new indicators or methods to assess the quality of journals and papers more accurately, perhaps with the help of advanced artificial intelligence techniques, is considered necessary.

So far, I have discussed some open access initiatives and closely related issues, such as public research funding, journal business model, preprint archive, peer review, and journal evaluation. Open access publishing is expected to expand greatly in the near future and many changes in various journal publishing environments will occur. If Plan S or a similar plan is implemented, it will affect journals in many countries. Since different countries have different laws and customs, there can be issues about how to deal with these differences. For example, in most open access journals published in Korea, the copyrights are owned by publishers, while Plan S specifies explicitly that the author should hold copyright. In my opinion, an important guideline to the issues related to journal publishing is that journals exist for the advancement of scholarship, and not the other way around. We need to endeavor to develop an efficient journal publishing system that serves best for the advancement of scholarship.

Conflict of Interest

Kihong Kim has been the editor of Science Editing since 2014.

References

History of the Scopus Expert Content Selection and Advisory Committee of Korea

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Abstract
With the objective of improving the quality of Korean journals and elevating them to international standards, the National Research Foundation of Korea, in consultation with Elsevier, formed the Scopus Expert Content Selection and Advisory Committee-Korea (ECSAC-Korea) as a local selection committee in August 2012. The committee reviews Korean journals for Scopus indexing and recommends them to the Scopus Content Selection and Advisory Board. In September 2019, ECSAC-Korea became part of the Korean Council of Science Editors (KCSE). This article describes the current status of Scopus indexing in Korea and the history, organizational structure, and role of ECSAC-Korea as part of the KCSE. The article also introduces the members of ECSAC-Korea and the KCSE steering committee for Scopus ECSAC-Korea, who have been active since September 2019.

Keywords
Scopus; History; Expert Content Selection and Advisory Committee-Korea; Korean journals; Korean Council of Science Editors

Introduction
The Scopus Expert Content Selection and Advisory Committee-Korea (ECSAC-Korea) became part of the Korean Council of Science Editors (KCSE) in September 2019. To formalize this partnership, the KCSE and Elsevier signed a memorandum of understanding (MoU) at the Korea Science and Technology Center on September 6, 2019. In accordance with this MoU, ECSAC-Korea’s Scopus content selection management project, which had been managed by the Korea National Research Foundation (KNRF) since 2011, is now managed by the KCSE as of September 2019 [1,2].

The KCSE manages the ECSAC-Korea, which in turn works with the Scopus Content Selection and Advisory Board (CSAB) and is responsible for providing advice on the evaluation and selection of Korean journals for indexing in Scopus. This new arrangement is expected to improve the quality of Korean journals, to provide high-quality related information, and to contribute to academic development in Korea. As of April 2019, 24,250 journals were registered in...
Scopus, of which 286 were Korean journals.
To celebrate and promote academic development in Korea, on October 2, 2019 in the International Conference Room of the National Library of Korea in Seoul, the KCSE conducted a commemorative symposium on the theme “How to help scholarly journal editors who want their journals to be listed in Scopus.” In this paper, I would like to describe the history of Scopus ECSAC-Korea and the progress of KCSE operations, as presented at the symposium. More specifically, this paper is divided into the following four sections: the Scopus selection process in Korea; the history of Scopus ECSAC-Korea; the progress of KCSE’s Scopus Evaluation and Management Agency; and the organization of the administration of ECSAC-Korea by the KCSE.

**The Scopus Selection Process in Korea**

In general, the evaluation process of journals, proceedings, and books for Scopus indexing is conducted by the Scopus team in the first stage (preliminary review) and by the CSAB in the second stage. However, four countries—Korea, Thailand, Russia, and China—have formed local expert content selection and advisory committees (respectively ECSAC-Korea, ECSAC-Thailand, ECSAC-Russia, and ECSAC-China) to manage the first and second stages of the evaluation process. The final decision on indexing is made by the CSAB.

The KNRF first recognized Scopus, which is operated by Elsevier and was created in 2004, as an international database in 2010. To elevate the quality of Korean journals to international standards, the KNRF agreed to manage ECSAC-Korea in November 2011 with Elsevier. The KNRF and Elsevier signed an MoU on November 24, 2011 (Fig. 1).

**History of Scopus ECSAC-Korea**

After signing an MoU with Elsevier on November 24, 2011, the KNRF formed Scopus ECSAC-Korea. The committee members were selected based on subject disciplines, taking into consideration the number of the journals listed in the Korean Citation Index and the proportion of subjects’ representation in Scopus. ECSAC-Korea includes one chair and 15 advisory members accountable for 30 main subject disciplines.

Scopus ECSAC-Korea, which was established on August 28, 2012, consisted of 16 prominent scholars from Korea, who served terms of 3 years. The chair was Professor Zheong Gou Kim of the Seoul National University (physics) and the members included Duk-Gyoo Kim, Kyungpook National University (electric engineering); Han Goo Lee, Sungkyunkwan University (History, philosophy); Young-Ok Lee, Sungkyunkwan University (English literature); Hyun Ku Kim, Sungkyunkwan University (public administration); Sang-In Jun, Seoul National University (sociology); Dong-Youp Suh, Korean Institute of Science (mathematics); Chul Koo Kim, Yonsei University (physics); Yeong Kug Lee, Sogang University (microbiology); Kwang Bo Shim, Hanyang University (ceramics); Dong Pyo Hong, Jeonbuk National University (dynamics and control); Ickho Song, Korea Institute of Science and Technology (mobile communication); Yong-Sung Juhn, Seoul National University (medicine); Young-Joon Surh, Seoul National University (pharmacology); Myung-Sook Choi, Kyungpook National University (food and nutrition); and Kyung Ja Oh, Yonsei University (psychology) [1].

In its second term (2015–2017), the committee of 15 reviewers was chaired by Professor Duk-Gyoo Kim, Kyungpook National University (electric engineering), whereas in its third term (2018–2020) the committee was chaired by Professor Hyungsun Kim, Inha University (materials engineering). The term of the office for reviewers is 3 years, but they can be re-appointed. The volunteer work of several members of Scopus ECSAC-Korea has contributed greatly to the internationalization of Korean journals. Through the numerous workshops held by the KNRF, the committee has helped domestic editors to elevate the quality of Korean journals to international standards.

Recently, the KNRF decided that ECSAC-Korea’s Scopus content evaluation management project should be carried out in the private sector. As a result, on November 2018, it was decided to transfer the project to another organization when the MoU expired. On September 1, 2019, Elsevier selected the KCSE as the most suitable institution for managing this proj-
ect and formed Scopus ECSAC-Korea [2]. Founded in 2011, the KCSE is an organization of science journal editors of Korea that aims to raise the quality of science journals published in Korea through information exchange and discussions on editing [3]. ECSAC-Korea, which was managed by the KNRF from 2011 to 2018, has been managed by the KCSE since September 2019.

**Progress of KCSE's Scopus Evaluation and Management Agency**

After the expiration of the MoU between the KNRF and Elsevier on November 20, 2018, the Korean branch of Elsevier recommended that the KCSE serve as the operator of ECSAC-Korea at the first working group meeting. After the second working group meeting of the KCSE with Elsevier Korea on February 22, 2019, the Scopus team (W. Meester and T. Chen) from Elsevier visited the KCSE on April 11, 2019 and discussed many issues, including the Korean agency's operational capacity, financial situation, and management policies related to humanities and social science journals. On May 23, the Scopus CSAB Chair Meeting (held in Berlin) approved the KCSE as the Scopus evaluation agency in Korea. On July 2, T. Chen, the Scopus manager, visited the KCSE to finalize various operational regulations and the content of the MoU. Finally, the MoU was signed with Hyungsun Kim, president of the KCSE and Yongsoo Jeun, regional director of Korea and Taiwan, Elsevier BV, on behalf of the vice-president of Scopus, at the KCSE in Seoul on September 6, 2019. The MoU re-

Table 1. Scopus ECSAC-Korea members

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<tr>
<td>Professor, Hyungsun Kim, Inha University, Chair of ECSAC-Korea</td>
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<td>Professor, Leighanne Kimberly Yuh, Korea University, Subject Chair—Humanities</td>
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<td>Professor, Ailee Cho, KAIST, Subject Chair—Language, Linguistics, Communication and Media</td>
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<tr>
<td>Professor, Young-seok Kim, Myungji University, Subject Chair—Library and Information Sciences Multidisciplinary</td>
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<tr>
<td>Professor, Youngsun Kwon, KAIST, Subject Chair—Business, Management &amp; Accounting, Decision Sciences, Economics, Econometrics &amp; Finance</td>
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<tr>
<td>Professor, Sung-Jun Myung, Gyeongsang National University, Subject Chair—Social Sciences (Public Administration), Law, Crime, Criminology and Criminal Justice</td>
</tr>
<tr>
<td>Professor, Innwoo Park, Korea University, Subject Chair—Education</td>
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<tr>
<td>Professor, Chul-Kyoo Kim, Korea University, Subject Chair—Social Sciences (Sociology), Psychology (Psychological Science)</td>
</tr>
<tr>
<td>Professor, Bae Ho Park, Konkuk University, Subject Chair—Chemical Engineering, Chemistry, Earth &amp; Planetary Science, Energy, Environmental Science, Materials Science, Mathematics, Physics &amp; Astronomy</td>
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<td>Professor, Wonhee Jang, Dongguk University, Subject Chair—Agricultural &amp; Biological Sciences, Biochemistry, Genetics &amp; Molecular Biology, Neuroscience, Veterinary</td>
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<td>Professor, Hyun Wook Park, KAIST, Subject Chair—Computer Science, Engineering (Electrical/Electronics)</td>
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<td>Professor, Sang Woo Joo, Yeungnam University, Subject Chair—Engineering (Mechanical)</td>
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<tr>
<td>Professor, Chadon Lee, Chungang University, Subject Chair—Engineering (Architectural/Civil)</td>
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<td>Professor, Dong Soo Han, Hanyang University, Subject Chair—Medicine</td>
</tr>
<tr>
<td>Professor, Sun Huh, Hallym University, Subject Chair—Health Professions, Dentistry, Immunology &amp; Microbiology, Pharmacology, Toxicology &amp; Pharmaceutics, Psychology (Psychiatry)</td>
</tr>
<tr>
<td>Professor, Eun-Hyun Lee, Ajou University, Subject Chair—Nursing</td>
</tr>
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</table>

Members list from ECSAC-Korea. Local Board for Korea [Internet]. Seoul: ECSAC-Korea; 2019 [4]. ECSAC-Korea, Expert Content Selection and Advisory Committee-Korea.

*Term of office: March 27, 2018 to December 31, 2020.*
main effective for 3 years (Fig. 2) [2].

Organization of the administration of ECSAC-Korea by the KCSE

KCSE formed Scopus ECSAC-Korea in consultation with the Elsevier Scopus team and established the Scopus Steering Committee as a special committee under its authority.

Scopus ECSAC-Korea

On September 1, 2019, the KCSE and Elsevier formed Scopus ECSAC-Korea and launched its operations. This committee evaluates domestic journals that apply to be listed in Scopus and provides evaluation information to the Scopus CSAB (Table 1) [4]. The KCSE plans to organize at least two seminars annually for journal editors to educate them and share information with them about the Scopus content selection process and activities to help achieve overall improvements in journal quality in Korea. The advantage of engaging this committee to review Korean journals is that by referring to the Korean Citation Index, the value of Korean journals with articles in the Korean language can also be appreciated.

Steering Committee of Scopus ECSAC-Korea

The steering committee of Scopus ECSAC-Korea is a special committee of the KCSE. The objective of this committee is to support the financial and training processes necessary for Scopus ECSAC-Korea to operate smoothly as it seeks to raise the quality of Korean journals. The main tasks of the committee are to support the operations of Scopus ECSAC-Korea through budgeting, training, and managing reports. It does not deal with the journal review process directly. The operation of this committee is subject to the bylaws of the steering committee of Scopus ECSAC-Korea, as part of the KCSE. The committee is composed of one chair, one vice-chair, and three to five members (Table 2) [5].

The committee receives an annual report from Scopus ECSAC-Korea, which includes (1) a list of ECSAC-Korea members; (2) minutes of the ECSAC-Korea committee; (3) budget implementation documents; (4) contents of the training process; (5) journal review, which includes the number of reviewed journals, the journals’ names, the results of review (pass or fail), the final CSAB review results, and the time taken by the journal; and (6) the Chair’s CSAB-chair meeting attendance report and other issues.

Conclusion

Starting in 2011, ECSAC-Korea under the KNRF helped Korean editors to become proficient with international standards of editing and publishing through various workshops. ECSAC-Korea has made major contributions to the internationalization of Korean journals through the volunteer work of chairs and subject advisory members. Since September 2019, the KCSE has undertaken the role of managing Scopus ECSAC-Korea. The agreement between Elsevier and the KCSE will enable ECSAC-Korea to engage in the active development of world-class Korean journals by delivering and sharing the relevant know-how and by holding educational programs for editors and publishers in various academic fields.

Conflict of Interest

Hyungsun Kim has been a Chair of the Scopus Expert Content Selection and Advisory Committee-Korea since 2018; otherwise, no potential conflict of interest relevant to this article was reported.

References


Changes in bibliographic information associated with Korean scientific journals from 2011 to 2019

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Abstract

Purpose: This study aimed to examine how the bibliographic information of 558 journals that applied for the Korean Federation of Science and Technology Societies funding in 2011 changed from 2011 to 2019, with the goal of informing the development of Korean scientific journals.

Methods: Between May and October 2012, bibliographic information from 558 journals was obtained from PDF files for the print versions of one issue of 2011 and the journal homepages. In August 2019, the bibliographic information of the same journals was traced based only on the journal websites. We compared bibliographic information.

Results: Excluding 14 journals that were discontinued or integrated with other journals prior to the follow-up in 2019, 544 journals were compared. Over the 8-year period, 121 journals underwent title changes. The number of journals with eISSNs (electronic International Standard Serial Number) increased from 214 (39.3%) in 2011 to 488 (89.7%) in 2019. “Aims and scope” descriptions were found for 291 journals (53.5%) in 2011 and 482 (88.6%) in 2019. The number of English-only journals increased from 163 (30.0%) to 227 (41.7%), and the number of journals with an open access policy rose from 92 (16.9%) to 315 (57.9%). Journals with DOI (digital object identifier) prefixes increased from 256 (47.1%) to 536 (98.5%).

Conclusion: The increased frequency of the above bibliographic information is evidence of the globalization of local journals. However, even in 2019, some journals still lacked the necessary bibliographic information. For better dissemination and promotion of Korean scientific journals, editors and publishers should more critically consider the proper inclusion of information on journal websites.

Keywords
Access to information; Bibliography; Follow-up studies; Periodicals as topic; Republic of Korea
Introduction

**Background/rationale:** Most Korean scientific journals are published by academic societies or nonprofit organizations, including research institutes and public institutions. The Korean Federation of Science and Technology Societies (KOFST) has supported journals and academic conferences since 1971. As such, KOFST routinely receives financial support requests from publishers. The minimum criterion to apply for financial support is indexing in the National Research Foundation of Korea-maintained Korea Citation Index, a literature database in which scholarly journals are indexed after a strict selection process. To be selected for KOFST funding, journals are evaluated for their compliance with the international standards of scholarly journal publishing [1]. Therefore, journal editors must ensure that their journals fit the KOFST selection criteria, which include some required bibliographic information. To this end, it will be helpful to examine the effect of journal evaluations by KOFST in 2011 by tracing changes in bibliographic information over the following 8 years.

**Purpose:** We aimed to analyze changes that took place from 2011 to 2019 in the bibliographic information of 558 journals that applied for KOFST funding in 2011. Specifically, we first traced several pieces of bibliographic information in 2011 and 2019. Second, we performed a comparative analysis of the data from those years; and third, we conducted a comparative analysis by research field. The results should inform future strategies for the promotion of Korean academic journals with regard to bibliographic information.

**Methods**

**Ethics statement:** Because this was a literature-based study, neither institutional review board approval nor informed consent was required.

**Study design:** This study was a literature-based descriptive and comparative study of the bibliographic information associated with Korean journals over 8 years of follow-up.

**Data sources:** Scientific journals that applied for KOFST funding in 2011 were included and examined and were analyzed again in 2019. In 2011, the number of target journals was 558. However, 14 journals were discontinued or consolidated with other journals during the study period; therefore, the final number of journals analyzed was 544.

**Measurement:** Between May and October 2012, PDF files of one issues and journal homepages of 558 journals were examined with respect to certain bibliographic information. The publishers confirmed the results of this examination. Those 558 journals were traced in August 2019 regarding the presence of the same information. The following bibliographic information was gathered: 1) journal title, 2) publisher name, 3) print International Standard Serial Number (pISSN), 4) electronic International Standard Serial Number (eISSN), 5) digital object identifier (DOI) prefix, 6) journal homepage URL, 7) “aims and scope” description, 8) frequency, 9) language, 10) existence of an open access policy, 11) research field, 12) title change, and 13) indexing in the Science Citation Index Expanded (SCIE).

The language of the journal was determined to be English if the full texts of all articles were written in English. Otherwise, it was categorized as Korean or Korean/English. Even issues containing English full-text articles were counted as Korean/English as long as at least one article was written in Korean. The existence of an open access policy was determined by evaluating the presence of an open access statement, including Creative Commons license information, in the masthead or the article.

**Statistical methods:** The data were described without further statistical analysis, because this study was an analysis of all target journals that applied for financial support from KOFST.

**Results**

**Descriptive data:** Raw data are available in Dataset 1. Table 1 shows the status of 544 journals traced 8 years later, after excluding 14 journals that had been discontinued or consolidated. In total, 121 of the 544 journals (22.2%) underwent title changes during the study period. Coded data for comparison was in Dataset 2.

A total of 544 journals were compared, excluding 14 journal titles discontinued prior to 2019. The number of journals according to research field was as follows: agriculture and fisheries, 65; engineering, 195; medicine, 191; and natural science, 93. With regard to frequency, quarterly (235) and bimonthly (180) publication schedules were most common in 2011. This trend was the same in 2019 (quarterly, 230; bimonthly, 195) (Fig. 1). The number of journals with pISSNs decreased from 541 (99.4%) in 2011 to 488 (89.7%) in 2019. In contrast, the number of journals with eISSNs increased from 214 (39.3%) in 2011 to 488 (89.7%) in 2019 (Fig. 2). “Aims and scope” descriptions were found in 291 (53.5%) and 482 (88.6%) journals in 2011 and 2019, respectively. The number of English-only journals increased from 163 (30.0%) to 227 (41.7%) over the study period. In 2011, 92 journals (16.9%) had an open access policy, while this number was 315 (57.9%) in 2019 (Fig. 3). The number of SCIE journals was 87 (16.0%) in 2011 and 108 (19.9%) in 2019.

Between 2011 and 2019, the number of English-only journals changed from 15 to 23 in the field of agriculture and fisheries, from 43 to 50 in engineering, from 64 to 110 in medicine, and from 41 to 44 in natural sciences (Fig. 4). During that same period, the number of open access journals changed from 10 to 32 in agriculture and fisheries, from 29 to 79 in en-
Table 1. Bibliographic information of the 544 Korean scientific journals in 2011 and 2019

<table>
<thead>
<tr>
<th>Item</th>
<th>Classification</th>
<th>2011</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>Korean, Korean/English</td>
<td>381 (70.0)</td>
<td>317 (58.3)</td>
</tr>
<tr>
<td></td>
<td>English</td>
<td>163 (30.0)</td>
<td>227 (41.7)</td>
</tr>
<tr>
<td>pISSN</td>
<td>Yes</td>
<td>541 (99.4)</td>
<td>519 (95.4)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3 (0.6)</td>
<td>25 (4.6)</td>
</tr>
<tr>
<td>eISSN</td>
<td>Yes</td>
<td>214 (39.3)</td>
<td>488 (89.7)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>330 (60.7)</td>
<td>56 (10.3)</td>
</tr>
<tr>
<td>DOI</td>
<td>Yes</td>
<td>256 (47.1)</td>
<td>534 (98.2)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>288 (52.9)</td>
<td>10 (1.8)</td>
</tr>
<tr>
<td>Open access statement</td>
<td>Yes</td>
<td>92 (16.9)</td>
<td>315 (57.9)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>452 (83.1)</td>
<td>229 (42.1)</td>
</tr>
<tr>
<td>Aims and scope</td>
<td>Yes</td>
<td>291 (53.5)</td>
<td>482 (88.6)</td>
</tr>
<tr>
<td>description</td>
<td>No</td>
<td>253 (46.5)</td>
<td>62 (11.4)</td>
</tr>
<tr>
<td>Frequency</td>
<td>Monthly</td>
<td>58 (10.7)</td>
<td>67 (12.3)</td>
</tr>
<tr>
<td></td>
<td>Bimonthly</td>
<td>180 (33.1)</td>
<td>195 (35.8)</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
<td>235 (43.2)</td>
<td>230 (42.3)</td>
</tr>
<tr>
<td></td>
<td>Three times a year</td>
<td>27 (5.0)</td>
<td>12 (2.2)</td>
</tr>
<tr>
<td></td>
<td>Semiannually</td>
<td>25 (4.6)</td>
<td>15 (2.8)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>19 (3.5)</td>
<td>25 (4.6)</td>
</tr>
</tbody>
</table>

pISSN, print International Standard Serial Number; eISSN, electronic International Standard Serial Number; DOI, digital object identifier.

gineering, from 31 to 161 in medicine, and from 22 to 43 in natural science (Fig. 5). In 2011, there were three online-only journals with eISSNs, but without pISSNs: one in engineering and two in medicine. However, this number had increased to 24 by 2019 (agriculture and fisheries, 2; engineering, 4; medicine, 9; natural sciences, 9).

Discussion

Key results: At the time of the follow-up analysis, 14 journals of the 588 that were identified in 2011 had changed titles. Over the same 8 years, 121 journals had changed titles. The number of journals with eISSNs, “aims and scope” descriptions, English-only status, open access policies, and DOI prefixes increased over the 8 years. The number of SCIE journals increased from 87 (16.0%) in 2011 to 108 (19.9%) in 2019.

Interpretation: The changes detailed above indicate that the editors and publishers have made great efforts to promote Korean journals to the international level, which means the fulfillment of the essential bibliographic information. The proportion of journals with DOI prefixes in 2019 was remarkable, at 98.2%. DOIs were rapidly introduced to most journals after they became a prerequisite to financial support by KOFST [1]. Also constituting an increase, 89.7% of journals evaluated in 2019 had eISSNs, which is similarly a requirement for KOFST funding. Another noteworthy change was the title change of 121 journals, which is evidence of the effort to globalize these journals. In most cases, the word “Korean” was omitted from the journal titles. By eliminating local names from journal titles, editors show that they want to recruit manuscripts from all over the world. It is inevitable that some editors would desire to widen the scope of authors from which they recruit papers because the number of articles published in journals in Korea has decreased year over year [2]. According to the increased research and development budget in Korea, Korean scientists’ research and writing competence have increased while the pressure to publish in SCIE journals persists. It is thus typical for the editors of local journals not to receive the highest-quality manuscripts.

Regarding the increase in English-only journals, this trend was especially prevalent in the medical field, and the reason for it is the same as that behind the journal title changes. In 2019, in medicine, the number of English-only journals was 110, while that of Korean or Korean/English journals was 81. This tendency toward English-only publications is based on the eligibility for listing in PubMed Central (PMC), which is a Journal Article Tag Suite XML–based full-text literature database maintained by the United States National Library of Medicine. To be listed in PMC, a journal must have English-only full texts of its articles. Journals from Korea began to be listed in PMC in 2018. By January 2020, 120 PMC-listed journals were Korean. Because PMC journals are searchable in PubMed, PMC eligibility became a strong incentive for medical journal editors in Korea to change the journal language to English-only. Open access is also more common in the medical field (161 of 191 journals [84.3%]) than in other areas (less than 50% of journals). An open access declaration is similarly a prerequisite to PMC participation.

Although some journals in fields other than medicine lack explicit open access statements, they are usually available under free access. In this study, only journals with open access statements under the Creative Commons license were considered to be open access. However, 164 additional journals were freely accessible. Only 65 journals were closed-access or had no available homepage.

What is the main background of the above change in Korean scientific journals? The most critical incentive was the selection criteria by KOFST for journal support, where that bibliographic information was listed. Furthermore, there may be journal editors’ efforts to upgrade the journal.

Limitation: Data in 2011 were obtained from PDFs of the print versions and the online versions of the journals, while data...
obtained in 2019 came only from the journals' homepages. Therefore, we cannot rule out the possibility of incomplete information or error due to the careless maintenance of the online versions of journals by publishers. As for the 2019 data, only one author performed the search, and the publishers did not confirm the data or results. Unintentional errors, therefore, may have been present in the search for and recording of data in 2019. The target journals of this study were those that applied for KOFST funding in 2011; journals that did not apply were not included, nor were journals launched after 2011.
Generalizability: The results of this study are representative of the status of scientific journals in Korea, as the number of scientific journals in the Korea Citation Index was 769 in December 2019. Although some journals published by commercial publishing companies or universities and public institutions do not apply for KOFST funding, most society journals do so.

Conclusion: Current bibliographic information has evolved considerably, and the standards for scholarly journals have been well established for 8 years. However, some journals still do not issue DOIs, do not display eISSNs on their websites, and do not disclose detailed descriptions of necessary bibliographic information online. For example, some journals still do not explicitly describe their aims and scope on their homepage. The data mentioned above (“aims and scope” description, DOI, eISSN, etc.) should be clearly marked on the website as necessary bibliographic information associated with the journal. The quickest way to clarify the essential bibliographic information was to evaluate a journal’s compliance with the “Principles of transparency and best practice in scholarly publishing, 3rd version” [3]. All journals that apply for KOFST funding can attempt to follow these standards. In addition to the content of a journal, the appearance of the website should follow international standards.

Conflict of Interest

Sun Huh has been the President of the Korean Council of Science Editors since January 17, 2020. Hye-Min Cho serves as an editor of the Science Editing, but has no role in the decision to publish this article. Except for that, no potential conflict of interest relevant to this article was reported.

Acknowledgments

The work to obtain the bibliographic information of the journals from the last issue of 2011 was supported by the Korean Federation of Science and Technology Societies (2012), and the recipient of this financial support was Hye-Min Cho.

Data Availability

Dataset is available from the Harvard Dataverse at: https://doi.org/10.7910/DVN/DCAEC1.

Dataset 2. Coded data for comparison of the 544 journals’ bibliographic information between in 2011 and in 2019.

References

An analysis of data paper templates and guidelines: types of contextual information described by data journals

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Abstract
Purpose: Data papers are a promising genre of scholarly communication, in which research data are described, shared, and published. Rich documentation of data, including adequate contextual information, enhances the potential of data reuse. This study investigated the extent to which the components of data papers specified by journals represented the types of contextual information necessary for data reuse.
Methods: A content analysis of 15 data paper templates/guidelines from 24 data journals indexed by the Web of Science was performed. A coding scheme was developed based on previous studies, consisting of four categories: general data set properties, data production information, repository information, and reuse information.
Results: Only a few types of contextual information were commonly requested by the journals. Except data format information and file names, general data set properties were specified less often than other categories of contextual information. Researchers were frequently asked to provide data production information, such as information on the data collection, data producer, and related project. Repository information focused on data identifiers, while information about repository reputation and curation practices was rarely requested. Reuse information mostly involved advice on the reuse of data and terms of use.
Conclusion: These findings imply that data journals should provide a more standardized set of data paper components to inform reusers of relevant contextual information in a consistent manner. Information about repository reputation and curation could also be provided by data journals to complement the repository information provided by the authors of data papers and to help researchers evaluate the reusability of data.

Keywords
Data papers; Data journals; Data description; Data documentation; Contextual information
Introduction

Data sharing is an emerging scholarly communication practice that facilitates the progress of science by making data accessible, verifiable, and reproducible [1]. There are several ways of sharing data, including personally exchanging data sets, posting data on researchers’ or laboratories’ websites, and depositing data sets in repositories. A relatively novel means of releasing data sets is the publication of data papers, which describe how data were collected, processed, and verified, thereby improving data provenance [2]. Data papers are published by data journals, and the publication process is similar to that of conventional journals, in that data papers and data are both peer-reviewed, amended, and publicly accessible under unique identifiers [3]. Since data papers take the form of academic papers and can be cited by primary research articles, credit can be given to data creators [4].

Data papers contain facts about data instead of hypotheses and arguments resulting from an analysis of the data, as commonly presented in traditional research articles [5]. Their primary purpose is thus to explain data sets by providing “information on the what, where, why, how, and who of the data” [6]. The primary advantage of data papers is their rich documentation of data, which is essential for data reuse. A data paper is usually short and consists of an abstract, collection methods, and a description of the relevant data set(s) [7].

However, previous studies have identified a lack of shared templates/guidelines for data papers across data journals. Candela et al. identified 10 classes of data paper components recommended by data journals: availability, competing interests, coverage, format, license, microattribution, project, provenance, quality, and reuse. The authors noted that a unique identifier indicating data availability, such as a DOI or URI, was the only information provided by all the data journals they examined. Less than half of the data journals asked for information on coverage, license, microattribution, project, and reuse [8]. In addition, Chen explained that data paper templates/guidelines mostly focus on single data sets—that is, on the item level—and only a few provide collection-level descriptions of data, such as multiple data sets or databases. The author suggested that the granularity of research data that a data paper describes should be specified by data journals [9].

The lack of standardization and the problem of granularity in describing data have been discussed in other studies regarding data documentation and metadata [10-12]. Those studies also indicated that documenting an adequate amount of proper contextual information about data would increase the potential for data reuse. The underlying goal of publishing data papers likewise is to enable data reuse, and such papers are expected to address the challenges that elicit “data reuse failure” [13,14]. In this context, the present study examined the types of contextual information that data journals request to be described and determined how common or variable these types of information are across such journals.

This study aimed to identify the components of a data paper as defined by the templates/guidelines of 24 data journals indexed by Web of Science (WoS), with the document type restricted to data papers. The data paper components were mapped onto the types of contextual information suggested by previous studies [15,16]. Therefore, it may be possible to determine the extent to which data papers published in various journals cover the contextual information that researchers need for data reuse and to identify common and unique components across the data journals. The results would help researchers better understand areas for improvement in the guidance provided by data journals for documenting data and in the roles of data journals.

Methods

This study initially identified a broad set of data journals on the basis of 1) two studies [8,9] that conducted a content anal-
ysis of data paper templates and/or guidelines and 2) a list of data journals reported by Akers [17]. Candela et al. [8] analyzed 116 data journals from 15 publishers via web-based searches. Chen [9] created an initial list of 93 data journals on the basis of Akers’ list and searches on UlrichsWeb and selected 26 data journals from 16 publishers with appropriate consideration of disciplinary domains. Excluding duplicate journals from the two studies resulted in 106 data journals. As previous studies [8,9] suggested, the vast majority of the data journals were mixed journals (i.e., journals publishing any type of paper, including data papers), and pure data journals (i.e., journals publishing only data papers) accounted for only a small proportion.

This study utilized WoS as a tool for selecting the data journals for the analysis. Despite debates over the trustworthiness of journal impact factors generated by WoS, journals indexed by WoS usually maintain a good status because they need to meet the quality criteria set by the database. Of the 106 data journals, 79 were indexed by WoS. The search was restricted to the “data papers” document type in the advanced search function of the database, and 24 data journals were ultimately selected (Fig. 1) [8,9]. Eighteen of those 24 journals overlapped with those examined by either or both of the aforementioned studies (10 by Candela et al. [8], 1 by Chen [9], and 7 by both). The six other journals, namely, *BioInvasions Records, Data, Ecological Research, Journal of Hymenoptera Research, Frontiers in Marine Science, and Comparative Cytogenetics*, were also analyzed in this study.

Of the 24 data journals, seven were published by Springer Nature and six by Pensoft (Appendix 1). All the journals published by Pensoft used the same data paper guideline. Among the seven Springer Nature journals, five BioMed Central (BMC) journals shared a single data paper guideline. The remaining data journals provided their own data paper templates and/or guidelines. Therefore, this study collected 15 distinctive data paper templates and/or guidelines for the analysis.

To investigate the contextual information covered by the data papers, I used the types of contextual information suggested by Faniel et al. [15] and Chin and Lansing [16], who elaborated a range of data contexts reflecting the perspectives of data reusers. Chin and Lansing [16] originally proposed various attributes of scientific and social contexts that facilitated data sharing in biological science collaboratories. Four of these contextual attributes are particularly relevant to the scientific context, and therefore were employed for the analysis (Table 1) [8,9,15,16]. I then mapped the types of contextual information onto the data paper components identified by Candela et al. [8] and Chen [9]. This mapping enabled a preliminary assessment of the relationship between data paper components and contextual information and the develop-

| Table 1. Mapping between types of contextual information and data paper components |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| **Types of contextual information** | **Data paper components** |
|------------------------------------|------------------------------------|------------------------------------|
| Data production information | Data collection | Experimental properties | Quality, provenance | Collection |
| | Specimen and artifact | - | Coverage | Coverage |
| | Data producer | - | Microattribution | Description (file creators), author’s contribution |
| | Data analysis | Analysis and interpretation | - | - |
| | Missing data | - | - | - |
| | Research objectives | - | - | - |
| Repository information | Provenance | Data provenance | Availability | Identifier, relationship |
| | Repository reputation and history | - | - | - |
| | Curation and digitization | - | - | - |
| Data reuse information | Prior reuse | - | Reuse | - |
| | Advice on reuse | - | Reuse | - |
| | Terms of use | - | License, competing interests | Copyright, ethical approval, consent to publication, competing interests |
| | - | General data set properties | Format | Description (file format, version, creation date) |
| | - | - | Project | Funding statement |
Table 1 showed that not all the types of contextual information suggested by Faniel et al. [15] matched with the data paper components. Specifically, no data paper component identified by the previous studies corresponded to “data analysis,” “missing data,” “research objectives,” “repository reputation and history,” and “curation and digitization.” There was also an inconsistent definition of the term “provenance” between the studies. Candela et al. [8] defined this notion the “methodology leading to the production of the data set”, which is more similar to “data collection” than the definition by Faniel et al. as “sources of the material or traceability”.

“General data set properties,” suggested by Chin and Lansing [16], corresponded to a data paper component relating to the description of data formats, versions, and creation dates. Moreover, “project,” which was mentioned by Candela et al. [8], referring to information about the initiatives within which data are generated, was the only component that did not match any of the types of contextual information. “Funding statement,” which was identified by Chen [9], was also related to the “project” element. Being aware of information about a project and the funding sources that led to data creation would be useful when considering the possibility of data reuse. Thus, this study considered project information to be additional contextual information.

The coding scheme for analyzing the data paper components was largely based on the types of contextual information suggested by Faniel et al. [15]. In addition, the “general data set properties” component, which was noted by Chin and Lansing [16], was added to the coding scheme. The “project” component was included under the “data production information” category, which was proposed by Faniel et al. [15], since it was a contextual factor relevant to data creation.

**Results**

The types of contextual information examined in this study were categorized into four groups: general data set properties, data production information, repository information, and data reuse information. Concerning general data set properties, the study explored whether the 15 data paper templates and/or guidelines required the authors to describe the attributes listed in Table 2. Data creation dates, formats, and versions were mentioned by Chen [9], and the remaining properties were identified during the coding process.

Data file name/title was the only property requested by eight of the templates/guidelines (53.3%), and data format description was requested by seven templates (46.7%). The rest of the data set properties were required infrequently by the data journals, and descriptions of data creation dates and languages were rare. Data type was defined differently by the journals; for example, *Journal of Open Archaeology Data* (JOAD) distinguished among primary data, secondary data, processed data, interpretation of data, and final reports, whereas *Data in Brief* (DiB) classified data by type into tables, images, charts, graphs, and figures.

Data production information tended to be requested more frequently by the data journals than general data set properties (Table 3). All the templates and guidelines required information relating to data collection, mainly regarding data collection steps, sampling strategies, and quality control mechanisms. Descriptions of data producers were required by nine journals.

<table>
<thead>
<tr>
<th>General data set properties</th>
<th>J_BMC (^a)</th>
<th>SD</th>
<th>BMCGenet</th>
<th>J_Itensaat (^b)</th>
<th>ER</th>
<th>Ecol</th>
<th>GDJ</th>
<th>ESSD</th>
<th>DiB</th>
<th>FIMS</th>
<th>Data</th>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>


\(^a\)Five BMC data journals that used the same guideline were included: BMC Bioinformatics, BMC Genomics, BMC Medical Genomics, BMC Medical Informatics and Decision Making, and BMC Musculoskeletal Disorders.

\(^b\)Six data journals published by Pensoft that used the same guideline were included: Biodiversity Data Journal, Comparative Cytogenetics, Journal of Hymenoptera Research, Neobiota, Phytokeys, and Zookeys.
templates/guidelines, five of which specifically asked for information about the data creators (author list of data sets [GigaScience] or creators [Ijournals, Geoscience Data Journal, Data, JOAD]). The four remaining journals asked for a description of the authors’ contributions or information, which possibly corresponded to the role of data creator. The “project” component was mentioned by seven templates/guidelines, and only two of these required overall project descriptions (Ecology and Ijournals). The remaining five journals required information about funding.

Specimen and artifact information was requested by five templates/guidelines of biological science, geoscience, and archaeology journals, and researchers in these disciplines needed such information for data reuse [15]. Temporal, spatial, or taxonomic coverage (Ijournals, JOAD), sample availability or location (Earth System Science Data, DiB), and descriptions of organisms or tissues (GigaScience) were identified. Information about data analysis, missing data, and research objectives was also requested by four or five templates/guidelines. Data analysis information involved how data were processed, and missing data information dealt with data anomalies or noise. The research objectives were often expressed as motivations or rationales for collecting the data sets.

In terms of repository information, all but one journal

Table 3. Data production information identified in the data paper templates/guidelines

<table>
<thead>
<tr>
<th>Data production information</th>
<th>J_BMC 4</th>
<th>SD</th>
<th>BMC genet</th>
<th>J_Ijournals 4</th>
<th>ER</th>
<th>Ecol</th>
<th>GDJ</th>
<th>ESSD</th>
<th>DiB</th>
<th>FiMS</th>
<th>Data</th>
<th>GigaSci</th>
<th>BIR</th>
<th>LJRR</th>
<th>JOAD</th>
</tr>
</thead>
<tbody>
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<td>Data collection</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Specimens and artifacts</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Data producer</td>
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<tr>
<td>Missing data</td>
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</tr>
<tr>
<td>Research objectives</td>
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</tr>
</tbody>
</table>

SD, Scientific Data; BMC genet, BMC Genetics; ER, Ecological Research; Ecol, Ecology; GDJ, Geoscience Data Journal; ESSD, Earth System Science Data; DiB, Data in Brief; FiMS, Frontiers in Marine Science; GigaSci, GigaScience; BIR, BioInvasion Records; LJRR, International Journal of Robotics Research; JOAD, Journal of Open Archaeology Data.

4Five BMC data journals that used the same guideline were included: BMC Bioinformatics, BMC Genomics, BMC Medical Genomics, BMC Medical Informatics and Decision Making, and BMC Musculoskeletal Disorders; 6Six data journals published by Pensoft that used the same guideline were included: Biodiversity Data Journal, Comparative Cytogenetics, Journal of Hymenoptera Research, Neobiota, Phytokeys, and Zookeys.

Table 4. Repository information and data reuse information identified in the data paper templates/guidelines

<table>
<thead>
<tr>
<th>Types of contextual information</th>
<th>J_BMC 4</th>
<th>SD</th>
<th>BMC genet</th>
<th>J_Ijournals 4</th>
<th>ER</th>
<th>Ecol</th>
<th>GDJ</th>
<th>ESSD</th>
<th>DiB</th>
<th>FiMS</th>
<th>Data</th>
<th>GigaSci</th>
<th>BIR</th>
<th>LJRR</th>
<th>JOAD</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Provenance</td>
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</tr>
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<td>Advice on reuse</td>
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<tr>
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</tbody>
</table>

SD, Scientific Data; BMC genet, BMC Genetics; ER, Ecological Research; Ecol, Ecology; GDJ, Geoscience Data Journal; ESSD, Earth System Science Data; DiB, Data in Brief; FiMS, Frontiers in Marine Science; GigaSci, GigaScience; BIR, BioInvasion Records; LJRR, International Journal of Robotics Research; JOAD, Journal of Open Archaeology Data.

4Five BMC data journals that used the same guideline were included: BMC Bioinformatics, BMC Genomics, BMC Medical Genomics, BMC Medical Informatics and Decision Making, and BMC Musculoskeletal Disorders; 6Six data journals published by Pensoft that used the same guideline were included: Biodiversity Data Journal, Comparative Cytogenetics, Journal of Hymenoptera Research, Neobiota, Phytokeys, and Zookeys.
asked to describe the provenance of the data, indicating the identifier or location of data (Table 4). Data provenance also referred to the relationship of data with other materials, although only one journal (DiB) required a description of any research articles related to the data. None of the data journals asked for descriptions of the repository reputation and history. Regarding curation and digitization, one journal (Ecology) required information on archival procedures, including a description of how the data were archived for long-term storage and access.

Data reuse information, mostly concerning advice on reuse and terms of use, was requested (Table 4). In regard to advice on reuse, the authors were required to describe the potential reuse and value of their data for reuse. Data journals required authors to describe the terms of use, primarily relating to competing interests, but several other aspects existed, including ethical approval and consent for participation, consent for publication, license, copyright, and accessibility requirements.

**Discussion**

The findings revealed common and unique types of contextual information that the data journals requested authors to describe. The most common form of contextual information documented by the journals was data collection methods, followed by data provenance (repository locations and/or data identifiers). More than or almost half of the templates/guidelines identified data file names/titles and data formats as general data set properties, data production information (including data producer and project), and reuse information (including advice on reuse and terms of use). The results are mostly consistent with those of previous studies [8,9]. Yet, Candela et al. [8] mentioned that descriptions of reuse information are often neglected by data journals, but most of the data journals examined in this study addressed the potential reuse of data. In terms of data provenance (indicating the relationship of data to other objects), only one journal (DiB) in this study required information on this relationship, although Chen [9] identified more instances of this information being required.

The types of contextual information that the data journals never or rarely requested included repository information (repository reputation and history, and curation and digitization) and data set properties (data creation dates and languages). In particular, Faniel et al. [15] stated that repository reputation and history are less easily documented since they are more social and relative than other types of context. Two of the data journals examined in this study (Scientific Data and Earth System Science Data) provided criteria for recommending data repositories, namely, data access conditions and long-term availability [18,19]. The provision of such repository information by data journals would help reusers understand the trustworthiness of the repositories where certain data are deposited. While data creation dates will help reusers develop sampling frames and identify changes in data creation contexts [20], only one journal asked for this information.

Data production information regarding data analysis, missing data, and research objectives was not specified by the studies of Candela et al. [8] and Chen [9] (Table 1). However, four or five of the templates/guidelines asked for a description of such information. Furthermore, data journals infrequently requested information on data version, file size, and prior reuse, which three of the templates/guidelines mentioned.

Overall, only a small amount of contextual information was commonly requested by the data journals. They tended to focus more on data production information (data collection, data producer, and project) and reuse information (potential reuse and terms of use) than general data set properties or repository information. With the exception of file names and data formats, descriptions of data set properties were generally lacking. Repository information mostly involved unique identifiers of data, but information about repositories’ reputation or their curation practices could be provided by data journals to help readers of data papers assess the reusability of data.

In conclusion, the present study examined types of contextual information that data journals asked authors to describe and determined the extent of variation in this information across certain data journals. The primary motivation of publishing data papers is to make data reusable and reproducible, and data papers should provide extensive data documentation that reflects sufficient contextual information. This study suggests that data journals should provide a more standardized set of data paper components to inform reusers of the various types of context in a consistent manner. Furthermore, data journals should not only require data availability information, but also provide details about the quality of data repositories that would complement the repository information described by data paper authors.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

**References**

2. Pasquetto IV, Randles BM, Borgman CL. On the reuse of
17. Akers K. A growing list of data journals [Internet]. [place unknown]: Data@MLibrary; 2014 [cited 2020 Jan 20]. Available from: https://mlibrarydata.wordpress.com/2014/05/09/data-journals/
### Appendix 1. Twenty-four data journals selected for the analysis

<table>
<thead>
<tr>
<th>Publisher</th>
<th>Data journal (full name)</th>
<th>Subject area</th>
<th>Publishing model</th>
<th>Pure vs. mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Springer Nature</td>
<td><em>BMC Bioinformatics</em>(^{a})</td>
<td>Biochemical research methods</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>BMC Genetics</em></td>
<td>Genetics, heredity</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>BMC Genomics</em>(^{a})</td>
<td>Biotechnology, applied microbiology</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>BMC Medical Genomics</em>(^{a})</td>
<td>Genetics, heredity</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>BMC Medical Informatics and Decision Making</em>(^{a})</td>
<td>Medical informatics</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>BMC Musculoskeletal Disorders</em>(^{a})</td>
<td>Orthopedics</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Scientific Data</em></td>
<td>Multidisciplinary sciences</td>
<td>OA</td>
<td>Pure</td>
</tr>
<tr>
<td>Pensoft(^{b})</td>
<td><em>Biodiversity Data Journal</em></td>
<td>Biodiversity conservation</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Comparative Cytogenetics</em></td>
<td>Genetics, heredity</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Journal of Hymenoptera Research</em></td>
<td>Entomology</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Neobiota</em></td>
<td>Biodiversity conservation</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Phytokeys</em></td>
<td>Plant sciences</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td></td>
<td><em>Zookeys</em></td>
<td>Zoology</td>
<td>OA</td>
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<tr>
<td>Wiley</td>
<td><em>Ecological Research</em></td>
<td>Ecology</td>
<td>Hybrid</td>
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<td>Hybrid</td>
<td>Mixed</td>
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<tr>
<td></td>
<td><em>Geoscience Data Journal</em></td>
<td>Geosciences, multidisciplinary</td>
<td>OA</td>
<td>Pure</td>
</tr>
<tr>
<td>Copernicus Publications</td>
<td><em>Earth System Science Data</em></td>
<td>Geosciences, multidisciplinary</td>
<td>OA</td>
<td>Pure</td>
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<td>Elsevier</td>
<td><em>Data in Brief</em></td>
<td>Multidisciplinary sciences</td>
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<td>Environmental sciences</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td>MDPI</td>
<td><em>Data</em></td>
<td>Computer science information systems</td>
<td>OA</td>
<td>Mixed</td>
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<tr>
<td>Oxford University Press</td>
<td><em>GigaScience</em></td>
<td>Multidisciplinary sciences</td>
<td>OA</td>
<td>Pure</td>
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<tr>
<td>REABIC Journals</td>
<td><em>Biodiversity Records</em></td>
<td>Biodiversity conservation</td>
<td>OA</td>
<td>Mixed</td>
</tr>
<tr>
<td>Ubiquity Press</td>
<td><em>Journal of Open Archaeology Data</em></td>
<td>Archaeology</td>
<td>OA</td>
<td>Pure</td>
</tr>
</tbody>
</table>

OA, open access.  
\(^{a}\)These journals share a single data paper guideline;  
\(^{b}\)The journals published by Pensoft use the same data paper guideline.
Compliance of “Principles of transparency and best practice in scholarly publishing” in Korean academic society-published journals listed in Journal Citation Reports

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¹Research Institute for Social Science, Ewha Womans University, Seoul, Korea; ²Computer Science Department, Drexel University, Philadelphia, PA, USA; ³Nature Research, Seoul, Korea

Abstract
Purpose: The “Principles of transparency and best practice in scholarly publishing” are of increasing importance in an open science environment as a way to increase the transparency and quality of academic society journals. However, little previous research has investigated the application of this new guideline in practice. The aim of this study was to investigate the degree to which this guideline is being applied by Korean academic society–published journals listed in Journal Citation Reports.

Methods: The researchers investigated the homepages of 59 Korean academic society–published journals to evaluate whether they had adopted the 33 items listed in the guideline. Based on the information available on the journals’ homepages, each item was classified as ‘yes’ or ‘no’ within the four categories of basic journal information, publication ethics, copyright and archiving information, and profit model.

Results: The basic journal information category was generally well-practiced, with the exceptions of the peer review process, readership, and author fees. The copyright and licensing information category was also well-practiced, with the exception of policies on posting accepted articles with third parties and archiving items. However, most items in the publication ethics category were not well practiced, with the exception of authorship and intellectual property. All items in the profit model category were infrequently implemented.

Conclusion: These findings serve as a good indicator for Korean journal editors of areas for improvement. It may be helpful to review journals’ publication policies and homepages to comply with international publishing standards.

Keywords
Best practice; Scholarly publishing; Academic society journals; Transparency; Publication ethics
Introduction

Many scientific communities, primarily in Europe and the United States, are attempting to facilitate cooperation and innovation by promoting open science, including requirements to digitize research findings supported by public funding and to disclose those findings to the scientific community, industry, and the general public. The open science movement involves both mandating that academic journals that publish scholarly articles follow the principles of open access, and requiring researchers to disclose their findings through multiple modalities, including audio or video recordings and raw data files. As the concept of open science is expanding from open access to open data, numerous publishers are establishing more open access journals, while supporting systematic open science initiatives, such as requiring that researchers make their raw data available [1].

However, despite the positive potential of open access policies, increasingly many predatory publishers abuse these policies. In light of these problems, academic publishers have announced various remedies, such as introducing stricter review standards when registering new journals in multiple databases. As a response to ensure transparency in academic publishing, four international organizations—the Open Access Scholarly Publishers Association, Directory of Open Access Journals, Committee on Publication Ethics, and World Association of Medical Editors—jointly “Principles of transparency and best practice in scholarly publishing.” These 16 principles include instructions on operating sustainable academic journals through ensuring compliance with publication ethics, proper archiving, and reasonable accessibility, as well as transparent disclosure of journal information, such as its ownership and management, editorial board, peer review, article processing charges, and other sources of revenue. The four international scholarly organizations have implemented these standards in the review process for any membership application as a way to screen fraudulent publishers, and require strict compliance with this code of conduct for existing members [2].

The International Association of Scientific, Technical, Medical Publishers (STM), an alliance of 120 major publishers that release more than 66% of scholarly journals worldwide, requires member publishers to comply with a code of conduct and principles of publication ethics. In August 2018, STM issued a statement addressing the increase in unethical and fraudulent scholarly journals [3].

Several indexing databases, such as Scopus and MEDLINE, will not consider a journal’s application to be listed beyond the initial review process unless the journal satisfies the 16 fundamental Principles of Transparency and Best Practice in Scholarly Publishing [4]. The journal review process for PubMed Central (PMC) recently implemented a stricter quality control process due to the emergence of commercial publishers that offer lower-quality open access journals. The following quality control criteria are reviewed during the application process. Since these five standards are already included in the “Principles of transparency and best practice in scholarly publishing,” it is imperative that journals meet and comply with these standards in order to be listed in MEDLINE and PMC [5].

1. Are the journal’s aims and scope clearly stated and adhered to? 2. Is the peer-review process explicit and sufficiently detailed? 3. Are the journal’s ethical policies clearly stated and adhered to? 4. Are commercial sponsorships clearly addressed (i.e., do not raise questions about the objectivity of published content)? 5. Do the authors consistently disclose financial conflicts of interest?

Even though the “Principles of transparency and best practice in scholarly publishing” were revised in January 2018, there has been little active research in Korea with the goal of ascertaining the degree to which Korean scholarly journals are complying with these principles. Therefore, it is necessary to evaluate Korean scholarly journals with respect to these principles and to identify directions for improvement [6].

No previous related research has been conducted on compliance with these principles, besides article on the ethics policy of Annals of Pediatric Endocrinology & Metabolism [7] and a study on 781 scholarly journals around the world [8], which were conducted by the authors of this article.

Therefore, in this study, we analyzed the extent to which Korean scholarly journals have responded to the “2018 Principles of transparency and best practice in scholarly publishing.”

Methods

We analyzed journals published by Korean academic societies to determine the extent to which they apply the “Principles of transparency and best practice in scholarly publishing,” a global standard that has been established by several authoritative entities in scholarly publishing. These principles have been revised twice since they were first adopted in December 2013. For the second edition, released in August 2015, revisions were made by Open Access Scholarly Publishers Association, and the current edition was published in January 2018. The academic journals analyzed in this study were retrieved from the website of Clarivate Analytics by accessing the 2019 version of the Journal Citation Reports and searching with the filter criterion of South Korea for country code, and additional information about the journals was obtained from the Science Citation Index Expanded. In total, 116 journals were identified, and we downloaded a list of these journals. It was found that...
Korean Journal of Horticultural Science & Technology and Horticulture, Environment and Biotechnology were the same journal; the former had changed its name to the latter, but both names remained registered in the list of journals. We chose to analyze only Horticulture, Environment and Biotechnology, yielding a list of 115 journals. For each of these 115 journals, we first accessed the journal website to identify the publisher. Since international commercial publishers are making reasonable efforts to be compliant with the given standards, we excluded journals that distributed print or online materials through a platform provided by a commercial publisher, even if they had an address corresponding to the respective academic society. Thus, we included 59 journals in the final analysis.

We concentrated on reviewing the author guidelines and publication ethics presented on the webpages of the 59 journals that we analyzed, in order to assess how the 16 principles stipulated by the “Principles of transparency and best practice in scholarly publishing” had been implemented to academic journals. The analysis was conducted from December 1, 2019, to December 31, 2019. We double-checked the items identified as “poor” during the preliminary analysis to verify whether journals were compliant with the corresponding criteria based on the information on their webpages.

Similarly to a previous article published by the same researchers [8], we classified the 16 principles into four subgroups: basic journal information, publication ethics information, copyright and archiving information, and profit model information. If compliance with a criterion was satisfactory, the item was marked as “yes”; otherwise, it was marked as “no.”

Results

Of these 115 journals, 59 were published by Korean publishing agencies: 20 through XMLink, 14 through Inforang, 12 through M2Community, and one through Kpubs. Twelve journals did not specify a publisher on the webpage, and were therefore indicated as having no information for this item. Fifty-six journals were published through international publishers: 32 through SpringerNature, 10 through TECHNO-PRESS, eight through Elsevier, two through Wiley, and one each through Taylor & Francis, OSA Publishing, and IEEE.

The distribution of the 115 journals' 2019 impact factor was analyzed in this study. Two journals had an impact factor of 5 or higher; both were published by Korean publishing agencies. In contrast, there were four journals with an impact factor between 4.0 and 4.999, all of which were published by international publishers. Seven of the 10 journals with an impact factor between 3.0 and 3.999 were published by Korean publishing agencies. The 99 remaining journals with an impact factor of 2.999 or lower showed a similar distribution of Korean and international publishers.

The publication frequency of the 115 journals was also investigated. The plurality of journals (50) adopted a bi-monthly schedule, followed by a quarterly schedule, which was adopted by 37 journals. Next, 21 journals adopted monthly schedule. Each of the three journals adopted semi-monthly and Tri-annual. One journal adopted annual schedule.

Basic journal information

Table 1 indicates the results of the analysis of the 59 academic journals published by Korean publishing agency in terms of the availability of basic journal information.

Most of the journals analyzed in this study presented well the most of the basic journal information. However, nine of the 59 journals only presented broad statements regarding their aims and scope, but did not specify the main readership. Journals should provide detailed information of article processing charges and publishing costs, and if the author is not responsible for these costs, that information should be specified on the journal's webpage. However, eight journals did not provide information on the costs related to submission and publishing on the webpage. The results for whether basic journal information was indicated (in terms of “yes” or “no”) are shown in Fig. 1. Journals should state on their webpage whether there is a peer review process before a submitted manuscript is published and should specify the detailed procedures involved in the peer review process. Eight journals provided specific information on the peer review process. Of the 59 journals, 51 did not describe the peer review process in detail on their webpage. Two journals indicated that they utilized single-blind reviewing, in which the reviewer knows who the author is, while the author is not given the reviewer’s information. Six journals indicated that they used a double-blind policy, in which neither the reviewers nor the authors are given each other’s information during the peer review process.

Copyright and archiving information

Results for copyright and licensing information, method of access, and archiving conditions are presented in Table 2 and Fig. 2.

According to the “Principles of transparency and best practice in scholarly publishing,” journals should clearly indicate their policies regarding the use of third-party repository services such as preprint servers or affiliated universities or societies where authors can deposit their articles before submission. However, only six of the 59 journals specified information regarding this item. Furthermore, in light of the increasing number of academic journals that are only published online, it is necessary to indicate plans for electronic backup or archiving of past publications in case the academic journal is
discontinued. However, only 47 of the 59 journals provided information on electronic backup plans and archiving. The most common repository for Korean journals was PMC, which 44 journals utilized. Six journals deposited publications in ScienceCentral, one in KoreaScience, and one in the National Library of Korea.

**Table 1. Basic journal information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Sub-item</th>
<th>Count of ‘yes’</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website</td>
<td>Aims and scope</td>
<td>59</td>
<td>100</td>
<td>Statement of the purpose and scope of the academic journal</td>
</tr>
<tr>
<td></td>
<td>Readership</td>
<td>50</td>
<td>84.7</td>
<td>Clear statement of the main target readers</td>
</tr>
<tr>
<td></td>
<td>Authorship criteria</td>
<td>58</td>
<td>98.3</td>
<td>Determination of authorship, prohibition of duplicate submissions or publications</td>
</tr>
<tr>
<td>Name of journal</td>
<td>Print ISSN and electronic ISSN</td>
<td>59</td>
<td>100</td>
<td>Clear indication of the pISSN or eISSN</td>
</tr>
<tr>
<td></td>
<td>Uniqueness of name</td>
<td>59</td>
<td>100</td>
<td>A distinctive title of the journal, so that a reader would not be confused or misled regarding its association with other academic journals</td>
</tr>
<tr>
<td>Peer review process</td>
<td>Statement of review process</td>
<td>59</td>
<td>100</td>
<td>Statement indicating that a peer review process takes place before a submitted manuscript is published</td>
</tr>
<tr>
<td></td>
<td>Methods of peer review</td>
<td>8</td>
<td>13.5</td>
<td>Description of all policies and procedures related to the peer review process</td>
</tr>
<tr>
<td></td>
<td>No guarantee of manuscript acceptance</td>
<td>59</td>
<td>100</td>
<td>No guarantee of approval to publish or a highly expedited review process</td>
</tr>
<tr>
<td>Ownership and management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governing body</td>
<td>The full names and affiliations of the journal’s editorial board</td>
<td>59</td>
<td>100</td>
<td>Indication of ownership and management information</td>
</tr>
<tr>
<td>Editorial team/ contact information</td>
<td></td>
<td>59</td>
<td>100</td>
<td>Editing or operating committees consisting of experts in topics commensurate with the scope of the academic journal, with disclosure of the names and affiliations of committee members</td>
</tr>
<tr>
<td>Author fees</td>
<td></td>
<td>52</td>
<td>88.1</td>
<td>Clear statement of the cost of publishing; if the author is not responsible for the cost, this fact should also be indicated</td>
</tr>
<tr>
<td>Publishing schedule</td>
<td></td>
<td>59</td>
<td>100</td>
<td>Clear indication of the frequency or interval of publishing</td>
</tr>
</tbody>
</table>

ISSN, International Standard Serial Number; pISSN, print ISSN; eISSN, electronic ISSN.

**Fig. 1.** Twelve items in the category of basic journal information (X-axis) were investigated on 59 journals’ websites. If an item was clearly indicated, it was marked as ‘yes.’ If not, it was marked as ‘no.’ ISSN, International Standard Serial Number.
Of the 59 journals, 55 adopted a Creative Commons License. Most of these journals (53) adopted a CC BY-NC license (This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they do not have to license their derivative works on the same terms.), which allows usage for non-commercial purposes after acknowledging the holder of the intellectual rights. One journal adopted a CC-BY-ND policy (This license lets others reuse the work for any purpose, including commercially; however, it cannot be shared with others in adapted form, and credit must be provided to you.), and the remaining one adopted CC BY-SA (This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms.).

**Publication ethics information**
The results for publication ethics are presented in Table 3 and Fig. 3. Twenty-four journals specified provisions regarding complaints and appeals, 12 journals indicated policies regarding data sharing, and only six journals presented details on post-publication discussion policies. These three items had the poorest levels of compliance among the items dealing with publication ethics.

**Profit model information**
The results for publication models are shown in Table 4 and Fig. 4. Only three journals presented details on the revenue structure of the journal. Compliance with providing information on the profit model was weaker than in other areas.
Discussion

We found that the 59 Korean academic journals analyzed in this study showed poor compliance with similar aspects of the “Principles of transparency and best practice in scholarly publishing” as we identified in 781 journals worldwide in our study in 2019 [8]. Korean journals showed relatively good compliance in the areas of readership, author fees, Committee on Publication Ethics’ guideline, and archiving. However, weak areas included data sharing and reproducibility (20.3%),
policies on posting accepted articles with third parties (10.2%), and the profit model (5.1%) as shown in Table 5. Therefore, in this section, we review how international journals are complying with the "Principles of transparency and best practice in scholarly publishing" in these areas, and then suggest strategies for improvement for Korean journals.

Data sharing and reproducibility

It can be difficult for readers to identify missing data or data entry errors if raw data are not made available. Conversely, if the raw data are available, it may enable other researchers to rectify any errors at a later date, or to conduct more in-depth research using the existing raw data. When we reviewed an article that analyzed the effects of data sharing policies after classifying them into four categories by strength [9], the availability and accessibility of the data were up to 25 times higher for academic journals with a sharing policy compared to journals without a data sharing policy. Compared to journals with no sharing policy, the accessibility of the data was 17 times higher for journals with a mandatory data sharing policy with no requirement for a data accessibility statement and 974 times higher for those with a mandatory sharing policy with a requirement to include a data accessibility statement. Therefore, we can conclude that codifying a data sharing policy in the submission guidelines is tremendously effective for facilitating data sharing.

The British Ecological Society fully implemented a data sharing policy in 2014. Before adopting the policy, the society made efforts to elicit consensus among researchers for the new policy through prior promotion beginning in 2012, and a pilot implementation in 2013. The society provided diverse archiving options to alleviate the burdens placed upon researchers, and minimized complaints from the researchers by employing a flexible embargo period. It was observed that 42% of archived data were stored in Dryad, sponsored by the British Ecological Society, followed by Wiley Online Library, which retained 28% of the data; 24% of the data were archived

Table 4. Profit model information

<table>
<thead>
<tr>
<th>Item</th>
<th>Sub-item</th>
<th>Count of ‘yes’</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit model info</td>
<td>Revenue sources</td>
<td>3</td>
<td>5.1</td>
<td>Clear disclosure of the business model or revenue sources (e.g., author fees, subscriptions, advertising, reprints, institutional support, and organizational support)</td>
</tr>
<tr>
<td></td>
<td>Advertising</td>
<td>3</td>
<td>5.1</td>
<td>Specification of advertisement policies, including which forms of advertisement are considered, the person in charge of determining whether advertisements are accepted, and the method of exposure (random or showing specific advertisements based on readers’ usage patterns)</td>
</tr>
<tr>
<td></td>
<td>Direct marketing</td>
<td>3</td>
<td>5.1</td>
<td>All direct marketing activities must be appropriate, well-targeted, and unobtrusive</td>
</tr>
</tbody>
</table>

Table 5. Comparison of poorly practiced items by Korean society journals and international society journals

<table>
<thead>
<tr>
<th>Item</th>
<th>Sub-item</th>
<th>International (%)</th>
<th>Korea (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic journal info</td>
<td>Readership</td>
<td>32.1</td>
<td>84.7</td>
</tr>
<tr>
<td>Copyright and archiving info</td>
<td>Policies on posting accepted articles with third parties</td>
<td>40.6</td>
<td>10.2</td>
</tr>
<tr>
<td>Publication ethics info</td>
<td>Archiving</td>
<td>34.0</td>
<td>79.7</td>
</tr>
<tr>
<td></td>
<td>COPE’s guideline</td>
<td>38.3</td>
<td>76.3</td>
</tr>
<tr>
<td></td>
<td>Data sharing and reproducibility</td>
<td>28.7</td>
<td>20.3</td>
</tr>
<tr>
<td></td>
<td>Post-publication discussion</td>
<td>42.9</td>
<td>10.2</td>
</tr>
<tr>
<td>Profit model info</td>
<td>Revenue sources</td>
<td>20.0</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Advertising</td>
<td>35.9</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Direct marketing</td>
<td>25.3</td>
<td>5.1</td>
</tr>
</tbody>
</table>

COPE, Committee on Publication Ethics.
Status of compliance with best practice of Korean society journals

in other repositories, including public repositories [10].

Hence, the webpages of Korean academic journals must express the importance of depositing research data and provide detailed information on the procedures through which researchers can deposit their data. It is also vital to minimize authors’ discontent by allowing a sufficient phase-in period to promote awareness of the new policy, adopting a flexible embargo policy, and utilizing an extensive selection of repositories so that authors can freely choose their preferred repository.

Policies on posting accepted articles with third parties

If a CC-BY license is adopted, users can reproduce, distribute, and modify content (e.g., by producing a secondary adaptation), even for commercial purposes, without explicit consent as long as they comply with the condition of explicitly specifying the holder of the intellectual property rights. This means that a CC-BY licensing policy allows free reuse of a scholarly article under the condition of crediting the original author, which is the closest policy to the concept of open access. Complete open access journals permit authors to archive all forms of articles, regardless of the format, on all repositories and websites without delay. It is a common practice for international academic journals to employ procedures to automatically deposit articles to PMC if the research was supported by public funding. It is common to outline the process through which publishers deposit articles to a public repository after a certain embargo period lapses or upon request. Such automatic deposit procedures enable more effective and immediate public access to articles based on public research funding.

International publishers of academic journals publish information on intellectual property rights and open access policies regarding the journals they print through SHERPA/RoMEO, a platform sponsored by JISC for open archives. SHERPA/RoMEO breaks down recommendations according to whether an entity holds intellectual property rights based on four categories of archiving (preprints only, postprints only, both preprints and postprints, and the publisher’s version [PDF]), five locations of archiving (public e-print server, non-profit server, author’s or employer’s website only, author’s or institutional server only, or author’s personal website), and six types of archiving conditions (publisher’s copyright and source must be acknowledged, published source must be acknowledged, must link to publisher version, publisher’s version/PDF cannot be used, publisher’s version/PDF may be used and in compliance with any embargoes) [11].

Renowned open access journals such as PLoS One are registered as green journals in SHERPA/RoMEO, as they allow archiving of preprints, postprints, and publisher’s versions/PDFs. The author holds the intellectual property rights and adopts a CC-BY license. A source must be cited when it is referenced. A preprint version by the author can be archived on the preprint server, and when the article is posted, the final PDF version is automatically deposited in PMC [11].

The Journal of the American Chemical Society, a premier academic journal published by the American Chemical Society, is classified as a white journal in SHERPA/RoMEO. To archive a preprint version of an article, written approval from the journal’s editor is required, and it must not violate the ethics rules of the American Chemical Society. If the postprint version is required to be archived due to the policies of funding institutions or affiliated institutions, archiving may be performed after a 12-month embargo. Under no circumstances is the publisher’s version or PDF file is allowed to be archived. A preprint version of an article may be archived on a preprint server, institutional website, institutional repository, or subject repository, and it must be linked to the publisher’s version [11].

As each academic journal has unique operational or managerial circumstances reflecting its respective scholarly society, it is imperative for academic journals to clearly stipulate their policies regarding archiving of preprint articles and post-deposit of postprint articles using various international precedents that can be retrieved from SHERPA/RoMEO. Moreover, it is important to register a deposit policy on the webpage of SHERPA/RoMEO after establishing self-archiving or post-deposit policies, so that they are readily available for international authors to access.

Revenue sources, advertising, and direct marketing

Publishing is an integral activity of academic societies, and the revenue from publishing is generally used to support other society activities [12]. The sources of revenue of an academic society (e.g., submission fees, subscription fees, advertisements on the webpage or in printed journals, reprints, and support from institutions or organizations) should be clearly stated on the journal’s webpage. Authors should receive a clarification that the sources of revenue and publishing processes are completely independent, and that revenue sources do not affect editorial decisions. Additionally, authors should be informed that the review process is not affected by whether authors are required to pay publishing fees or such requirements are waived.

Advertisement policies should also be stated on the webpage. Advertisement policies include which advertisement formats are considered, who accepts advertisements, and how advertisements are shown (either presented to users based on their usage patterns or randomly). Advertisements must not be related to the decision-making process of the editorial committees under any circumstances or in any way. They also
must not be related to the content of the articles. All direct marketing efforts, such as manuscript solicitation, must be appropriate, well-targeted, and unobtrusive. Information on the publisher and journal must be presented clearly and truthfully, in a way that does not mislead readers and authors.

Among the 59 journals analyzed in this study, only three—Clinical and Experimental Otorhinolaryngology, Diabetes & Metabolism Journal, and World Journal of Men’s Health—clearly included such provisions. However, we believe that other academic journals may easily add similar clarifications to their policies based on the following information section about the revenue structure of World Journal of Men’s Health (Fig. 5) [13].

**Limitations**

The major limitation of this study stems from the fact that it was conducted only through an analysis of journals’ webpages. If a journal’s webpage, including the instructions for authors, did not include certain information, we determined that the journal did not employ best practice. We could not distinguish journals that did in fact comply with the “Principles of transparency and best practice in scholarly publishing,” but had not updated their policies on their webpage. Hence, a sensible next step would be to derive more accurate findings through a questionnaire survey administered to journal editors or through in-depth interviews with journal editors on the barriers that prevent journals from following the “Principles of transparency and best practice in scholarly publishing.”
Conclusion
In this study, we analyzed compliance with the newly revised “Principles of transparency and best practice in scholarly publishing” for 59 Korean academic society–published journals listed in the Science Citation Index Expanded with Korean publishing agents. The aspects that require the most urgent improvements in Korean academic journals are publishing ethics, self-archiving, content preservation policies for electronic journals, and notification of the journal’s revenue structure. The editors of Korean academic society–published journals may be able to adapt to the fast-changing publishing environment by improving aspects of their practice that are non-compliant with the “Principles of transparency and best practice in scholarly publishing.” Moreover, it may be necessary for associations such as the Korean Council of Science Editors to offer regular educational programs for the editors of Korean academic journals on a more frequent basis, as well as to embark upon more activities to raise awareness of these changes in guidelines.

Conflict of Interest
No potential conflict of interest relevant to this article was reported.

Data Availability
Dataset is available from the Harvard Dataverse at: https://doi.org/10.7910/DVN/MSSJD0.


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11. SHERPA/RoMEO. Publisher copyright policies & self-archiving [Internet]. [place unknown]: SHERPA/RoMEO [cited 2019 Dec 30]. Available from: http://www.sherpa.ac.uk/romeo
Characteristics of retracted articles based on retraction data from online sources through February 2019

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Abstract

Purpose: Although retractions are commonly considered to be negative, the fact remains that they play a positive role in the academic community. For instance, retractions help scientific enterprise perform its self-correcting function and provide lessons for future researchers; furthermore, they represent the fulfillment of social responsibilities, and they enable scientific communities to offer better monitoring services to keep problematic studies in check. This study aims to provide a thorough overview of the practice of retraction in scientific publishing from the first incident to the present.

Methods: We built a database using SQL Server 2016 and homemade artificial intelligence tools to extract and classify data sources including RetractionWatch, official publishers’ archives, and online communities into ready-to-analyze groups and to scan them for new data. After data cleaning, a dataset of 18,603 retractions from 1,753 (when the first retracted paper was published) to February 2019, covering 127 research fields, was established.

Results: Notable retraction events include the rise in retracted articles starting in 1999 and the unusual number of retractions in 2010. The Institute of Electrical and Electronics Engineers, Elsevier, and Springer account for nearly 60% of all retracted papers globally, with Institute of Electrical and Electronics Engineers contributing the most retractions, even though it is not the organization that publishes the most journals. Finally, reasons for retraction are diverse but the most common is “fake peer review”.

Conclusion: This study suggests that the frequency of retraction has boomed in the past 20 years, and it underscores the importance of understanding and learning from the practice of retracting scientific articles.

Keywords

Academic publishing; Retraction; Scientific publication; Self-correcting capability
Introduction

Background: Retraction is described by the Committee on Publication Ethics as a mechanism for correcting the literature and alerting readers to publications that contain serious flaws or erroneous data to the extent that their findings and conclusions cannot be relied upon [1]. However, most readers and scientists regard retraction as an unfortunate negative outcome of the scientific enterprise. Retraction is seen as a source of embarrassment for all involved [2]. This is partially due to the public perceptions associated with the phenomenon: adverse consequences to the authors, wasted funds, wasted time and effort of the host institutions, and loss of the public’s trust when the reputation of science is tainted by fraud [3], to name just a few.

It is thought that retraction can be an opportunity for learning and improvement [4]. Future researchers can learn from the reasons behind retraction [5]. Publicly available retraction notices represent the fulfillment of the social responsibilities of journals and publishers [6]. Open review communities, such as PubPeer, can offer better monitoring services to keep problematic studies in check.

Specific goals: To better facilitate this truly powerful and posi-

```sql
EXAMPLE OF SQL CODE FOR DATA VALIDATION

WITH CTE AS

  SELECT *, ROW_NUMBER() OVER (PARTITION BY 
  dbToPubmedU1, OriginalPaperPubmed) AS RN 
  FROM reArticle WHERE isDupRec = 0 AND
  dbToPubmedU1, OriginalPaperPubmed = 1

UPDATE CTE SET isDupRec = 1 WHERE RN = 1

-- Detect the documents that have titles with a similarity (more than 90%) select * from reArticle as aa where exists (select 1 from reArticle as bb where 
  dbToCalculateSimilarity(lower(aa.ArticleTitle), lower(bb.ArticleTitle)) > 0.9 
  and aa.Id < bb.Id)

C# CODE FOR WEB CRAWLING AND PARSING

string htmlText = string.Empty;
htmlText = WebDriverHelper.BrowseForTag(ur, By.XPath(valid), 20);
if (!string.IsNullOrWhiteSpace(htmlText) &&
    htmlText.Contains(token["NotFoundTest"], StringComparison.OrdinalIgnoreCase))
{
    if (maxPage == 1)
    {
        maxPage = ParseHelper.ParseMaxPage(htmlText,
            (XObject)token["MaxPageCfg"]);
    }

    XObject list = (XObject)token["listCfg"];
    string item = ParseHelper.ParseItemHtml(htmlText,
        list["list"]).ToString();

    if (!string.IsNullOrWhiteSpace(item))
    {
        var items = ParseHelper.ParseListHtml(item,
            list["item"]).ToString();

        if (items != null)
        {
            XObject itemCfg = (XObject)token["ItemCfg"];
            foreach (var ret in items)
            {
                ArticleData data = new ArticleData();
                data.ArticleTitle = ParseHelper.ParseItem(ret,
                    itemCfg["Title"], ToString());
                data.Author = ParseHelper.ParseItem(ret,
                    itemCfg["Author"], ToString());
                data.Journal = ParseHelper.ParseItem(ret,
                    itemCfg["Journal"], ToString());
                data.OrID = ParseHelper.ParseItem(ret,
                    itemCfg["Orid"], ToString());
                data.RetractID = ParseHelper.ParseItem(ret,
                    itemCfg["RetractID"], ToString());
                data.Date = ParseHelper.ParseDate(ret,
                    itemCfg["PubDate"], ToString());
                data.RetractDate = DateTime.Parse(ret,
                    itemCfg["RetractDate"], ToString());
            }
        }
    }
}```

Fig. 1. An example of code used.
tive function of retraction, a comprehensive database of retraction will be highly beneficial. Useful insights can be drawn from retraction data by asking questions. How old is the phenomenon? Are some specific publishers/journals more prone to retraction? Are retractions concentrated in certain fields? When did retractions begin to become more visible to the world? How long does it take for a journal to issue a retraction? Hence, by extracting insights from a homemade retraction database, of which the sources were RetractionWatch, official publishers’ archives, and online communities, we aimed to answer the above questions and provide suggestions for changes in scientific publishing. By doing so, we can make use of the wisdom of the retracted papers and avoid issues associated with retraction altogether in the future.

**Methods**

**Ethics statement:** No informed consent was required because this is a literature-based study.

**Study design:** This is a descriptive study that utilized database analysis.

**Setting:** A rise in scholarly publication retractions has been seen in recent years, according to sources of information such as RetractionWatch and publishers’ retraction notices, which have fostered open discussions of retracted publications categorized by author, country, journal, subject, and type [7,8]. Yet, the large amounts of data stored in different systems may easily lead to omissions in results obtained by searching manually.

To bolster the value of retraction data, we embarked on a project to replicate data retrieved from online platforms, such as RetractionWatch, online journal archives, and online discussion communities. We scanned retractions that these sources may have missed, then stored the data in a database. We built this database using SQL Server 2016 (Microsoft, Seattle, WA, USA) and employed a web crawler tool to scan the data (see the file retractionCrawler (code).pdf at https://osf.io/7ahsn/ in [9] for the code for the web crawler tool).

Then, articles collected by the web crawler tool were cleaned and assessed for duplication using the DOI and PubMed databases.

Additionally, a fuzzy matching Levenshtein distance algorithm was used to find articles that had titles with a similarity of more than 90% (see file and validData (code).pdf at https://osf.io/c2zvj/ in [9] for the code for data validation). A code snippet is provided in Fig. 1.

After we eliminated 430 duplicate and incorrect records, the dataset contained 18,603 retractions, covering 127 research fields, from 1753 (when the first retracted paper was

<table>
<thead>
<tr>
<th>Table 1. The list of the ten oldest retracted articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of retraction</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>June 24, 1756</td>
</tr>
<tr>
<td>April 1, 1927</td>
</tr>
<tr>
<td>December 1, 1940</td>
</tr>
<tr>
<td>February 1, 1942</td>
</tr>
<tr>
<td>October 1, 1966</td>
</tr>
<tr>
<td>February 24, 1977</td>
</tr>
<tr>
<td>February 24, 1977</td>
</tr>
</tbody>
</table>
published) to February 2019. Raw data for the dataset of 18,603 retractions covering 127 research fields from 1753 until February 2019 are available in both .csv and .xlsx format in the files named retraction_18603.csv (https://osf.io/2kymw/) [10] and retraction_18603.xlsx (https://osf.io/a2w8h/), respectively [11]. The dataset, code examples, and all figures are stored and publicly available in the OSF system [9].

**Statistical methods:** Having organized the dataset, we then

### Table 2. The 10 retracted articles with the longest interval between publication and retraction

<table>
<thead>
<tr>
<th>Date of retraction</th>
<th>Date of publication</th>
<th>Duration (yr)</th>
<th>Bibliographic info of the retracted article</th>
</tr>
</thead>
</table>

**Fig. 2.** Number of retracted articles per year since 1999.
<table>
<thead>
<tr>
<th>Year</th>
<th>Total no.</th>
<th>No. of publishers</th>
<th>No. of journals</th>
<th>No. of countries</th>
<th>No. of fields</th>
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</thead>
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<td>19</td>
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<td>2003</td>
<td>83</td>
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<td>60</td>
<td>29</td>
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<td>2004</td>
<td>122</td>
<td>44</td>
<td>88</td>
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<td>567</td>
<td>68</td>
<td>112</td>
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<tr>
<td>2013</td>
<td>997</td>
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<td>626</td>
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<tr>
<td>2014</td>
<td>891</td>
<td>142</td>
<td>609</td>
<td>82</td>
<td>106</td>
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<td>2015</td>
<td>1,414</td>
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<td>797</td>
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<td>2016</td>
<td>1,547</td>
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<td>2017</td>
<td>1,362</td>
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<td>113</td>
</tr>
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<td>80</td>
<td>110</td>
</tr>
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<td>2019</td>
<td>67</td>
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<td>50</td>
<td>19</td>
<td>56</td>
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<td>7,613</td>
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</table>
### Table 4. Publishers with the largest number of retracted papers

<table>
<thead>
<tr>
<th>Publisher</th>
<th>Total no. of retracted papers</th>
<th>No. of journals with retractions</th>
<th>No. of fields with retractions</th>
<th>Start year</th>
<th>Recent year</th>
</tr>
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<tbody>
<tr>
<td>Institute of Electrical and Electronics Engineers</td>
<td>6,763</td>
<td>174</td>
<td>109</td>
<td>2002</td>
<td>2018</td>
</tr>
<tr>
<td>Elsevier</td>
<td>2,438</td>
<td>877</td>
<td>114</td>
<td>1971</td>
<td>2019</td>
</tr>
<tr>
<td>Springer</td>
<td>1,368</td>
<td>609</td>
<td>110</td>
<td>1940</td>
<td>2019</td>
</tr>
<tr>
<td>Wiley</td>
<td>987</td>
<td>399</td>
<td>104</td>
<td>1977</td>
<td>2019</td>
</tr>
<tr>
<td>Taylor and Francis</td>
<td>486</td>
<td>283</td>
<td>111</td>
<td>1927</td>
<td>2019</td>
</tr>
<tr>
<td>American Society for Biochemistry and Molecular Biology</td>
<td>305</td>
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<td>42</td>
<td>1992</td>
<td>2019</td>
</tr>
<tr>
<td>SAGE Publications</td>
<td>297</td>
<td>113</td>
<td>93</td>
<td>1999</td>
<td>2019</td>
</tr>
<tr>
<td>Wolters Kluwer</td>
<td>252</td>
<td>105</td>
<td>70</td>
<td>1986</td>
<td>2019</td>
</tr>
<tr>
<td>BioMed Central</td>
<td>211</td>
<td>80</td>
<td>64</td>
<td>2001</td>
<td>2017</td>
</tr>
<tr>
<td>American Chemical Society</td>
<td>179</td>
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<td>47</td>
<td>1995</td>
<td>2019</td>
</tr>
<tr>
<td>Hindawi</td>
<td>175</td>
<td>74</td>
<td>75</td>
<td>2007</td>
<td>2019</td>
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<tr>
<td>PLoS</td>
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<td>69</td>
<td>2007</td>
<td>2019</td>
</tr>
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<td>Nature Publishing Group</td>
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<td>55</td>
<td>1977</td>
<td>2018</td>
</tr>
<tr>
<td>Oxford Academic</td>
<td>131</td>
<td>73</td>
<td>74</td>
<td>1990</td>
<td>2019</td>
</tr>
<tr>
<td>International Union of Crystallography</td>
<td>130</td>
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<td>7</td>
<td>2009</td>
<td>2012</td>
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<tr>
<td>National Academy of Sciences</td>
<td>121</td>
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<td>41</td>
<td>1982</td>
<td>2018</td>
</tr>
<tr>
<td>American Association for Cancer Research</td>
<td>121</td>
<td>7</td>
<td>27</td>
<td>1992</td>
<td>2019</td>
</tr>
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<td>Lippincott Williams &amp; Wilkins</td>
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<td>2019</td>
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<td>109</td>
<td>46</td>
<td>61</td>
<td>1995</td>
<td>2017</td>
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<td>American Association for the Advancement of Science</td>
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<td>42</td>
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<td>94</td>
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<td>2019</td>
</tr>
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<td>2018</td>
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<tr>
<td>Cell Press</td>
<td>78</td>
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<td>2018</td>
</tr>
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<td>Mary Ann Liebert</td>
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<td>1989</td>
<td>2018</td>
</tr>
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<td>American Heart Association</td>
<td>73</td>
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<td>1982</td>
<td>2018</td>
</tr>
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<td>American Association of Immunologists</td>
<td>58</td>
<td>2</td>
<td>21</td>
<td>1987</td>
<td>2017</td>
</tr>
<tr>
<td>e-Century Publishing Corporation</td>
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<td>34</td>
<td>2013</td>
<td>2019</td>
</tr>
<tr>
<td>Cambridge University Press</td>
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<td>1982</td>
<td>2018</td>
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<td>American Physiological Society</td>
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<td>2018</td>
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<td>2018</td>
</tr>
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<td>2018</td>
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<td>2008</td>
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<td>2005</td>
<td>2018</td>
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<td>42</td>
<td>2012</td>
<td>2018</td>
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<td>MDPI</td>
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<td>51</td>
<td>2010</td>
<td>2019</td>
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<td>2006</td>
<td>2019</td>
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<td>1980</td>
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<td>42</td>
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<td>34</td>
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<td>15</td>
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<td>2018</td>
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<td><strong>Total</strong></td>
<td><strong>18,601</strong></td>
<td><strong>4,507</strong></td>
<td><strong>5,817</strong></td>
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</table>
calculated descriptive statistics to present a clear overview of the practice of retraction in scientific publishing.

**Results**

Retractions were found in 4,289 journals belonging to 753 publishers (or publishing organizations). From the analysis of data through February 2019, 18,603 retractions were found. In the past, this phenomenon was rare. Table 1 presents information regarding the 10 oldest retracted articles, with the oldest dating back to 1756. The next recorded retraction occurred in 1927; following that, retractions were typically recorded as taking place every several years. The first five articles on this list are not accessible because no digitized document is available.

The increasing number of retractions in recent years [12] may also reflect trends in time to retraction (the time from the publication of the article to the publication of the retraction note) [4]. We measured the time to retraction for the 10 articles with the longest time to retraction, and the longest interval before retraction was 80 years (Table 2). Four of the 10 articles listed below are not available online.

Although the first retraction was issued in 1756, retraction only began to become more common in 1999, as shown in Fig. 2, with 2010 being an anomaly.

The number of retractions and the numbers of publishers, journals, countries, and fields in which retraction decisions were made per year are reported in Table 3. Despite the increase in journals issuing retractions in recent years, the number of retractions per retracting journal has not increased. As shown in Table 3, in 2010, 4,867 papers were retracted by 401 journals or publications associated with 92 publishers. The authors of articles retracted that year came from 70 different countries, and their papers covered 118 research fields.

Among the 753 publishers with retracted papers, the highest number of papers belonged to the Institute of Electrical and Electronics Engineers (IEEE), with 6,763 retracted articles. Elsevier had the most journals that have had papers retracted: 877 journals covering 114 research fields. The IEEE, Elsevier, and Springer accounted for 56.81% (10,569 of 18,603) of all retracted papers globally. Basic data concerning the publishers with the most retractions are given in Table 4.

Fig. 3 illustrates the distribution of the number of retracted papers by journal impact factor. It indicates that 7,836 out of 18,603 papers were published in journals with a JIF, of which more than three-fourths were published in jour-
nals with a JIF of 5 or lower.

Data regarding retractions of papers in various fields are shown in Fig. 4.

China ranked first in the top 15 countries by number of retracted articles, as presented in Table 5.

A closer look at the top five countries showed a spurt in the retractions of articles by Chinese authors around 2010, as depicted in Figs. 5 and 6.

### Table 5. Top 15 countries by number of retracted articles

<table>
<thead>
<tr>
<th>Country</th>
<th>Total no. of retracted articles</th>
<th>No. of publishers</th>
<th>First year articles were counted</th>
<th>Most recent year articles were counted</th>
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<td>2019</td>
</tr>
<tr>
<td>United States</td>
<td>3,179</td>
<td>237</td>
<td>1927</td>
<td>2019</td>
</tr>
<tr>
<td>India</td>
<td>934</td>
<td>130</td>
<td>1992</td>
<td>2019</td>
</tr>
<tr>
<td>Japan</td>
<td>874</td>
<td>126</td>
<td>1986</td>
<td>2019</td>
</tr>
<tr>
<td>Germany</td>
<td>623</td>
<td>94</td>
<td>1940</td>
<td>2019</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>593</td>
<td>96</td>
<td>1756</td>
<td>2019</td>
</tr>
<tr>
<td>Iran</td>
<td>582</td>
<td>69</td>
<td>2005</td>
<td>2019</td>
</tr>
<tr>
<td>South Korea</td>
<td>520</td>
<td>112</td>
<td>1999</td>
<td>2019</td>
</tr>
<tr>
<td>Italy</td>
<td>434</td>
<td>92</td>
<td>1994</td>
<td>2019</td>
</tr>
<tr>
<td>Canada</td>
<td>307</td>
<td>63</td>
<td>1982</td>
<td>2018</td>
</tr>
<tr>
<td>Taiwan</td>
<td>302</td>
<td>45</td>
<td>1993</td>
<td>2019</td>
</tr>
<tr>
<td>France</td>
<td>301</td>
<td>64</td>
<td>1985</td>
<td>2019</td>
</tr>
<tr>
<td>Spain</td>
<td>258</td>
<td>70</td>
<td>1999</td>
<td>2019</td>
</tr>
<tr>
<td>Australia</td>
<td>254</td>
<td>66</td>
<td>1982</td>
<td>2018</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>222</td>
<td>51</td>
<td>1990</td>
<td>2018</td>
</tr>
</tbody>
</table>

**Fig. 5.** Top five countries according to the number of retracted articles by year.

### Discussion

**Key results:** RetractionWatch is among the few databases tracking retractions exclusively on the global scale; hence, making the best use of this resource can greatly benefit the scientific community. Recognizing this fact, we have collected a comprehensive database on scientific retractions from 1753 to February 2019 using SQL Server 2016 and homemade arti-
official intelligence tools. This database enabled us to answer the questions posed in this paper. We found that although retraction is an old phenomenon, with the first retraction of a paper dating back to 1756 (Table 1); it became a common practice in 1999, and the most retractions were issued in 2010.

Moreover, the longest duration that a retracted paper stayed in the literature was 80 years (Table 2). Most notably, the IEEE, Elsevier, and Springer together accounted for nearly 60% of all retracted papers, with the IEEE accounting for the most. Of the reasons for retraction, “fake peer review” was the most common. Additionally, our database noted a sharp rise in the number of retracted papers from China (Table 5). These insights suggest that future studies can continue to explore various aspects of retractions.

Interpretation: This rise of retraction that began in 1999 (as shown in Fig. 2) is nearly consistent with the findings of Brembs et al., which concluded that the retraction rate of articles had remained stable since the 1970s and began to increase rapidly in the early 2000s. They also saw the creation and popularization of a website dedicated to monitoring retractions in 2010 [13]. However, this increase may be a sign that journal editors are becoming more skillful at identifying and removing flawed publications [14].

Diverging from previous results that held that journals with higher impact factors have a higher rate of retractions [15], our finding showed an non-significant correlation between JIF and the probability of article retraction (Fig. 3). This result is consistent with Singh et al. [3], who found a statistically non-significant relationship between the impact factor and the number of articles retracted. Different fields also had different numbers of retracted papers (Fig. 4). The majority of retractions were associated with business and technology, physical sciences, basic life science, and the health sciences. Meanwhile, the social sciences, humanities, environmental science, and publishing accounted for a small portion of all retractions. The relationships among retractions in different fields is also presented in Fig. 4. For instance, basic life sciences and health sciences had a significant number of shared retracted articles. In fields with few retractions, most of the retracted articles were shared with fields with high numbers of retractions.

The reasons for retraction can be diverse, and one paper is usually retracted for multiple reasons [4,7]. Since 2012, “fake peer review” has become a major reason, with 676 retractions for that reason during the last 7 years. About 30% (5,602) of retracted papers had undergone some investigation (Office of Research Integrity official investigation, investigation by a third party, investigation by a company/institution, or investigation by a journal/publisher) before being retracted. The findings of Qi et al. [8] also indicate that the number of retractions due to fake peer review differs among journals and countries; a majority (74.8%) of retracted papers were determined to be written by Chinese researchers.

This result may be due to China’s current national situation (Table 5 and Figs. 5, 6). Greater amounts of funding and awards for conducting scientific research make researchers more eager to publish; however, measures to enforce publishing ethics may not have caught up [8]. However, it is important to note that when considering the number of retractions per publication and the amount of research funding, respectively, Iran and Romania are the top countries [16].

Limitation: This article is not exempt from limitations. First,
this study mainly employed descriptive statistics, which serve only to provide an overview and do not dive into any specific issue. Thus, future studies should make use of the resources provided by this report and focus on tackling specific problems, such as reasons for retraction or case studies of publishers or countries. Different statistical approaches, such as frequentist statistics [17] or Bayesian statistics [18], should be used. Analyses of these specific topics using different statistical methods will yield a more in-depth understanding of the practice of retraction. Second, due to paywalls, our artificial intelligence tools were unable to scan beyond basic information unless the retracted articles were open-access and available in HTML format. Similarly, this study used the 2017 JIF, also because of an accessibility issue. In the future, new technology and open-access policies of publishers may enable us to access more information.

With regard to lessons that can be learned from the above findings, what we present is only a macro-level view of the entire practice of retraction. The data, when organized and analyzed properly, will be much more useful for various stakeholders. As an example, the story of China and the drastic 2010 peak in retracted articles suggest that countries that are newcomers to the academic world should take care to avoid getting too caught up in productivity boosts, particularly in developing countries, where policy failure can be extremely consequential [19]. The provision of science financing and grants is, of course, a welcome action on the part of the government [20]; however, science policies ought not to incentivize researchers to sacrifice quality for quantity. In the face of the increase in the frequency of retractions across all fields in global academia, nurturing a culture of honesty and humility is just as important as output. Editors and publishers, as well as researchers and policy-makers, have something to learn from the story of retraction. Publishers can hold the key to mitigating the fierce competition on a playing field often leveled against emerging countries, thus supporting more sustainable practices in scientific publishing [21].

**Conclusion:** In essence, science is a continuous process of trial and error, and only by accepting the possibility of failure can a scientist make progress [22]. Thus, this study offers an overview of retraction offered from various perspectives, in which the data was examined with regard to articles, publishers, fields, and countries. This overview suggests that retraction has boomed in the past 20 years, and that the lessons that can be learned from retractions must be taken more seriously.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

**Data Availability**

Raw data for the dataset of 18,603 retractions covering 127 research fields from 1753 until February 2019 are available in both .csv and .xlsx format under the files named retraction_18603.csv (https://osf.io/2kymw/) and retraction_18603.xlsx (https://osf.io/a2w8h/), respectively. The dataset, code examples, all figures, and other files are deposited and publicly available in OSF (https://osf.io/pbwv3/).

**Acknowledgments**

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Bibliographic and content analysis of articles on education from Vietnam indexed in Scopus from 2009 to 2018

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Abstract
Purpose: This study aimed to analyze the bibliographic characteristics and content of articles on education published in Scopus-indexed journals by authors with Vietnamese affiliations from 2009 to 2018.
Methods: Scopus was searched on July 6, 2019 using the search option “affiliation country,” with “Vietnam OR Viet Nam” as the country name, and “subject area” as “social sciences AND education.”
Results: A total of 193 articles were identified. They were classified by publication year, co-authors’ country, affiliation, subarea, journal, and author. Content analysis of these articles demonstrated that the number of publications on education from Vietnam in Scopus increased rapidly during the last 10 years. The top five countries of co-authors were Australia, the USA, New Zealand, the UK, and the Netherlands. The main research subfields were English-language teaching, pedagogy, and educational management.
Conclusion: Although Vietnamese education researchers collaborated with colleagues in developed countries to publish papers, there was still a lack of articles discussing global trends in education, such as cross-border education, equity in education, and international assessment programs.

Keywords
Bibliography; Publications; Scopus; Education; Vietnam

Introduction
During the last 10 years, there has been a significant increase in the number of scientific articles from Vietnam published in reputed journals indexed in international literature databases, such as Web of Science and Scopus. Data from Scimago showed that over the course of the last
decade, the number of publications from Vietnam in all subject areas increased five-fold, from 1,764 papers in 2009 to 8,837 papers in 2018, which led Vietnam to increase its ranking in publications of all subject areas from the 65th position worldwide to the 50th position worldwide. However, the ranking of documents in the social sciences in general has increased less steeply—from the 65th position in 2009 to the 62nd position in 2018—and this trend also holds true for education [1]. It is often claimed in Vietnam that publishing papers on education in international journals is much more difficult than it is to publish articles in other areas such as mathematics, engineering, and business.

The aim of this study was to analyze the bibliographic characteristics and content of articles on education from Vietnam indexed in Scopus from 2009 to 2018. In this paper, we first calculated the number of articles on education published yearly for the last 10 years. We then determined which other countries the co-authors of Vietnamese researchers had affiliations in. We also investigated which higher education institutions and research institutes located in Vietnam had the most articles published. Furthermore, the Scopus-indexed journals that published papers on education authored by Vietnamese researchers were identified. Finally, we highlighted keywords frequently used in the articles and investigated how many articles were published in various subfields of education. In the Discussion, we comment on trends in international publications in education from Vietnam and propose research gaps to be addressed in future studies.

Methods

In this study, we followed the research methods successfully employed by several researchers who performed bibliometric/bibliographic and content analyses of articles in international databases. For example, in 2017, Jeong and Huh [2] published a paper presenting a bibliometric and content analysis of medical articles in the PubMed database published by North Korean authors from 1997 to July 2017. In 2018, they then analyzed the bibliometric characteristics of publications from North Korea indexed in the Web of Science Core Collection from 1978 to 2018 [3]. Most recently, Kim and Chung [4] presented the current status of physics research in North Korea through a bibliographic and content analysis of the physics papers from North Korea indexed in Scopus from 2005 to 2018. We believed that a similar research approach would be useful in this study.

We searched the Scopus database on July 6, 2019. We used the search option “affiliation country” with “Vietnam OR Vietnam” as the country name. For the search option of “subject area,” we used “social sciences,” and “education” was used to “search within results.” The results were limited by year to the period from 2009 to 2018, and the document type was limited to articles. We found 193 articles, among which 190 were in English, two were in Spanish and one was in French. We then conducted a detailed analysis of the bibliographic data, including publication year, affiliations, authors, co-authors from foreign countries, journals and keywords. Next, we downloaded the full text of all 193 articles to examine the content of each paper to understand which subfield of education it belonged to and how it contributed to the literature.

Results

Based on a bibliographic and content analysis of the 193 articles, we classified them by publication year, co-authors’ foreign country, institution, journal, keyword, and subfield.

The first finding is the trend in the number of papers published annually from 2009 to 2018. As shown in Fig. 1, there was a steady increase in the number of papers during this period. There were nearly four times as many papers published in 2018 as in 2009. The number of papers has been increasing.

Fig. 1. Changes over time in the number of published papers on education by years (2009–2018).
especially dramatically in recent years.

Almost 100 research institutions from Vietnam were found for the authors of the 193 identified papers. The institution with the largest number of papers accounted for 10.9% of the papers. Table 1 presents the top 12 institutions with the most publications in education. In addition to those on this list, 10 institutions had three publications each, and seven institutions had two publications each.

The majority of the 193 papers were written in collaboration with authors from other countries. Fig. 2 presents the top 11 countries in which the co-authors of the most education articles from Vietnam had affiliations. The main partner countries of Vietnam were Australia and the USA, which accounted for 23.8% and 16.7% of the total articles, respectively. Additionally, there were six countries with three publications each (Bangladesh, Hong Kong, Italy, India, Japan, and Taiwan), two countries with two publications each (Cambodia and South Africa), and 15 countries with one publication each, such as Germany, Singapore and South Korea. We also found that several authors used both a foreign affiliation and a Vietnamese affiliation. Such cases were counted as a co-author's affiliation with an institution in a foreign country.

Table 1. Top 12 institutions with which the authors of the most papers on education were affiliated

<table>
<thead>
<tr>
<th>Institution</th>
<th>No. of papers</th>
<th>Percentage of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam National University Hanoi</td>
<td>21</td>
<td>10.9</td>
</tr>
<tr>
<td>National Economics University Hanoi</td>
<td>12</td>
<td>6.2</td>
</tr>
<tr>
<td>Vietnam National University Ho Chi Minh City</td>
<td>11</td>
<td>5.7</td>
</tr>
<tr>
<td>Hue University</td>
<td>11</td>
<td>5.7</td>
</tr>
<tr>
<td>University of Danang</td>
<td>8</td>
<td>4.1</td>
</tr>
<tr>
<td>Ton Duc Thang University</td>
<td>8</td>
<td>4.1</td>
</tr>
<tr>
<td>Can Tho University</td>
<td>7</td>
<td>3.6</td>
</tr>
<tr>
<td>Hanoi University of Education</td>
<td>7</td>
<td>3.6</td>
</tr>
<tr>
<td>RMIT University Vietnam</td>
<td>5</td>
<td>2.6</td>
</tr>
<tr>
<td>International University, Vietnam National University Ho Chi Minh City</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td>Mekong Development Research Institute</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td>Tra Vinh University</td>
<td>4</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Fig. 2. Top 11 foreign countries in which the co-authors of the most papers on education with Vietnamese authors had affiliations.

Table 2. Top 10 foreign universities with which the co-authors of the most papers on education with Vietnamese authors were affiliated

<table>
<thead>
<tr>
<th>Institution</th>
<th>No. of papers</th>
<th>Percentage of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monash University (Australia)</td>
<td>6</td>
<td>3.1</td>
</tr>
<tr>
<td>University of Waikato (New Zealand)</td>
<td>5</td>
<td>2.6</td>
</tr>
<tr>
<td>University of Queensland (Australia)</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td>RMIT University (Australia)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>Victoria University of Wellington (New Zealand)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>La Trobe University (Australia)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>Queensland University of Technology (Australia)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>The Education University of Hong Kong (Hong Kong)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>Deakin University (Australia)</td>
<td>3</td>
<td>1.6</td>
</tr>
<tr>
<td>Chulalongkorn University (Thailand)</td>
<td>3</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Table 3. Top six authors from institutions located in Vietnam with the most education publications

<table>
<thead>
<tr>
<th>Author</th>
<th>Institution</th>
<th>No. of papers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baulch, B.</td>
<td>RMIT University Vietnam</td>
<td>4</td>
</tr>
<tr>
<td>Nguyen, C.V.</td>
<td>National Economics University Hanoi</td>
<td>4</td>
</tr>
<tr>
<td>Cuong, N.V.</td>
<td>Ton Duc Thang University</td>
<td>3</td>
</tr>
<tr>
<td>Hung, B.P.</td>
<td>Van Hien University</td>
<td>3</td>
</tr>
<tr>
<td>Lan, L.T.T.</td>
<td>University of Social and Labour Affairs</td>
<td>3</td>
</tr>
<tr>
<td>Nguyen, T.D.</td>
<td>University of Economics Ho Chi Minh City</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 4. List of journals where three or more papers on education by Vietnamese authors were published

<table>
<thead>
<tr>
<th>Journal</th>
<th>No. of papers</th>
<th>Scopus quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal of Asia TEFL</td>
<td>10</td>
<td>Q2</td>
</tr>
<tr>
<td>International Journal of Instruction</td>
<td>5</td>
<td>Q3</td>
</tr>
<tr>
<td>Australian Journal of Teacher Education</td>
<td>4</td>
<td>Q2</td>
</tr>
<tr>
<td>BMC Medical Education</td>
<td>3</td>
<td>Q1</td>
</tr>
<tr>
<td>Cogent Education</td>
<td>3</td>
<td>Q3</td>
</tr>
<tr>
<td>Cultural Studies of Science Education</td>
<td>3</td>
<td>Q1</td>
</tr>
<tr>
<td>Higher Education</td>
<td>3</td>
<td>Q1</td>
</tr>
<tr>
<td>Higher Education Research and Development</td>
<td>3</td>
<td>Q1</td>
</tr>
<tr>
<td>Journal of Development Studies</td>
<td>3</td>
<td>Q1</td>
</tr>
<tr>
<td>Quality Assurance in Education</td>
<td>3</td>
<td>Q2</td>
</tr>
<tr>
<td>Social Work Education</td>
<td>3</td>
<td>Q2</td>
</tr>
</tbody>
</table>

Table 5. Classification of keywords in Vietnamese education papers

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher education</td>
<td>16</td>
</tr>
<tr>
<td>Human/humans</td>
<td>9/8</td>
</tr>
<tr>
<td>Learning</td>
<td>8</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
</tr>
<tr>
<td>Asia</td>
<td>6</td>
</tr>
<tr>
<td>Education</td>
<td>6</td>
</tr>
<tr>
<td>Academic performance</td>
<td>5</td>
</tr>
<tr>
<td>Blended learning</td>
<td>5</td>
</tr>
<tr>
<td>Curriculum</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
</tr>
<tr>
<td>Medical school</td>
<td>5</td>
</tr>
<tr>
<td>Curriculum development</td>
<td>4</td>
</tr>
<tr>
<td>Professional development</td>
<td>4</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>4</td>
</tr>
<tr>
<td>Vocational development</td>
<td>4</td>
</tr>
<tr>
<td>Child development</td>
<td>3</td>
</tr>
<tr>
<td>Continuing education</td>
<td>3</td>
</tr>
<tr>
<td>Education policy</td>
<td>3</td>
</tr>
</tbody>
</table>

We also identified the foreign universities with which researchers from Vietnam collaborated to publish papers on education. As shown in Table 2, Australia had the largest number of the top 10 universities (with six institutions), while two of the institutions were in New Zealand and one institution each was in Hong Kong and Thailand.

We also found that no author from Vietnam had more than four education papers. Two authors had four papers each, and four authors had three papers each (Table 3).

In addition, the journals in which articles on education written by Vietnamese researchers were published were tabulated. Table 4 shows a list of 11 journals where three or more education papers by Vietnamese authors were published. The majority of these journals were considered high-quality journals in the subject area of education, with five Q1 journals and four Q4 journals. In addition to the journals on this list, there were 25 other journals in which two papers in education...
were published by authors working at research institutions located in Vietnam.

Next, we identified frequent keywords that were used in the 193 articles. Unsurprisingly, the words “Vietnam” and “Viet Nam” were used the most (64 times and 31 times, respectively). Other frequent keywords are presented in Table 5. These frequent keywords shed light on trends in research and publications in the field of education by Vietnamese authors. Additionally, however, we attempted to classify these 193 papers according to the relevant subfield of education, as shown in Table 6. The top subfield in which the largest number of articles were published was English-language teaching. Other areas of research where many articles were published included pedagogy, educational management, and gender and women’s studies.

The fact that English-language teaching accounted for the largest number of papers allows us to infer that considerable attention is paid in the Vietnamese educational system to teaching and learning English. Moreover, those who are teachers of English have an advantage in terms of their linguistic capacity to write scientific papers in English.

Discussion

The number of papers in the field of education written by authors with affiliations located in Vietnam has increased rapidly in the past 10 years. Many of these papers were published by researchers at higher education institutions that have suitable policies to promote scientific research and international publication. For example, Vietnam National University Hanoi and Ton Duc Thang University have established many research groups and allocated funding for these groups [5]. Furthermore, Australia, the USA, New Zealand, and the UK were found to be the countries with the largest number of co-authors of education papers with Vietnamese researchers. An explanation for this trend is that the above countries are those that have attracted the largest number of Vietnamese students for overseas studies [6].

In addition, through a content analysis of 193 education papers, we found that there were several papers discussing global trends in education, such as blended learning, using technology in education, and lifelong learning. However, there were not many papers focusing on other major international trends, including quality assurance, cross-border education, equity in education, and international assessment programs. Moreover, there seems to be a lack of papers investigating challenges and solutions in the current Vietnamese educational system, such as university autonomy, higher education governance, academic research competence, and education for ethnic minorities.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

References

Analysis of Korean journals rejected by Scopus since 2011

Hyunju Jang\textsuperscript{1,2}
\textsuperscript{1}Graduate School of Business, Sungkyunkwan University, Seoul; \textsuperscript{2}Research Intelligence, Elsevier Korea, Seoul, Korea

Abstract
This paper aims to provide publishers and societies who plan to apply for their journals to be listed in Scopus with critical guidelines to evaluate their performance from an objective, globally-informed perspective. It presents a qualitative case study of how applications of Korean journals to Scopus have been evaluated over a 9-year period (2011–2019). A content analysis was conducted of 106 applications that were rejected by the Content Selection and Advisory Board, according to a combination of 14 quantitative and qualitative selection criteria. This case study was used to categorize instances of failure and to illustrate practical strategies for local journals to use when applying to Scopus based on the lessons to be learned from rejected cases. The results of the analysis show that local journals should enhance the quality of the articles they publish, review why the journal should be considered international, and clearly address editorial policies and the concept, scope, and strategies of the journal.

Keywords
Scopus; Reasons of rejection; Quality of articles; International journal; Editorial policy

Introduction
Publishers and academic societies submit their journals to abstract and indexing databases (DBs) such as Scopus and Web of Science to increase their journals’ visibility and impact and to provide access to global researchers. Being listed in these abstract and indexing DBs is a critical opportunity and is a signal of achieving the status of an international journal. Inclusion in Scopus not only provides publishers and societies a sense of achievement, but also serves as an indicator that researchers have recognized the quality of a journal.

Scopus has a clearly stated selection policy, and the Content Selection and Advisory Board (CSAB), which is an international independent review board, evaluates suggestions by publishers and societies on an ongoing basis [1]. This advisory board reviews new titles based on quantitative and qualitative measures, evaluates whether the titles have sufficient scientific value and academic excellence to be indexed by Scopus, and makes a final decision of whether to...
accept or reject an application.

As the largest abstract and indexing DB of global research content, Scopus includes titles from more than 5,000 publishers globally [2]. According to statistics on active titles indexed by Scopus, 24,520 titles have been listed as of May 2019. The United States accounts for the largest amount of listed titles (6,113, 24.9%), followed by United Kingdom (5,679 titles, 23.2%), the Netherlands (2,266 titles, 9.2%), Germany (1,683 titles, 6.9%), and Switzerland (641 titles, 2.6%). With 289 titles (1.2%), Korea is ranked in the 15th place (Table 1). The indexed titles are recognized as having passed a transparent and rigorous review process.

All suggested titles should meet all five minimum criteria—peer-review, English abstracts, regular publication, references in Roman script, and a publication ethics statement—to be considered for a CSAB review. If a title meets the minimum criteria, the subject chairs of the CSAB review it according to the combination of 14 quantitative and qualitative selection criteria, including journal policies, content, journal standing, publishing regularity, and online availability [3]. In total, 5,710 titles (48%) were accepted of the 12,005 titles reviewed by the CSAB from 2011 to 2019 as of April 2019 (Fig. 1). An analysis of the titles reviewed from the top 20 countries with the most titles reviewed showed that 733 titles from the United States, 1,002 titles from the United Kingdom, 161 titles from India, and 130 titles from Korea were accepted, while 514 titles from the United States, 225 titles from the United Kingdom, 847 titles from India, and 137 titles from Korea were rejected.

### Table 1. Number of indexed titles by countries

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of journals</th>
<th>Percentage</th>
<th>Country</th>
<th>No. of journals</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>6,113</td>
<td>24.9</td>
<td>Poland</td>
<td>345</td>
<td>1.4</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5,679</td>
<td>23.2</td>
<td>South Korea</td>
<td>289</td>
<td>1.2</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2,266</td>
<td>9.2</td>
<td>Canada</td>
<td>267</td>
<td>1.1</td>
</tr>
<tr>
<td>Germany</td>
<td>1,683</td>
<td>6.9</td>
<td>Egypt</td>
<td>209</td>
<td>0.9</td>
</tr>
<tr>
<td>Switzerland</td>
<td>641</td>
<td>2.6</td>
<td>Turkey</td>
<td>187</td>
<td>0.8</td>
</tr>
<tr>
<td>Spain</td>
<td>567</td>
<td>2.3</td>
<td>Australia</td>
<td>179</td>
<td>0.7</td>
</tr>
<tr>
<td>China</td>
<td>564</td>
<td>2.3</td>
<td>Czech Republic</td>
<td>176</td>
<td>0.7</td>
</tr>
<tr>
<td>France</td>
<td>499</td>
<td>2.0</td>
<td>Romania</td>
<td>175</td>
<td>0.7</td>
</tr>
<tr>
<td>Italy</td>
<td>467</td>
<td>1.9</td>
<td>Iran</td>
<td>157</td>
<td>0.6</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>447</td>
<td>1.8</td>
<td>Croatia</td>
<td>146</td>
<td>0.6</td>
</tr>
<tr>
<td>India</td>
<td>430</td>
<td>1.8</td>
<td>Singapore</td>
<td>140</td>
<td>0.6</td>
</tr>
<tr>
<td>Japan</td>
<td>374</td>
<td>1.5</td>
<td>Belgium</td>
<td>123</td>
<td>0.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>366</td>
<td>1.5</td>
<td>Others</td>
<td>2,031</td>
<td>8.3</td>
</tr>
</tbody>
</table>

![Fig. 1. The number of reviewed titles from the top 20 countries.](https://www.escienceediting.org)
number of accepted Korean journals increased from 22 titles in 2011 to 28 titles in 2018. The acceptance rate for Korean titles during 2011-2019 was 48.7%, which is similar to the world average of 48% (Fig. 2). This study was conducted to investigate how many Korean journals were rejected in the CSAB review process, to categorize the reasons for rejection, and to provide strategic advice to editors preparing to apply to Scopus.

**Methods**

Scopus is a source-neutral abstract and indexing DB curated by independent subject matter experts [2]. Data over a 9-year period from 2011 to 2019 were collected from the Scopus Title Evaluation Team and investigated. The title, primary subject field, date of application, date of final decision, final decision (acceptance or rejection), narrative messages to publishers or societies, and the tracking ID of suggested journals from Korea were summarized. In this analysis, the author verified the evaluation results of 106 Korean titles that received specific reasons for rejection after the CSAB review. After a review of the rejection messages to publishers and societies, these different reasons could be grouped into six categories containing similar reasons. Each category can be illustrated with a detailed explanation, and in the Results section, we suggest how publishers and societies in Korea can overcome those obstacles and weaknesses.

**Results**

In this analysis, the reasons for the rejection of 106 titles by the CSAB were reviewed and classified into the following six categories: quality of articles, why a journal should be considered international, editorial policies, number of articles, delayed publication, and subject area, as summarized in Table 2. This paper focuses on three categories of reasons for rejection and presents several factors that publishers and societies should consider as they prepare to apply for inclusion in Scopus.

![Fig. 2. The number of Korean titles reviewed by year.](image)

<table>
<thead>
<tr>
<th>Reasons for rejection</th>
<th>No. of journals</th>
<th>Percentage</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of articles</td>
<td>39</td>
<td>36.8</td>
<td>Poor quality, grammar, no impact, low citations</td>
</tr>
<tr>
<td>Why the journal should be considered international</td>
<td>36</td>
<td>34.0</td>
<td>No international diversity, no geographic diversity, single-institutional journals, national and institutional journals</td>
</tr>
<tr>
<td>Editorial policies</td>
<td>17</td>
<td>16.0</td>
<td>Unclear aims and scope, concept, lack of guideline and information, lacking indications of quality control</td>
</tr>
<tr>
<td>No. of articles</td>
<td>6</td>
<td>4.7</td>
<td>Too few or too many articles</td>
</tr>
<tr>
<td>Delayed publication</td>
<td>4</td>
<td>3.8</td>
<td>Delayed publishing schedule, irregular publications</td>
</tr>
<tr>
<td>Subject area</td>
<td>4</td>
<td>3.8</td>
<td>Similar to other journals, too many journals dealing with the subject, too broad, too specific</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Quality of articles
The quality of articles published in a journal has a positive impact on the journal's overall quality and impact. Thirty-nine of the 106 rejected titles (36.8%) were rejected due to quality issues with the journal. The CSAB subject chairs indicated that poor quality of the articles, unacademic content, uneven scholarly quality of articles, poor-quality English abstracts, and low citedness of the articles were reflective of insufficient journal quality, and made a final decision of rejection.

How can we assess journal quality? In order to ensure that high-quality articles are published and to improve the quality of articles, several factors should be considered strategically. First, journals should have a rigorous peer-review policy, with many experts in the field reviewing submitted articles. Peer review plays a critical role in scholarly publishing and is designed to help improve the quality of articles and published research. Through robust peer review, publishers and societies can improve articles' quality; high-quality articles then contribute to improving journal quality, supporting the cultivation of a stable journal brand. Second, technical editing improves the accuracy and readability of research articles. To improve the accuracy and quality of articles, publishers and societies can implement a standardized process, involving a clearly defined reference style, policies on the use of abbreviations, and regularly checking articles for grammatical errors, clarity, completeness, and consistency [4]. Third, it is important to analyze the journal's citedness and to evaluate the quality of journal articles objectively. Publishers and societies can identify their journal articles' citations in publications indexed in Scopus and can compare their journal's impact to that of other titles belonging to the same subject area. Furthermore, they should evaluate the tendency of review articles and other article types to receive more citations than original articles [5] and assess who—in terms of which institutions and countries—cite journal articles. Finally, although the quality of articles is clearly critical for increasing their impact, publishers and societies should also understand the indicators used to evaluate research, the importance of international collaborations, and the challenges involved in the development of strategies for improving the quality of articles. Publishers and societies should increase the visibility of articles to attract attention from authors and researchers across the world, resulting in more opportunities to be cited by other papers. A study found that the number of downloads of articles had a clear effect on citations, because many downloads occur before a paper is cited [6].

Why a journal should be considered international
Thirty-six of the 106 titles (34.0%) were rejected for being insufficiently international. The CSAB subject chairs decided to reject 36 titles after evaluation for lacking international diversity among authors and editors, being of limited interest for a wider international audience, and taking a localized approach, as such journals fail to fulfill the requirements for inclusion in an international DB such as Scopus.

How can we define an international journal? Various arguments on this issue do not present a clearly defined distinction between international and national journals. Generally, if journals are indexed in abstract and indexing DBs such as Scopus, Web of Science, and PubMed, are published by global publishers such as Elsevier, Springer, Wiley, and Nature, and have many customers and research institutions that subscribe to the journal, they can be recognized as international journals. Before applying to Scopus, publishers and societies can assess the internationality of a journal based on several evaluation factors.

First, it should be determined whether the journal has objectives that are obviously international in scope. Second, is it attractive for authors and researchers from around the world to submit their papers to the journal? Third, how can publishers and societies differentiate the journal from other journals dealing with the same subject in Scopus? Fourth, it is necessary to evaluate international diversity among the editors and authors of the journal. Publishers and societies are asked two relevant questions—“What is the geographic distribution of authors publishing in this title?” and “What is the geographic distribution of editors of the title?”—and must choose among the following answers: “international: different continents,” “international: same continent,” “national: different institutes,” and “national: same institute” [7]. If international diversity among editors and authors is very limited, the publisher or society should identify the reasons for low diversity and develop strategies to achieve the desired ratio of international diversity by establishing working relationships with more editors and authors from different continents.

Editorial policies
Seventeen of the 106 titles (16.0%) were rejected after the CSAB review due to their editorial policies. These reasons for rejection include several specific factors, such as an unclear editorial concept/strategy, unconvincing journal policies, inadequate journal policies, and others. It is recommended that publishers and societies should review the status of their policies and identify whether their editorial policies are well-targeted and clearly stated.

First, publishers and societies should ensure that journals have consistent editorial concepts and strategies, which include aims and scope, editorial planning, content verification process, and the role of the editorial board. A clear editorial policy enables publishers and societies to contribute to the development of authors and to publish articles that are relevant to target authors and researchers. Second, journals
should have clear guidelines for authors, authorship, and publication ethics. In particular, publication ethics principles should be presented in a separate section to ensure that their importance is not misinterpreted. Finally, publishers and societies should provide all the relevant information to authors and researchers from all over the world on an English-language journal website.

**Conclusion**

This paper analyzed the reasons for which 106 Korean journals were rejected after the CSAB review and classified those reasons into six categories with detailed explanations. Based on the reasons for rejection, including the quality of articles, journals’ internationality, editorial policies, a limited number of articles for review, delayed publication, and too broad or narrow subject areas, it is recommended that publishers and societies should evaluate journals' performance with objective indicators and develop strategies to improve the quality of journals.

Furthermore, publishers and societies should learn about several factors that have a positive impact on the quality of articles and take steps to increase the visibility of articles to attract attention from authors and researchers across the world and to increase the opportunities for articles to be cited by other papers from a global perspective. Editors should expand editorial board membership to include international communities in order to increase the readership and the international appeal of their journals. On journal websites, authors should be able to identify clearly stated journal policies and relevant information, and publishers and societies should demonstrate journals’ value and eligibility to be indexed by Scopus. The results of this study are expected to provide publishers and societies with critical guidelines to increase the likelihood of being indexed by Scopus.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

**References**

Proposal for the development of a national open access database in Vietnam and comparison with other Asian countries’ national literature databases

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Abstract
In the context of the need to ensure appropriate signalling of the publication of high-quality, international-calibre publications in Vietnam, as well as new policies to improve the quality and effectiveness of scientific research in Vietnam, it is practical to investigate the possibility of developing a national open access database (NOAD). This study aims to answer the question of whether it is necessary to establish a NOAD in Vietnam. We used document analysis to evaluate issues related to NOADs. The results of this study show the complexity, lack of consistency, and difficulty in obtaining practical statistics and assessing research and scientific records in Vietnam today. Furthermore, the findings of this study imply that it is necessary to establish a NOAD of scientific research in Vietnam. The information in this report can be used to develop a NOAD for Vietnam in particular, and for any country that lacks one in general.

Keywords
Open access; National database; Vietnam

Introduction

Background: The question of open or closed access to scientific publications is still a subject of debate. Nonetheless, open access (OA) has become a growing trend; worldwide, in 2011, 11% of all journal articles were published in fully OA journals [1,2]. Scopus 2018 report stated that over 16% (3,600 of 21,950) of Scopus-indexed journals were fully OA [3]. This trend toward more
widespread OA represents significant progress towards the academic goal of improving fundamental knowledge, and it is the next step in transforming the online versions of journals [4]. The concept of OA also appears to align with the secondary goal of enhancing the influence of scientists and journals.

Vietnam lacks a national database system to archive, systemize and comprehensively evaluate science and technology research. Even without a national database available, it is possible to use several online databases, such as the National Open Database of the Ministry of Science and Technology [5], the National Library of Vietnam [6], and the Vietnam Citation Gateway (V-CitationGate; created at Vietnam National University, Hanoi) [7], although these are quite limited. Furthermore, efforts to develop a national scientific database have been fraught with inconsistent information and inefficiencies stemming from the existence of multiple other projects at the same time.

Purpose: The aim of this study is to propose the development of a national OA scientific database in Vietnam based on relevant research on this issue in other Asian-Pacific countries. Specifically, we reviewed the Directory of Open Access Journals (DOAJ) [8], Google Scholar [9], the national citation index system and the national OA database of scientific research in selected countries. Then, we reviewed the current status of Vietnam’s national OA database of scientific research. Finally, we proposed appropriate policy recommendations.

Methods

This research was largely based on the use of document analysis to evaluate issues related to OA databases. The selected materials were OA-related articles with keywords such as “OA,” “DOAJ,” “Google Scholar,” “science editing,” or “national database”; Vietnamese policy documents related to the evaluation of scientific journals, either OA or closed access (from Vietnam’s Ministry of Science and Technology and Ministry of Education and Training [MoET]); and information about policies related to the academic evaluation systems of some countries in the region. All OA-related information presented in this study is based on published descriptions or the official websites of the systems under analysis.

Results

OA in some Asian countries

The European Union [10] stated that “OA” refers to the free access of knowledge to all users, as well as the ability for authors and copyright holders to reserve the rights to allow all users to access, copy, recite, distribute, broadcast and display the research findings free of charge; to create and distribute derivative products in any digital means for any responsible purposes in accordance with copyright laws; and to create a limited number of copies for their personal use. This can be considered a broad definition of OA in research and publication.

According to the DOAJ, the 10 Asian countries ranking highest in the number of full-text OA journals are in Table 1 [8]. These results show the level of openness and participation of these countries in the DOAJ. Leading the list is Indonesia, and at the bottom of the list is Japan. To make appropriate recommendations for Vietnam, we examined the policies on OA databases or archive systems of several Asian-Pacific countries, including Indonesia, Thailand, Singapore, Malaysia, Laos, Cambodia, Myanmar, Brunei, Korea, Japan, and Australia.

Indonesia has the second-largest number of OA journals in the world. Despite the nation’s policies that encourage OA publication, it was not until 2018 that Indonesia set up the Indonesian Publication Index [11], initiated by the Indonesian Institute of Advanced Engineering and Sciences and later managed by Indonesia’s Ministry of Research and University Education. The Indonesian Publication Index was designed to approve, index, evaluate, supervise and improve the quality of academic publications in Indonesia.

Thailand unofficially introduced the Thai-Journal Citation Index (TCI) in 2001 (and officially established it in 2004) to evaluate the impact indicators of Thai journals following a proposal by Professor Narongrit Sombatsompop [12]. The main goals of the TCI are to motivate an improvement in the quality of Thai journals and to disseminate research findings for the benefit of the society and the community. The official website of the TCI is written in Thai, which clearly shows that its intended audience is Thai speakers. TCI-indexed journal articles are weighted 0.75, in comparison to a weight of 1.0 for Thomson-indexed international journal articles.

Singapore has not developed its own citation index. However, a Singaporean working team for the ASEAN Citation Gateway (V-CitationGate; created at Vietnam National University, Hanoi) [7], although these are quite limited. Furthermore, efforts to develop a national scientific database have been fraught with inconsistent information and inefficiencies stemming from the existence of multiple other projects at the same time.

Table 1. Top 10 countries in Asia, with regard to the number of full-text open access journals in the DOAJ, 2019 [8]

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>1,554</td>
</tr>
<tr>
<td>Iran</td>
<td>509</td>
</tr>
<tr>
<td>India</td>
<td>281</td>
</tr>
<tr>
<td>China</td>
<td>136</td>
</tr>
<tr>
<td>Korea</td>
<td>115</td>
</tr>
<tr>
<td>Malaysia</td>
<td>69</td>
</tr>
<tr>
<td>Pakistan</td>
<td>56</td>
</tr>
<tr>
<td>Iraq</td>
<td>41</td>
</tr>
<tr>
<td>Japan</td>
<td>33</td>
</tr>
<tr>
<td>Thailand</td>
<td>29</td>
</tr>
</tbody>
</table>

Index (ACI) was established in 2014 and led by Professor Michael Khor, with the aim of helping Singapore-based journals to join the ACI. The objectives of the working team are as follows: regarding journals which are not yet listed in Web of Science (WoS) and Scopus, to approach, support and sponsor them to join WoS and Scopus; regarding WoS and Scopus-indexed journals, to list them in the ACI. Hopefully, this will increase the chance that these journals are cited and give their researchers access to high-quality research findings.

Malaysia’s Ministry of Education established the Malaysian Citation Centre (MCC) in 2013 [13]. The MCC is responsible for contrasting, monitoring, coordinating and improving the quality of academic journals in Malaysia. The MCC maintains a citation index called the Malaysian Citation Index, or MyCite. MyCite provides access to indexes as well as full-text articles from scholarly journals published in Malaysia in the fields of science and technology, medical science, and social and human sciences. Additionally, MyCite offers citation reports and indexes of Malaysian authors, journals and organisations based only on the content of MyCite.

No plans have been announced for the development of the Laos Citation Index, the Cambodia Citation Index, the Myanmar Citation Index, or the Brunei Citation Index. However, the ACI has been active in these countries, with activities including organising conferences, assisting local journals in accessing the ACI’s information and creating standards that must be met to join the ACI.

In South Korea, the government officially encourages the development of full-text OA journals. In particular, it is legally mandated that the full text of government-sponsored social science or humanities research be published in an OA database, either in the South Korean citation index created by the government or in the WoS and Scopus indexes. The Korea Citation Index is a citation database of more than 2,000 Korean academic journals, covering all fields of science and technology, medicine, social and human sciences; this is similar to WoS and Scopus. Journal Article Tag Suite (JATS) 1.0 is an application that is widely used in South Korea to publish Korean-language journal articles in XML. This is relevant to Vietnam with regard to the development of an OA database in Vietnamese, the national language.

In accordance with international standards, Japan developed its own database, the Japan Science and Technology Information Aggregator, Electronic (J-STAGE). This platform is managed by the Japan Science and Technology Agency and has an interface in both Japanese and English [14]. Its objectives are to enhance the dissemination of information and to internationalise academic findings related to science and technology in Japan. This objective is highly relevant to Vietnam, as the dissemination of information and the internationalisation of academic findings related to science and technology would help scientists in Vietnam and beyond to assess the quality of their research papers and would improve the accessibility and ease of international citations.

The Australian Research Council (ARC) was established in 2001, with the mission of advising the Australian government in researching, monitoring, managing and sponsoring grants for the National Competitive Grants Program. It plays an essential role in investment in Australian research and development and is responsible for evaluating and selecting research

<table>
<thead>
<tr>
<th>Country</th>
<th>National open access database</th>
<th>Government-sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand</td>
<td>Yes</td>
<td>Yes <a href="https://www.tci-thaijo.org/">https://www.tci-thaijo.org/</a></td>
</tr>
<tr>
<td>Indonesia</td>
<td>Yes</td>
<td>Yes <a href="http://id.portalgaruda.org/">http://id.portalgaruda.org/</a></td>
</tr>
<tr>
<td>Malaysia</td>
<td>Yes</td>
<td>Yes <a href="http://mycc.my/">http://mycc.my/</a></td>
</tr>
<tr>
<td>Myanmar</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Laos</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Cambodia</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Philippines</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Singapore</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Vietnam</td>
<td>No</td>
<td>No -</td>
</tr>
<tr>
<td>Japan</td>
<td>Yes</td>
<td>Yes <a href="https://www.jstage.jst.go.jp/">https://www.jstage.jst.go.jp/</a></td>
</tr>
<tr>
<td>South Korea</td>
<td>Yes</td>
<td>Yes <a href="https://www.kci.go.kr/kciportal/main.kci">https://www.kci.go.kr/kciportal/main.kci</a>  <a href="http://www.nrf.re.kr/eng/index">http://www.nrf.re.kr/eng/index</a></td>
</tr>
</tbody>
</table>
for the Excellence in Research for Australia program. The ARC’s goals are to improve knowledge and innovate for the benefit of the Australian community through sponsoring the highest-quality research; to evaluate the quality and influence of the research; and to advise on research problems. The ARC is Australia’s leading consulting body on the national initiative to invest in research. The ARC also sponsors various organisations, individuals and areas of research for the benefit of the national economy, culture, community and environment. In 2017, the ARC established the ARC Open Access Policy (version 2017.1), which includes a key condition that research output must be made openly accessible [15]. The Australian Library and Information Association promotes the free flow of information and ideas through OA to recorded knowledge, information and creative works. The above analysis can be summarized in Table 2.

### Vietnam scientific database system

In Vietnam, no national database serves as the official reference for the two most prestigious national Scientific Evaluation Committees in the field of science and technology, namely the State Council for Professorship (SCP) [16] and the National Foundation for Science and Technology Development (NAFOSTED) [1,17].

The SCP is a prestigious committee composed of leading scientists from all fields and interdisciplinary specialties; these experts have the responsibility of considering and approving eligible candidates for professorships every year. They also advise the MoET on guidelines to further develop the cadre of professors, to improve the quality of doctoral training and to develop policies to grow the professoriate [16]. The publication-related criteria (journal articles and books used at the university level and above) of the SCP refer only to WoS and Scopus, and they mention the impact factor as well as the ranking (from Q1 to Q4) of a journal article without referring to the DOAJ or GS. More specifically, in the area of education (which includes four disciplines: General Education, Didactics of School Subjects, Educational Management, and Education of Specific Branches), the criteria used by the SCP for assessing the international journal articles published by candidates include (for WoS-indexed journals) the impact factor according to the Science Citation Index, the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts and Humanities Citation Index and (for Scopus-indexed journals) the ranking of the journal. The SCP of education additionally considers the reputation of other international journals in the field. No official criteria exist to evaluate the reputation of journals that do not belong to the above-mentioned indexes. The specific criteria are decided depending on the area and on experts’ evaluation of the specific articles and journals. The same situation applies to 27 other fields.

NAFOSTED has promoted research in Vietnam since its establishment in 2008 [1,18]. In order to register for research projects with NAFOSTED, authors are required to have WoS or Scopus-indexed publications. Moreover, NAFOSTED provides an annual list of prestigious journals and publishing houses as a guide for scientists. Accordingly, in addition to the core lists of WoS and Scopus, each disciplinary committee proposes a list for their own field (for example, the list for social and human sciences, issued annually since 2017). This list consists of reputed Vietnamese journals that scientists are encouraged (but not mandated) to publish in in order to receive NAFOSTED research grants.

The documents published by SCP and NAFOSTED clearly demonstrate the differences between the two evaluation systems (Table 3). Furthermore, it can be difficult to look up information about the domestic publications of candidate journals, which must be done manually, as there is no online database.

In 2016, the V-CitationGate was established at Hanoi National University of Education as a bibliographic database and a centre for the analysis of science, technology and innovations in Vietnam. Developed by the Vietnam National University, Hanoi, V-CitationGate consists of information (summary and/or full-text) regarding contemporary publications (journal articles and books), inventions, and in particular the rare and ancient materials that are collected, digitalised and integrated from various archive sources in Vietnam and overseas [7]. According to V-CitationGate, there are currently 66 OA academic journals, including 9 Vietnamese-owned journals that are internationally published.

### Table 3. Lists of prestigious journals and publishing houses recommended by SCP and NAFOSTED

<table>
<thead>
<tr>
<th>Committee</th>
<th>Scientific field</th>
<th>Prestigious international journals and publishing houses</th>
<th>Prestigious national journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCP</td>
<td>All</td>
<td>Annually revised list (WoS, Scopus, and an additional list of prestigious journals and publishing houses)</td>
<td>List of field-based journals with scores (SCP list 1)</td>
</tr>
<tr>
<td></td>
<td>Natural sciences</td>
<td>Annually revised list (WoS, Scopus, etc.)</td>
<td>Annually revised list</td>
</tr>
<tr>
<td></td>
<td>Social sciences</td>
<td>Annually revised list (WoS, Scopus, etc.)</td>
<td>Journals in SCP list 1 (maximum weight, 1)</td>
</tr>
</tbody>
</table>

SCP, State Council for Professorship; NAFOSTED, National Foundation for Science and Technology Development; WoS, Web of Science.
Another system under development is the Vietnam Citation Index (VCI), the official website of which falls under the MoET [19]. The VCI is stated to be under development by the National Professor Committee. However, as the information about this organisation is still “in the pilot period,” it is difficult to draw conclusions.

More recently, the research team of Quan-Hoang and Vuong proposed a database in the field of social sciences in Vietnam. The findings concerning the development and implementation of research based on the citations from this system have been noticeable in Vietnam.

Nonetheless, the abovementioned databases under development still lack adequate attention and investment. Moreover, no reference to these databases has been made in any documents of the two most prestigious scientific bodies in Vietnam, namely SCP and NAFOSTED.

Discussion

Based on the theoretical and empirical findings presented above, we propose the following recommendations for Vietnam. It is necessary to develop an official system of evaluation in the fields of science and technology, as was done in Australia, Japan, and South Korea. Currently, the evaluation systems in Vietnam belong to separate ministries (Ministry of Science and Technology and MoET), leading to an absence of impact on national science policies and a lack of consistency across different scientific fields and national-level research projects. The National Science and Technology Citation Index should be open—even fully open—access. We recommend developing the interface in both the national first language (Vietnamese) and English. This is advised based on research on countries that use English as a second or foreign language.

Developing a national database in Vietnam is highly feasible due (at least) to the three following reasons: first, most publications in Vietnam are written in Vietnamese and have considerable scientific significance; therefore, these publications need to be evaluated by Vietnamese specialists with the corresponding expertise. Secondly, the database would serve as a reference framework for scientists, journal editors and others in the field to gain a general picture of the national and international research situations. Thirdly, the categorization criteria used by the existing databases are inconsistent, raising the need for a set of criteria that are properly designated in the context of Vietnam and that satisfy international requirements.

It is essential to develop a Vietnamese OA database of science (VOADS). The first objective is to publish and disseminate academic research findings and scientific profiles of all authors. This system would provide an identification number for each Vietnamese scientist as a code for evaluation committees (such as SCP and NAFOSTED) to search, report and rapidly and automatically evaluate their scientific research competency. The system would also categorise and assess journals, publishing houses and state-owned authorities (institutes, universities, etc.). Accordingly, the government could introduce policies regarding the priority of investment in and the incentivization of science and technology research based on a precise digital database. The VCI would be part of this national database of science and technology. We recommend creating a timeline to develop VOADS in line with other international OA databases in terms of data structure and data information to facilitate integration and communication with worldwide databases.

Of course, certain disciplines of scientific research require special attention, such as politics, the military and national security.

Importantly, the foremost objectives of developing VOADS are to evaluate policies regarding science and technology development, to assess the fields of science and technology, and to help identify high-performing research teams and scientists. The task of developing academic journals only follows as a subsidiary mission, along with furthering science and technology in Vietnam.

A widespread trend for many countries in the Asia-Pacific region is to develop and publish research in their own national scientific databases. WoS and Scopus remain the most prestigious publication databases. Despite differences between databases in the levels of and requirements for openness, OA is an undeniably growing trend. The criteria and databases used for evaluation in each country also vary widely. This means the evaluation of the scientific quality of new databases is still in progress and takes a relatively long time. Both within a country and between countries, different approaches exist in employing and evaluating these databases. Nonetheless, there are two main objectives of the development of national databases: to evaluate, identify and invest in higher-value research teams and fields from the perspective of effective economic and social development; and to categorise and evaluate scientific fields, scientists, research organisations and journals.

It is important to create a detailed timeline for developing VOADS to ensure the following: first, all academic publications (journal articles, books, etc.) should be required to be OA. Second, the national database should be connected to other OA databases for further development and to satisfy international requirements. In the development of this national database, we recommend considering all of the current criteria used by international databases. Third, it is necessary to assist and encourage Vietnamese scientists to use and join OA databases, starting with VCI, Google Scholar and DOAJ,
based around the world in order to better approach the international community and to improve their reputation. Fourth, cooperating with accredited international publishing houses or journals may also help lead to the introduction of Vietnamese publication brands with international standards.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Current status of Indonesian journals in the field of Islamic economics and finance

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Abstract
This study aimed to explore the status of Indonesian journals in the discipline of Islamic economics and finance. In the last two decades, the emergence of Islamic economic journals was striking. As of November 2019, the Science and Technology Index (SINTA) contained 60 journals on Islamic economics, banking and finance, accounting, management and business, and philanthropy. To explore these journals, a content analysis was conducted using data in the SINTA database. Most of the Islamic economics and finance journals were in SINTA level 4 (out of 6). Only 8 journals were ranked in SINTA level 2, and none were in SINTA level 1. Based on these results, additional efforts are needed to improve journal quality. Moreover, many journals have not been indexed in SINTA, which might have good quality. The author suggests that further efforts be made to include Islamic economics and finance journals in other abstracting and indexing databases, such as the Directory of Open Access Journals, Moraref, and Garuda.

Keywords
Abstracting and indexing; Access to information; Indonesia; Periodicals as a topic; Bibliographic databases

Introduction
The emergence of the discipline of Islamic economics was accompanied by universities offering Islamic economics programs, and journal publications are needed to supply the market demands. In Indonesia, according to data retrieved from the database of higher education (Pangkalan Data Pendidikan Tinggi, https://pddikti.ristekdikti.go.id), there are nearly 900 departments of Islamic economics and finance in various degrees. In addition, there is a regulation that mandates the publication of articles by graduate students, lecturers, associate professors, and professors. These aspects of the academic environment have increased the need for qualified journals that focus on Islamic economics. However, an outstanding question is whether this high demand for journals has been accompanied by an increase in the number of high-
quality journals. For this reason, existing journals in this field must be assessed.

There are many ways to assess the quality of journals. Indexing is a common way to trace and identify the quality of a journal. Common indices used in the social sciences include Scopus, the Social Science Citation Index, and the Emerging Sources Citation Index [1]. According to a decision of the Ministry of Higher Education and Technology of Indonesia, journals indexed in these databases are categorized as highly reputable journals. In contrast, if a journal is indexed in the Directory of Open Access Journals (DOAJ), it is treated as a journal that meets the minimum requirements [2,3].

Some studies have assessed the quality of journals in the discipline of Islamic economics and finance globally. For example, Arshad [4] analyzed 25 journals in the field of Islamic economics and finance around the world, and found that concerns remained regarding credible journals and the lack of visibility. Nonetheless, some of the journals, such as the Journal of King Abdulaziz University, Islamic Economics, and the International Journal of Islamic and Middle Eastern Finance and Management were of sufficiently high quality to be indexed in Scopus. More recently, Shafiq [1] investigated 73 journals in the field of Islamic economics and finance, and found that only eight journals were listed in Scopus, Social Science Citation Index, or Emerging Sources Citation Index. Most of these journals were from Indonesia, but none of the Indonesian journals was indexed in Scopus.

Therefore, this study was conducted to analyze Indonesian journals in the discipline of Islamic economics and finance. A thorough knowledge of the current state of Indonesian journals in this field may serve as a trigger for authors, publishers, colleges or universities, and any other related parties to further enhance their respective roles to strengthen Islamic economics and finance journals.

The Science and Technology Index (SINTA) was introduced in 2016 by the Director-General of Strengthening Research and Development of the Ministry of Research Technology and Higher Education of the Republic of Indonesia, with the participation of professionals from various organizations [5]. The SINTA database can be accessed through the address http://sinta.ristekdikti.go.id, and its purpose is to evaluate lecturers, study programs, institutions, and journals, as well as to serve as an independent index in Indonesia. Indonesian journals are ranked from SINTA level 1 (highest) to 6 (lowest).

Methods

To explore and describe the quality of journals, a simple quantitative content analysis was performed in this study. Data on Islamic economics and finance journals were retrieved from http://sinta2.ristekdikti.go.id/journals. The first step in the search process was to find journals with keywords related to Islamic economics (Suppl. 1). The search was conducted in November 2019. Next, journals in the “economy” category were further searched. Data were collected on the year of publication, type of publication, language, and publication fee.

Results

Sixty journals were identified as Islamic economics and finance journals (Suppl. 2). The details of these journals can be found in Suppl. 2. Based on the data gathered, Islamic economics and finance journals only emerged within the last two decades. As shown in Fig. 1, the oldest journal was launched in 2004. Fig. 1 also shows that the number of these journals has increased rapidly, especially in the last 5 years. More than 30 journals were established by various institutions, and the period of 2015–2016 accounted for the highest number of new journals (12 and 10 journals, respectively).

The overwhelming majority of the journals (n = 57, 95%) published on a semi-annual basis, while two journals (3%) published on monthly basis, and one (2%) published three issues a year (Fig. 2). As shown in Fig. 3, the Indonesian Islamic economics and finance journals had four language policies: Indonesian only (27); English only (9); both Indonesian and English (23); and Indonesian, English, and Arabic (1).

In Indonesia, all journals are typically open access, which means that researchers can access and download articles published on the journal website. However, it does not mean that it is free for researchers to submit to and publish manuscripts in those journals. Some journals charge a submission fee, an article processing charge, or a fee for fast-track review. Of the 60 journals related to Islamic economics and finance, 51 (85%) were free of charge, while nine (15%) required article processing charges. These charges ranged from 100,000 (7.2 US dollars) to 1,000,000 Indonesian rupiah (72 US dollars).
Based on the data gathered from SINTA, there were 278 journals in the field of economics, and 60 of them were in the field of Islamic economics and finance. None of the Islamic economics and finance journals were in SINTA level 1, and none of these journals were indexed in highly reputable databases such as Web of Science and Scopus. The highest ranking was SINTA level 2, which included only eight (14%) journals. Most of the Islamic economics and finance journals (n = 31, 52%) were in SINTA level 4, followed by SINTA level 3 (n = 17, 28%). The remaining journals were in SINTA level 5 and 6, each of which contained two (3%) journals (Fig. 4).

However, according to the journal webpages, most of these journals had been indexed in Garuda (http://garuda.ristekdikti.go.id/journal), Moraref (https://moraref.kemenag.go.id/archives/journal), Crossref, Google Scholar, and DOAJ. Some of the journals were indexed in 15 or more indexes, such as Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah (Journal of Islamic Economics), Economica: Jurnal Ekonomi Islam, Iqtişad: Jurnal Ekonomi

### Conclusion

As shown in the above discussion, it is necessary to evaluate the research quality of Islamic economics and finance journals. For researchers, such an evaluation helps to determine where they should publish their articles, while for journal publishers, such findings provide valuable insights into how they can evaluate and improve the quality of their journals. The results showed none of the journals were in SINTA level 1, and only eight of the 60 identified journals were in SINTA level 2. Most of the journals were in SINTA level 4, followed by SINTA level 3, and relatively few journals were in SINTA level 5 and 6.

An inherent limitation of this study is that it only focused on journals indexed in SINTA. As a result, many journals were not included in this study, even if they were indexed in Crossref, DOAJ, Garuda, and Moraref. It could be the journals that have not been indexed at SINTA have better quality. Nonetheless, the results of this study indicate that additional efforts are needed to improve journal quality. The author suggests that further efforts be made to include Islamic economics and finance journals in other abstracting and indexing databases, such as DOAJ, Moraref, and Garuda.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.
Supplementary Material

Supplementary file is available from: https://doi.org/10.6087/kcse.191.

**Suppl. 1.** Keywords for Islamic economics and finance
**Suppl. 2.** List of Indonesian journals in the field of Islamic economics and finance indexed at Science and Technology Index

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Solutions for identification problems: a look at the Research Organization Registry

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Introduction

As DOIs and their associated metadata have been widely adopted in the research ecosystem to identify research outputs, there are still areas where identification of the full context or nature of these outputs is tricky, manual and therefore prone to mistakes. The first problem is one of identifying which organizations are affiliated with which research outputs. In other words, how can a research institution, like a university, easily see the publications and other outputs (such as data) that their researchers have produced? The second is identifying which grants resulted in which research outputs—how can a funder easily see the data, articles, preprints and more, connected to a specific project they funded? At the moment, reporting on both these areas is done manually, and relies on the researcher taking the time to let their institutions and funders know each time they publish an article. That time could be better spent doing research. There are also benefits for other stakeholders, including journals and publishers that having identifiers in place for organizations and grants will help accomplish.

Introducing the Research Organizations Registry

Crossref is one of the four founding organizations behind the Research Organization Registry (ROR), a community-led project to develop an open, sustainable, usable, and unique identifier for every research organization in the world. The other organizations in the project team are California Digital Library, DataCite, and Digital Science. There is also a wider steering group with representatives from the Coalition for Networked Information (CNI), Japan Science and Technology Agency, the Association of Research Libraries and the Academy of Science of South Africa. The registry launched in January 2019 and began assigning ROR IDs to more than 91,000 research organizations using seed data from Digital Science’s GRID database [1]. Since that time, the registry has expanded to cover over 97,000 entries. These can be found using the ROR registry search interface [2], or the ROR API [3].

Unique and persistent identifiers for the organizations affiliated with published research outputs minimize the amount of effort needed to disambiguate free-text affiliation fields or match outputs to affiliations. Adoption of ROR in scholarly infrastructure will enable more efficient discovery and tracking of publications across institutions and funding bodies, and will
support existing workflows. Since there is such a wide range of use cases for ROR, it was felt that a collaborative approach between a number of organizations (all with their own use cases) would best serve the community.

ROR in More Detail

The simplest way to show ROR is by looking at an entry in the ROR search interface (Fig. 1). In it, you will see the ROR ID for Yonsei University: https://ror.org/01wjejq96. The ROR ID is expressed as a URL that resolves to the organization’s record. It is a unique and opaque character string: leading 0 followed by 6 characters and a 2-digit checksum. The record also shows crosswalks with other identifiers for the organization: GRID, International Standard Name Identifier, Crossref Funder Registry, and Wikidata. Other information shown includes the organization name in Korean (ROR supports multiple languages and character sets), the website, the location, and its primary purpose. All ROR IDs and metadata are provided under the Creative Commons CC0 1.0 Universal Public Domain Dedication [4], so they can be widely disseminated and used.

If there are issues with the entry in ROR, then organizations can contact info@ror.org to request changes. Changes in ROR are currently implemented and passed to GRID, and GRID will also pass changes in GRID back to ROR.

ROR in Use

ROR focuses on the “affiliation use case”—identifying which

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**Fig. 1.** The record for Yonsei University in the ROR (Research Organization Registry) search interface (https://ror.org/search?query=yonsei+university).

**Fig. 2.** Author affiliation information in the current Crossref metadata schema.
organizations are associated with which research outputs. In this case, “affiliation” describes any formal relationship between a researcher and an organization associated with researchers, including but not limited to their employer, educator, funder, or scholarly society. In the case of journal publishing, editors will know that it can be difficult to clearly tell which institution an author comes from. Sometimes they will call the same institution different names, or an institution may change names or merge with another institution. As humans, we can look at the information and try to make an informed decision about the author or reviewer affiliation, but for the information to be available consistently, and at scale, the information needs to be readable in metadata too.

At Crossref, for example, information on the author’s institution is often missing from the article metadata. If the publisher does include it, they can only do so in a text string (Fig. 2). The information is clear, but entering the full text is open to error, both when the author inputs it and when the article is being prepared for publication. This also makes the information hard to report on or analyse at scale, because there can be so many variations in how an affiliation is entered. Crossref will start to accept ROR IDs in the metadata they collect later in 2020, with current proposals [5] suggesting ROR should be included as shown in Fig. 3.

Once Crossref starts to accept ROR IDs in publisher metadata, they will be disseminated via Crossref’s APIs and can be used by publishers to do analysis of where their authors are coming from, and by the institutions themselves to get a more comprehensive picture of what their researchers are publishing and where they are publishing it.

Some organizations have already integrated ROR IDs into their workflows. One example is Dryad, an international repository of research data. In Dryad, when an author starts to enter their affiliation (shown in Fig. 4), the lookup tool searches for a matching name in ROR and shows the author a drop-down list of possible matches to choose from. This will work regardless of whether the author starts entering a known abbreviation or the full name of the organization.

Dryad registers their DOIs with DataCite, and includes the ROR IDs with their DOI deposits so that they are searchable via DataCite’s search interfaces. The collection of this information by Dryad will ensure that research organizations will be able to find what data their researchers are making available via that repository. Other implementations of ROR are in progress which will help add ROR IDs in other research workflows, for example, Altum who run a system used by many funders to manage their grant information.

![Fig. 3. Suggested format for the collection of Research Organization Registry IDs in the Crossref Metadata Schema.](image)

![Fig. 4. Research Organization Registry integration in Dryad.](image)
Introducing Global Grant Identifiers

2019 saw the funder Wellcome register the first Grant IDs with Crossref. These persistent identifiers for research grants (rather than just the research funder) will help Wellcome and other funders easily find out what their researchers are publishing, where they are publishing and how - for example, many funders now require researchers to share their research data and to publish open access. Once Grant IDs are provided by the funder and passed into the publication metadata, the funder will then be able to search for a Grant ID and then see what has been associated with that grant. This will help them understand connections between projects and collaborators, mean less duplication of effort in overlapping grants or repeated projects and identify pockets of expertise and emerging areas of activity.

Grant IDs will help publishers generate more accurate funding acknowledgements, make sure that content is being published in line with funder policies, help reviewers spot potential conflicts of interest, and provide another mechanism for publisher content to be discovered and used.

How Grant IDs Are Implemented

Bilder and Hendricks [6] explains that a funder registering metadata and creating DOIs for grants would need to take the following steps: first, when a grant is submitted, the funder would assign their own internal identifier for tracking, e.g., 05-67-89. Most funders already use these internal numbers. Second, if the grant is accepted, the funder would 1) generate a global public identifier for the grant based on the DOI. For example, assuming their prefix was 10.4440, then the global public identifier could be https://doi.org/10.4440/00-00-05-67-89; 2) create a “landing page” to which the identifier will resolve. The landing page would display metadata describing the grant, as well as a link to the grant itself; and 3) register the generated DOI and metadata with their registration agency (e.g., Crossref or DataCite).

As with DOIs, if the metadata related to the grant changes, the funder would then update the information with Crossref. The funder would also promote the use of the DOI as the global identifier for the grant, and ask people to use it when referring or citing the grant. For example, authors would enter this information into submission systems in the field where they currently enter the award or grant number. The information would then be placed in the corresponding field in the Crossref metadata which is made available once the paper is published.

Crossref is working on this initiative with a wide group of funders including those from it’s Funder Advisory Group [7]. They have advised on the project from the start and will be among the first funders to register Grant IDs with Crossref. Once a critical mass of these identifiers and metadata are registered, they will start to populate through publishing workflows. Crossref is talking to various stakeholders including manuscript submission systems, hosting platforms, publishers and metadata users to make sure they are briefed on how they can integrate Grant IDs into their tools and services.

Conclusion

More stakeholders in the research process are getting involved in publishing workflows. They see an advantage in using these to try to fill in gaps in the map of the research landscape with new data points and better quality information to inform their policies and help them automate reporting to try to save their researchers time and effort. Persistent identifiers, such as ROR IDs and Grant IDs, if they are well-adopted and used, will help them with this. It is still relatively early in the lifespan of both initiatives, but they serve the broad needs of the research community and will expect their uptake to grow quickly in the next number of years.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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The rise of preprints and their value in social sciences and humanities

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Introduction

In this short essay, I describe the experience I have gained from my own ‘experiments,’ so to speak, on the actual value of non-peer-reviewed preprints in social sciences and humanities and whether they are beneficial for their authors. To present my ideas about the possible value of preprints as a means of (somewhat primitive) scientific publishing, the article will start with three cases, in which my preprints turned out to be useful and citable. Then, it proceeds to draw some short but worthwhile lessons for prospective authors.

The First Case: an Old Manuscript Deposited to a Frequently Cited Preprint Server

In one case, following the introduction of the preprint system at the Centre Emile Bernheim, Université Libre de Bruxelles, I sent an old unpublished manuscript to the administrator to post it online (https://difusion.ulb.ac.be/vufind/Record/ULB-DIPOT:oai:dipot.ulb.ac.be:2013/14581/TOC) [1]. I had no expectations whatsoever for its future use, except that people wishing to read it would have a place to find it. One reason for these modest expectations was the fact that the manuscript had been presented at an international conference and its abstract had been published in the conference proceeding.

To my surprise, the paper has since been read and cited by numerous researchers, in master’s and doctoral theses [2], journal articles [3], book chapters [4], and other working manuscripts [5].

At that time, preprint servers in social sciences and humanities were not widely used, except among economics research circles, where the SSRN and RePEc systems had been around for 10 years or so. It can be said that I stumbled on the opportunity to do this experiment to obtain some first-hand experience about preprints and their potential value.
The rise of preprints and their value

The Second Case: A Manuscript That Was Not Accepted by a Journal, But Was Deposited to a Frequently Cited Preprint Server

The next experiment occurred in 2014 when I submitted a manuscript to a German journal. Although the reviewers and editors appeared to have liked the manuscript, they did not seem to endorse the innovative approach and what they perceived as strange thinking that I presented in the manuscript and requested me to make too many changes. I faced a dilemma. If I had moved forward with publishing the paper, it would have contained a completely different set of ideas due to the removal of all innovative analyses and ‘subjective’ assessments. Alternatively, I could keep my ideas in the manuscript; however, the paper would then not be accepted because it would not fit the aims and scope of the journal. Thus, even though it was unfortunate that the German journal’s editors and reviewers did not move forward with the publication of my initial ideas, I stumbled on another opportunity to use a preprint server to disseminate my ideas and to stimulate discussion, this time with a clear expectation that it would be distributed, read, and possibly cited. I posted it to IDEAS/RePEc through the system of Université Libre de Bruxelles (working papers CEB, no. 14-010.RS; https://ideas.repec.org/p/sol/wpaper/2013-163371.html) [6].

Once again, the experiment did not fail at all. Over the past 5 years, this article has been used by dozens of authors, in many different research studies, including doctoral dissertations [7], master’s theses [8], journal articles [9], and book chapters [10]. By this time, preprint servers had become fairly well known, but editors and reviewers were still puzzled about their usage, and sometimes refused to consider a submission just because it had already appeared online as a non-peer-reviewed preprint. An example of this misunderstanding of the nature of preprints is furnished by the story of a postdoctoral researcher Alison Gerber, who also faced a similar problem because her paper was available on the preprint repository SocArXiv [11]. Another example is provided by the policy of a journal regarding preprints, according to which even though the journal does not strictly forbid preprints, the visibility of authors’ information might affect the double-blind review process and reviewers’ comments about the paper (the source did not disclose the name of the journal) [12].

The Third Case: A Manuscript Accepted by a Journal after Deposition to a Preprint Server

By the time of the third case, preprint servers had become widely known, with systems such as Open Science Framework, arXiv, and RePEc being used by hundreds of thousands of academics. Furthermore, our work was also a major one, with a lot of time and effort needed to complete the manuscript. As the senior author of the study, I decided to intentionally and voluntarily submit it to several preprint servers before submitting it to any journal. Why did I decide to take the risk? after all, there were still editorial boards that refused to consider preprints as submissions. Simply because I am an advocate for preprint server systems and open science. We posted it to multiple servers: Academia, OSF, SSRN, IDEAS/RePEc, arXiv, and PhilPapers [13].

Then, we proceeded to submit the manuscript to Palgrave Communications, published on the platform of Nature Publishing Group (NPG). I had a few concerns, as I believed NPG to be a publisher that pioneered numerous innovations in science publishing; therefore, the likelihood that they would consider an online preprint would be high. It turned out that my thinking was correct. NPG had no problem with preprints and even announced that they encourage not just preprints, but also preregistered reports [14]. Therefore, nothing unexpected occurred regarding the use of preprint servers. The real surprise is that although the manuscript was peer-reviewed in a relatively short period of time (roughly three and a half months), its preprint version still received the first citation by an official peer-reviewed article [15], well ahead of the formal publication [16].

Conclusion

There are different ways to look at the use and value of preprints, and debates continue on whether something belonging to the ‘grey literature’ like preprints should be formally recognized, or whether preprints would need some ‘light’ screening before being accepted to go live. For instance, Sheldon has warned that a bad preprint that attracts media attention might lead to confusion in society [17]. However, to maintain a healthy academic ecosystem [18], the following values have been suggested for preprint servers. First, if a research manuscript is not peer-reviewed, that does not necessarily mean that it is not useful or that it is uncitable. Second, sometimes, preprint alternatives can be valuable for preserving the original thinking of an author, which could be distorted when it becomes necessary to appease an unknowledgeable or rigid reviewer. Some authors may also use preprint servers to tell the world about their intention to preserve their free will [19]. Therefore, I suggest that preprints may be a valuable contribution as an open platform to share our raw ideas with a wider audience by allowing authors to share working papers, preprints, postprints, or published papers in an economical manner [20,21].
Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Engagement and integrity as the core of communication with examples from Samsung Electronics

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Introduction

In this article, I would like to discuss the core of communication. I believe that I was invited to discuss this topic because I worked in communication and risk management at Samsung Electronics Co., Ltd. from 2005 to 2017. Prior to that, I worked as a TV reporter for the MBC Broadcasting Company from 1982 to 2005 after my graduation from Seoul National University with a major in Asian history. Therefore, my main job can be described as a “communicator.” Although I worked in communications for 37 years, I still find it to be a difficult topic. I believe that I have found the reasons why communication is difficult. These days, we frequently talk about the importance of communication in all relationships: in politics, in a company like Samsung Electronics, at home, and among friends. Why do we frequently talk about communication? Because it makes us human.

What is a Human Being?

The Chinese word for human being is rénjìān [人間], which is composed of “man” (人) and “relationship” (間), suggesting that human beings are inherently grounded in relationships between people. Along similar lines, the Bible describes the first human being as follows: “God created the first human, Adam, and said: ‘It is not good for man to be alone. I will make a helper suitable for him’ (Genesis 2:18, New International Version).” This passage is often referred to as the beginning of the marriage system, but more fundamentally, it can be understood as evidence that human existence presupposes pluralism and relationships. It is the essence of human life that paired people live together in a relationship, within which communication is a message transmitted between partners. One difficulty of communication arises because humans do not send and receive messages honestly, as we can frequently see in daily life. Furthermore, communication often does not go well even when we do try to send and receive information honestly.
Examples of the Difficulty of Communication in Previous Literature

An excerpt from the Zhuangzi regarding the wheelwright P’ien

Duke Huan was in his hall reading a book. The wheelwright P’ien, who was in the yard below chiseling a wheel, laid down his mallet and chisel, stepped up into the hall, and said to Duke Huan, “This book Your Grace is reading, may I venture to ask whose words are in it” “The words of the sages,” said the duke. “Are the sages still alive?” “Dead long ago,” said the duke. “In that case, what you are reading there is nothing but the chaff and dregs of the men of old!” “Since when does a wheelwright have permission to comment on the books I read?” said Duke Huan. “If you have some explanation, well and good. If not, it’s your life!” Wheelwright P’ien said, “I look at it from the point of view of my own work. When I chisel a wheel, if the blows of the mallet are too gentle, the chisel slides and won’t take hold. But if they’re too hard, it bites in and won’t budge. Not too gentle, not too hard, you can get it in your hand and feel it in your mind. You can’t put it into words, and yet there’s a knack to it somehow. I can’t teach it to my son, and he can’t learn it from me. So I’ve gone along for seventy years and at my age I’m still chiseling wheels. When the men of old died, they took with them the things that couldn’t be handed down. So what you are reading there must be nothing but the chaff and dregs of the men of old” [1].

Confucius interpreted this phenomenon as follows: “The written characters are not the full exponent of speech, and speech is not the full expression of ideas; is it impossible then to discover the ideas of the sages?” [2]. This thought has been widely recognized since ancient times.

We believe that we see the things of the world as they are, but the experience of a single event can be described with quite different words. We believe that we see an event or an object as it is, objectively; however, in reality, we see it in our own way. A human sees in his or her own way, hears in his or her own way, and speaks in his or her own way.

Foreword of the History of the Peloponnesian War, written by the fifth-century BC historian Thucydides

“And with reference to the narrative of events, far from permitting myself to derive it from the first source that came to hand, I did not even trust my own impressions, but it rests partly on what I saw myself, partly on what others saw for me, the accuracy of the report being always tried by the most severe and detailed tests possible. My conclusions have cost me some labor from the want of coincidence between accounts of the same occurrences by different eye-witnesses, arising sometimes from imperfect memory, sometimes from undue partiality for one side or the other” [3].

To me, with my history major and journalistic background, the above quote from Thucydides is very impressive. The problem that historians lamented 2,500 years ago—the limits of human perception—is the same problem faced by journalists in the 21st century.

The Book of Genesis in the Bible

Why has the failure to communicate appropriately plagued us since the first humans?

And the LORD God commanded the man, “You are free to eat from any tree in the garden; but you must not eat from the tree of the knowledge of good and evil, for when you eat from it you will certainly die” (Genesis 2:16-17, New International Version).

The woman said to the serpent, “We may eat fruit from the trees in the garden, but God did say, ‘you must not eat fruit from the tree that is in the middle of the garden, and you must not touch it, or you will die’” (Genesis 3:2-3, New International Version).

What is the meaning of the above two passages? Theologians call the first case an instance of distortion of communication. According to the Bible, after this instance of distorted communication, humans ate the fruit of the tree of the knowledge of good and evil, against God’s instructions. If theologians are correct, the distortion of communication is the crime that caused the crime. Might one thus say that it is the number one crime?

Core Values in Communication

In the modern world, we frequently encounter distortions, limitations, biased judgment, and errors. I have thought sincerely about whether these may be essential aspects of human nature. Human existence is steeped in communication. In human relationships, we cannot persist without trust. Therefore, the core value in communication that enables human relationships is trust. The virtue for earning trust is honesty, a commitment that I will not view events in my own way, listen in my own way, or speak in my own way for my benefit. When talking with members of the communications team, I always said the following: “When any events happen to us, we should consider this: will our actions reflect well or poorly on the company?”

I believe that the social capital that is lacking in our society is trust. It is often said that Samsung is highly influential in our community, and that this influence is very burdensome. However, I believe that Samsung should serve as a good influence...
Three Examples of the Failure or Success of Communication with the Press and the Public at Samsung Electric

In 2007, employees of a security services company that was a subsidiary of Samsung Group donned masks and illegally invaded the villas under their charge. The company initially said that those persons resigned about a week before the incident and were no longer its employees. However, the media later reported that the police had confirmed that the burglars were still employees of the security services company. The newspaper published that the subsidiary company’s statements were false; therefore, the company had no choice but to admit to the lie. The public criticized the lies of Samsung’s subsidiary company. Due to the deterioration of its public reputation, the company apologized for this event; furthermore, its CEO resigned. In this way, the criminal behavior of a few security officers sparked credibility and integrity issues for the entire company. This incident was more a matter of losing trust in the company than a matter of the security officers’ criminal behavior.

The second incident was a hydrofluoric acid leak that occurred in January 2013 at a Samsung Electronics semiconductor factory. Unlike the previous case, this was an instance of unintentional communication failure. The first acid leak was reported at around 1 p.m. on Sunday, January 27, 2013. The hydrofluoric acid solution involved had a concentration of 50%, such that it would not evaporate unless the temperature was over 100°C. A worker at the factory was monitoring the leak; after 12 p.m., the magnitude of the leak increased, and the worker called an engineer to close the valve. The engineer decided to replace it. The valve replacement took place at 3:30 a.m.; after the replacement was completed, hydrofluoric acid vapor leaked out through tiny gaps in the valves. Then, an accident occurred. When the engineer went back to work, he neglected to wear proper work clothes and was transported to the hospital at around 8 a.m. due to gas poisoning. Compounding the problem, Samsung executives were unaware of this. Eventually, the engineer died. This incident was reported to the police and was made known to the public. No Samsung employee was at the site, and one of the subcontractors who worked there and four wounded engineers went to the police after leaving the hospital. As the President of Communication of Samsung Electronics, I was not immediately aware of the incident at that time.

Therefore, I felt that my only option was to say that I would explain the facts as soon as the cause of the accident and the details of the situation were identified. However, because the accident had happened one-day prior, the mass media quickly raised suspicions of concealment. This situation was embarrassing to me, but it reminded me of the importance of understanding the fundamental facts when communicating with the press.

My third example is the blackout at the Samsung Electronics Giheung semiconductor factory. In August 2007, an online media outlet released a report entitled “Black smoke from Samsung Electronics semiconductor Giheung factory power outage, fire suspected.” I was surprised to read this report because, while the description of an outage was correct, the part about the fire was not. At first, I told the press that the situation was a power outage, not a fire. A deputy general manager of the communications team told me, “All six lines of the K-2 semiconductor area have stopped functioning.” It was a critical accident. If all six lines were disrupted, how significant must the disruption in semiconductor production have been? If six lines ceased to function at the company that supplies 30% of the world’s memory semiconductors, the world’s semiconductor market would devolve into chaos. The general manager asked me, “What shall I do?” The question was how to respond to media inquiries. At that moment, I experienced an inner conflict. I always talked to employees about trust and honesty, and I also couldn’t hide or shrink from the press; it was evident that the impact would be too significant. Still, I hesitated to describe the accident precisely. When real situations arise, one can think of numerous excuses for why one should not follow the principles one has previously emphasized.

After some time, I told the general manager to report to the press that all six lines of the semiconductor factory were down due to a power outage. He was surprised and asked, “Can I?” I said, “You can cover it up for a few days, but it’ll later become known that the six lines were down at the time of the accident. If that happens, it will be revealed that Samsung tried to conceal the size of the accident, and the company will lose credibility in the market. So even if it means that the impact is bigger right now, we have to tell the truth.” I immediately went to the factory in Giheung and discussed the situation with the management team there. A factual report was dispatched to the communications team in Seoul and released to the media, who accepted Samsung’s explanation. The next morning, the power outage was resolved, and the semiconductor factory plant regained normal function. The press an-
nounced that Samsung had dealt with the situation with transparency, which increased the credibility of the company. Although it is somewhat painful and embarrassing to divulge personal examples such as these, they make it abundantly clear that the key is trust.

**Factors Determining Trust in a Company**

Edelman, a large American public relations firm and Samsung Group’s global public relationship agency, publishes an annual report called the Trust Barometer. The 2013 edition included a description of the factors involved in determining the level of trust in a company by members of the public. Immediately after the financial crisis in 2008, operational excellence was the most influential factor in building corporate trust, but its importance has been decreasing for the past five years.

In order of importance, engagement is the first factor in determining the trust held in a company. Engagement is a relationship; specifically, it involves listening to customers’ needs, treating employees well, prioritizing customers over profits, and communicating honestly and frequently about the business. The second is integrity: accurate and authentic behavior such as an ethical management style, responsible actions taken to correct issues or crises, and transparency and openness. The third is products and services for customers. Therefore, communication is the most essential key to the determination of public trust.

**Marketing and Non-market Strategies**

Companies look to the broader market with their marketing and non-market strategies. Market strategies refer to companies’ systems for dealing with competitors, customers, and suppliers. In addition to the market environment mentioned above, the market in which the company operates is surrounded by non-market environments, such as politics, society, and culture. The non-market environment is invisible in the market, but it consists of laws, regulations, and social sentiments that influence the achievement of business goals. In modern times, companies must be competitive not only in market strategy but also in non-market strategy. The communications team of a company must play a key role in non-market strategy, and I was at the forefront of these efforts at Samsung.

**Conclusion**

What is the role of the communications team in a company, and how does this role manifest? Various interests co-exist within a company, and as with any matter, there is always an issue of responsibility. Whatever the concern, there are bound to be some departments that do not want transparent communication. Such situations require the communications team to take on a leadership role. The communications team should be able to determine from an outside perspective what is needed for the company in a given situation and to persuade the internal departments involved. We must look at the issue from the outside and drag it to the inside. From this external perspective, we can see what to do, how to do it, and how the work should be prioritized. This is called risk management or crisis management.

I would go as far as to suggest that the communications team is the opposition party within a company. Through its role as opposition, the communications team should be at the core of risk management. I have also stressed that there is no shortcut to improve communications with the public or market; furthermore, there is no answer but to build trust in a way that starts with trivial matters.

And of course, if a significant accident happens just as we
are building trust, that trust may fall apart. Then, we have no choice but to build it up again.

**Conflict of Interest**

In Yong Rhee was the first President of Corporate Relations of Samsung Electronics Co., Ltd., from 2012 to 2017. He returned to this position on January 20, 2020. No other potential conflict of interest relevant to this article had been reported.

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Plan S

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Introduction

Recently, Plan S has been mentioned frequently in the news reports about journal publishing [1]. Those who are new to this may be puzzled by what it means. This plan, if implemented in earnest, will provoke a significant change worldwide in the field of journal publishing. Although it is being led by European funding agencies, it can have a big impact on researchers and journals around the world, including Korea. This article aims to provide an overview of what Plan S is and a brief description of the changes and problems that will arise when this plan is implemented.

Overview of Plan S

Plan S is an innovative open access publication initiative under the direction of Science Europe, an alliance of funding agencies and research institutes across Europe. The initial plan was announced in September 2018 by Coalition S, an organization involving several institutions in Science Europe and some external institutions. The essence of the plan is that all the results of the researches funded by the agencies participating in Coalition S should be published in open access journals or platforms with no embargo period or posted to open access repositories. According to the plan revised last year, it will be implemented starting from January 2021. Coalition S currently includes national funding agencies from various countries in Europe, including France, the Netherlands, the United Kingdom, Sweden, Norway, Finland, Austria, Poland, Ireland, Luxembourg, and Slovenia, and private organizations such as the Gates Foundation and the Wellcome Trust. Plan S is also supported by the European Commission and the European Research Council. Participation is expanding to other continents and a wide range of research projects are expected to be covered by the plan, especially since all studies to be funded by Horizon Europe, the European Union’s large-scale funding program, will be targeted.

Coalition S initially decided to develop a Plan S implementation plan based on the following ten principles: 1) Authors should retain copyright on their publications, which must be published under an open license; 2) Criteria should be established for the level and requirements of acceptable open access journals, platforms, and repositories; 3) If there is not yet a high level of open access journals, platforms, and repositories, appropriate support measures should be taken; 4) Publication fees should be covered by the funders or institutions, not individual researchers; 5) Publication fees should be transparent and have an upper limit; 6) Participating
agencies should endeavor to ensure that all relevant agencies affected by this plan have a consistent policy; 7) In the case of book publishing, a specific action plan should be prepared separately; 8) Hybrid open access journals are unacceptable, but if they commit to switch to full open access in the short term, they are conditionally and temporarily allowed; 9) Compliance with the plan should be always monitored; and 10) When reviewing research results, only the merits of the research are considered and factors such as journal reputation or impact factor are not considered.

When Plan S was initially announced in 2018, it received strong opposition, especially from commercial publishers. A revised version, which reflected some criticism, was released in May 2019. The initial plan was to put an upper limit on the author publication fee, but the revised plan removed the upper limit because of concerns that it could stimulate the publication of a large number of low-quality papers to compensate low publication fees. Some journals that operate on subscription fees have adopted a hybrid model in which authors can choose to publish their papers with open access if they pay a publication fee. In principle, these journals are not allowed by Plan S, but will be allowed on a temporary basis if they commit to transition to full open access journals by 2024.

If Plan S is implemented, researchers supported by Coalition S will not be able to submit papers to journals that operate on subscription fees. This will of course be a major blow to those journals, which include numerous journals published by commercial publishers and non-profit academic societies. If a paper is published in a subscription journal, but its version of record or author accepted manuscript is immediately deposited in a green repository upon publication, it is considered to be compliant with Plan S. However, if a journal does not allow immediate green and impose an embargo period, it is not acceptable for Plan S.

Open access journals and platforms where researchers are allowed to publish through Plan S must meet the following additional criteria: 1) They should have policies and practices that meet the criteria of the Committee on Publication Ethics; 2) They should be listed in the Directory of Open Access Journals; 3) Considerations such as exemptions or discounts of author fees should be given to the authors from low-income countries and the author publication fee should be made transparent on the journal homepage. In addition, they are required to have a high level of transparency and quality.

If Plan S is fully implemented and more funding agencies in more countries participate, many subscription-based journals will inevitably have to switch to open access. Those who disagree with Plan S point to the problems of poor-quality open access journals published for commercial purposes. Publishers of gold open access journals can increase their income simply by publishing more papers, so there is always the possibility of a moral hazard. The proponents of Plan S seem to believe that this issue can be controlled through a rigorous selection of acceptable journals. Without an upper limit on the author publication fee, it is likely that highly reputable journals will impose very high author publication fees. However, it seems to be believed that this can also be curbed through the control of research screening criteria. Some critics of Plan S point out the danger of breaking the tradition of subscription-based journals published by academic societies with a long history [2]. But this problem may be solved simply by allowing depositing in green open access repositories.

Conclusion

The background for the appearance of Plan S may be that there are many people who think the current journal publishing environment is not satisfactory and needs to be changed substantially. The recent trend in evaluating journals based only on the impact factor and the problems caused by the rapid growth and dominance of commercial publishers in journal publishing are also the source of serious complaints. Although open access publishing has its own problems, it looks inevitable that it will continue to expand.

Conflict of Interest

Kihong Kim is the editor-in-chief of Science Editing; however, he was not involved in the peer reviewer selection, evaluation, or decision process of this article. No other potential conflicts of interest relevant to this article were reported.

References


Tae-Sul Seo
Korea Institute of Science and Technology Information, Seoul, Korea

Date: August 7–12, 2019
Venue: Yitian Convention Center, Sheraton Changchun Jingyuetan Hotel, Changchun, China
Theme: Knowledge innovation · Knowledge service · Knowledge management
Organizers: Tongfang Knowledge Network Technology Co., Ltd. (Beijing); Jilin Tongfang Knowledge Network Technology Co., Ltd. (Beijing)

The Conference on Integrated Development of Digital Publishing and Digital Libraries (CDP-DL), which was held in Changchun, China from August 7 to 12, 2019, was hosted by several university libraries—including Tsinghua University Library—and supported by China’s leading academic information service enterprise, China National Knowledge Infrastructure (CNKI). As the largest international conference in the field of library science in China, CDP-DL held its 10th meeting in Changchun. Even though it was an international conference, the majority of the audience were Chinese, although some of the speakers were international. Regardless, the scale of the conference were enormous, as the hosts estimated that there were about 1,600 participants (Fig. 1). Recent trends in research publications and examples of digital library services were presented at this conference. First off, the morning of the grand opening was marked by greetings, welcoming speeches, and congratulatory speeches from important attendees, such as a member of the Jilin Province Provincial People’s Congress Standing Committee and the CEO of CNKI.

The first day was divided into four separate sessions, with nine presentations on the theme “Innovation development and knowledge innovation service industry” during session 1, six presentations on “Publishing transition for knowledge innovation service” during session 2, eight presentations on “Transition & development and knowledge service & knowledge management for libraries” during session 3, and five presentations on “Knowledge innovation service for different industries” during session 4.

A special presentation focused on various services offered to Chinese academic journals by CNKI. In China, CNKI Express is the service that most promptly delivers academic information worldwide through the operation of a new digital publishing model that includes online-first publication and data publication. In addition, various big data application services were...
presented.

To summarize what I realized by attending this conference, the field of scientific and medical journal publishing is developing beyond simple publication services to include information services and knowledge services, and users (as researchers) demand precise and personalized information, pursue data-based scientific discoveries, and distrust the existing commercial model of information services (Fig. 2). Although the CDPDL is a China-centered event for libraries and academic research organizations, it was worthwhile to attend considering the importance of the Chinese academic journal publishing market, both now and in the future. Special attention should be paid to the journal publication-related policies and services of CNKI, which supported this event.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.
Report on the Crossref LIVE19 annual meeting

Jae Hwa Chang
Infolumi, Seongnam, Korea

Date: November 13–14, 2019
Venue: Tobacco Theater, Amsterdam, the Netherlands
Theme: Have your say
Organizer: Crossref
URL: https://www.crossref.org/crossref-live-annual/

Crossref’s 2019 annual meeting was held in Amsterdam, the Netherlands, on November 13 and 14. At this meeting, Crossref celebrated its 20th anniversary and took the opportunity to look back on the last 20 years and to explore, together with the participants, the directions that Crossref should take in the rapidly changing environment of scholarly research and communications (Fig. 1).

The first day of the event began with a glimpse of Crossref’s history from its inception to today, presented by Ed Pentz, Crossref’s Executive Director. This was followed by a presentation entitled “Perceived value of Crossref” by Ginny Hendricks, Director of Member and Community Outreach. She explored perceptions of Crossref, its mission, and its services through telephone interviews and surveys. Based on the results, she presented Crossref’s value in the field of scholarly communications as an infrastructure organization, metadata distributor, open scholarship supporter, and community hub. Next was Ed Pentz’s presentation on “Strategic scene-setting.” He briefly addressed the following issues: the evolution of Similarity Check services, adding preprint as a content type, membership growth by fee tier by year, the distribution of revenues (comparing 2011 to 2019), total registered content distribution by annual membership fee tier, average time spent by constituency, and income and expense history during 2010–2019.

The next session was composed of “In their own words” talks, for which members were divided into five groups: large publishers, medium publishers, small publishers, research funders, and academic groups. Representatives of each group talked about Crossref’s role and their desires for Crossref’s future vision. One of the most impressive talks was “Crossref’s value in an era of open science,” presented by Todd Toler of Wiley. He defined Crossref’s value in four ways: first, Crossref is in a unique position to solve major problems in the field of research communications; second, publishers are in greater need of cooperation, shared infrastructure, and standards than ever before; third, Crossref’s revenue growth is driven by content deposition fees, but its ambitions are increasingly driven by the goal of providing infrastructure be-
Table 1. Ordered table of opinions on Crossref’s priorities from 11 discussion groups

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Data provided by Crossref.
ROR, Research Organization Registry; JATS, Journal Article Tag Suite; DUL, distributed usage logging; EPEC, Emerging Publisher Education Coalition; COPE, Committee on Publication Ethics; DOAJ, Directory of Open Access Journals; INASP, International Network for the Availability of Scientific Publications.
yond its core linking service; and fourth, the sustainability of Crossref’s future growth depends on aligning its roadmap with its funding sources.

Another interesting talk was “Researcher and metadata user view” by Ludo Waltman from the University of Leiden, who represented the perspective of academic researchers. He introduced some examples of how Crossref’s data are used in academic fields and drew sympathy from many participants by presenting the following recommendations: first, it is necessary to ensure that basic infrastructure works well; second, Crossref should work together with publishers to increase the completeness of metadata (abstracts, affiliations, license data, etc.) and participate in initiatives to improve and enrich metadata; and third, fair models should be developed for funding and sustaining such initiatives.

On day 2, a roundtable discussion continued throughout the day. The participants were divided into 11 discussion groups of about 10 people each. They discussed topics based on an examination of the 2018–2019 annual report, entitled “Fact File” [1]. After an exchange of viewpoints, the facilitator of each group presented the results of the discussion. In more detail, the process was as follows. First, given the discussion topic, each participant wrote three critical points on each of three sticky notes. Then, the participant summarized the three items aloud, one by one, and placed each sticky note in the middle of the table. If the same opinion was shared by other group members, multiple sticky notes were all placed together. Sticky notes representing the same view were stacked in the middle of the table, and the number of the same opinions was counted. The opinion with the highest number of sticky notes was identified as the representative opinion of the discussion group. That opinion was presented to all participants. Each group created a presentation in a Google slide. The session organizer shared the updated files in real time with all participants. There was no single correct answer in the discussion, but it provided an opportunity to hear what the other participants thought and to share thoughts.

The discussion consisted of three topics. The first was “What is our mission and who do we serve?” The 11 groups articulated several different opinions in response to this question. Fig. 2 presents the opinions of my group. The opinions on “What is our mission” were as follows: 1) a critical function is missing; 2) it is better to describe the mission as “effective and efficient” than as “new and innovative technologies”; and 3) the definition of “community” was not clear. The opinions on “Who do we serve” were as follows: 1) the expansion of board representation in response to changes in scholarly communications is positive; 2) in the future, more diverse board configurations should consider personal characteristics, organizations, age, gender, the global north/south, and specific aspects of candidate board members; 3) metadata consumers are missing from committees; and 4) too much staff time is dedicated to large publishers.

The theme of the second session was, “How are we sustained?” First, for the question, “Does anything surprise you about Crossref’s revenue streams?”, the members of my group identified the following factors: 1) the Similarity Check change in 2020; 2) the jump in revenue from the $275 category, which accounted for the highest proportion of total revenue in 2019; and 3) the 10-to-1 imbalance in the relationship between content registration and metadata users. Next, the answers to the question, “If there was one thing you could change about Crossref’s revenue streams, what would it be?” were as follows: 1) more revenue should be requested from metadata users (not for data, but for services); and 2) a more in-depth analysis of the $275 category is needed.

The topic of the third session was how to find a balance between members and the community, as reflected by the question “How should our priorities change?” We discussed what to consider first out of four categories: “Simplify and enrich existing services,” “Improve our metadata,” “Adapt to expanding constituencies,” and “Collaborate and partner.” The opinions gathered in my group are presented in Fig. 2. The opinions of the 11 groups are summarized in Table 1. The interest in the ROR (Research Organization Registry) was the highest, followed by the need for metadata principles and best practices and the rapid growth of membership in countries where English is not spoken as the first language.

The group discussion process, which was dynamic and involved the use of exciting tools, promoted active participation by all attendees. This annual meeting was an opportunity for participants of various backgrounds—with different membership types and affiliations, and from different countries—to experience multiple aspects of Crossref and to deepen their understanding of Crossref. Based on the invaluable opinions of the participants, I look forward to the ongoing development of Crossref, which has served as crucial infrastructure for sharing, preserving, and evaluating research information.

Conflict of Interest

Jae Hwa Chang is the Crossref Ambassador in Korea; otherwise, no potential conflict of interest relevant to this article was reported.

Reference


http://www.escienceediting.org
Report on the 2019 Workshop for Korea Manuscript Editors Certification Holders

Se Jueng Kim
MEDrang, Seoul, Korea

Date: July 12–13, 2019
Venue: Hyundai Bloomvista, Yangpyeong, Korea
Organizer: Korean Council of Science Editors

Three full years have already passed since I obtained a Korea Manuscript Editors Certification (KMEC), during which time I have never missed a single workshop for certification holders. At the two previous workshops, the issue of the most interest for journal editors from the past year was selected as the discussion topic, along with a separate dedicated time for sharing tips useful for the hands-on tasks of manuscript editor (ME). Initially, when looking forward to the topics that would be covered at this year’s workshop of the Korean Council of Science Editors (KCSE), I expected that predatory journals or data sharing would again be the focus of attention. However, contrary to my expectations, this workshop primarily focused on practical aspects of business and provided valuable assistance regarding the challenges and questions that KMEC holders face in their day-to-day responsibilities. In this report, I will look back on my participation in the third workshop for KMEC holders held in Yangpyeong, Gyeonggi Province in July 2019, with the hope of conveying how beneficial the workshop was for various association members and publishing staff preparing to acquire a KMEC, as well as for KMEC holders who had not previously attended a KMEC workshop.

The Hyundai Bloomvista in Yangpyeong provided a venue for the workshop for KMEC holders from July 12 to 13, 2019. The workshop had changed quite a bit, both in terms of the venue and the topics, duration, and modalities of the lectures. On July 12, the first presentation started at 10 a.m., which was a little earlier than at the KMEC workshops held in earlier years. The presentation dealt with the definitions of supplements and appendices, as well as methods of processing and storing supplementary data when provided. In the past, many journals have suggested that authors avoid including supplements and appendices if possible, but as technology has advanced and the importance of data-sharing has become more widely recognized, it has become more common to attach extensive supplementary data when submitting manuscripts. MEs carrying out hands-on tasks have expressed concerns about processing these supplements. I learned that it is the role of the ME in such situations to assist the editorial board in establishing the journal’s policies for handling these issues, and to ensure the consistency of all supplemental data processing methods. Above all, the presentation was easy to comprehend...
because it used examples to show how supplementary data are handled by various journals.

The next lecture was on pre-prints (Fig. 1). To be honest, it was hard to understand the benefit of making materials available on public servers before they are submitted to journals or undergo peer review. One of my concerns would be that another researcher might write a paper based on wrong information if journals were to make manuscripts with critical errors available without screening, resulting in a scenario in which errors keep leading to errors. Nonetheless, pre-prints are expected to become increasingly common, given the fact that from another point of view, this rapid disclosure has advantages in terms of improving the feasibility of citations and allowing researchers to make claims on the ideas underlying the research. It seems that authors should make prudent decisions on pre-prints according to the prevailing standards in their field and the topic of their research.

After wrapping up the morning lectures, ginseng chicken soup (samgyetang) prepared for Chobok by the hotel was served for lunch, and the workshop resumed with the introduction of software useful for ME tasks and a brief demonstration.

As the scope of references is becoming more diverse, it is becoming more difficult to search for references, making it very time-consuming to proofread manuscripts. For this reason, my jaw dropped throughout this presentation. I was astonished to see a demonstration of a program that did not just automatically search for references, but was able to proofread them according to the journal’s style—even though a final inspection by a human was naturally required to feel absolutely confident in the results. In addition, the workshop went on to introduce programs capable of correcting simple grammar and spelling errors when proofreading an English manuscript. Just as it is difficult to find Koreans who have perfect grammar and spelling in Korean, quite a lot of grammar, spelling, and punctuation errors are found in papers written by English-speaking authors. PerfectIt (Intelligent Editing Ltd., https://intelligentediting.com) and Grammarly (Grammarly Inc., https://www.grammarly.com) were presented as programs utilized in the revision of all manuscripts submitted in English, and the display of actual correction marks and how these programs could be applied within a manuscript was very helpful for understanding their function. It is expected that making good use of such programs when proofreading manuscripts will provide benefits in terms of both accuracy and speed. The programs that were presented in this session are currently proving to be useful for hands-on tasks, and anyone who feels out-of-date on new technologies (such as the present author) should feel free to obtain high-level information by participating in the next workshop.

The education session came to a close with a group exercise. Each group selected one academic journal and evaluated it according to the listing criteria for specific databases (Directory of Open Access Journals, Korean Federation of Science and Technology Societies, and Scopus) in order to determine the likelihood that the journal would be listed, and then practiced writing actual applications. Since the groups were assigned and participants were notified of their assignment by e-mail before the workshop, we chose the Journal of Obesity & Metabolic Syndrome (JOMES) as the practice journal after a discussion among the group members in advance. At the workshop, the group members jointly reviewed whether the journal’s homepage included all the corresponding information for every listing criterion, and the task was completed quickly due to the participation of MEs who worked for the selected practice journal, JOMES. In fact, JOMES is preparing to apply to be listed in Scopus this year. As a journal that meets all the criteria and has gained experience from submitting a previous application, there is no doubt that good results await.

The formal education program planned for the workshop concluded with presentations of each group’s assessment. Although it is tempting to elaborate on the delightful dinner and debate that lasted until 11 p.m., as they were memorable events that should not be left out, I will instead try to avert the potential concern that it might sound like there were no opportunities to rest between the education and training sessions. In fact, sufficient breaks and nutritious meals were provided, along with time for the participants to become more closely acquainted with one another. Therefore, I urge any KMEC holders who might be hesitating to attend to put aside
their worries and participate in this workshop.

Workshops for certificate holders are evolving every year. Although these workshops provide a venue for the participants to seek assistance, the KCSE staff who prepare the workshop always make the utmost effort to notice and meet participants’ needs. It is definitely not an easy job to share their exclusive information related to hands-on tasks and to prepare for the presentations in addition to their regular work responsibilities, especially in a world where information is power and time is money. I would like to express my gratitude to the KCSE staff for taking their precious time to hold the workshop and would also like to gently express my heartfelt anticipation for the pleasant surprises that await in terms of the content that will be presented at next year’s workshop.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.
Search engines and software for manuscript editing

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Abstract
In recent years, manuscript editing has become extremely important for academic journals. Using appropriate software for manuscript editing results in improved work efficiency and increased accuracy; therefore, this article aimed to introduce search engines and software that can be used for manuscript editing. First, a variety of search engines and academic databases can be used to reduce errors and to create accurate references. Google, the world’s leading search engine, provides users with information with the highest probability of accuracy, regardless of the reference language or the search term. If it is not possible to find certain information on Google, one can consult WorldCat, PubMed, Naver Academic, KoreaScience, Research Information Sharing Service, DBpia, Crossref, and Edifix. In particular, Naver Academic provides search results for some materials that cannot be found on Google. Second, PerfectIt facilitates the correction of errors that occur frequently in English-language documents. Finally, Grammarly is a helpful tool for checking and correcting grammar and spelling errors. As the academic publishing environment changes, the role and demands of manuscript editors are also changing. In a fast-paced environment, the software and search engines discussed herein are highly useful tools for manuscript editing.

Keywords
Language; PubMed; Publishing; Search engine; Software

Introduction

Many academic journals have their manuscripts edited by a manuscript editor (also known as a copy editor, technical editor, or managing editor) [1]. A manuscript editor is a person who edits manuscripts submitted by researchers for clarity, precision, readability, technical compliance, and structural accuracy [2]. In addition, a manuscript editor rewrites and revises the text, graphs, tables, and references according to the journal’s publication guidelines. In recent years, it has become necessary to consider several new aspects of academic publications, such as authors’ contributions and ORCID IDs, which have increased manuscript editors’ workload.
Using appropriate software for these tasks can reduce the overall time required, while improving accuracy. Verifying the references section is the most time-consuming task, and the use of appropriate software can greatly increase the efficiency of this process. In this article, we review websites that can be helpful for finding references, and consider additional software that can be useful for manuscript editing.

**How to Verify References**

Ideally, the author of a manuscript should ensure the consistency of all the included references; however, in reality, inaccurate references are often included in accepted submissions. References that do not undergo verification may include a variety of errors. For example, when a reference is modified to meet the formatting guidelines of the target journal, some of the information may be omitted or misspelled. In some cases, incorrect information may be reproduced when inaccurately written references are copied and pasted from other papers.

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<th>Table 1. Essential characteristics of software used to search for references</th>
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<th>Table 2. Software that can help with manuscript editing tasks</th>
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<sup>a</sup>Resources that are not included in Google search results need to be searched separately; <sup>b</sup>The first page of the article’s PDF is provided free of charge, and paid members can access the full PDF; <sup>c</sup>Basic features are free, but they have paid premium functions.
without examining the original article. Therefore, manuscript editors should carefully check the reference information, with the assumption that the references could contain errors.

Usually, manuscript editors use search engines and academic databases to validate references. The critical characteristics of these search sites are listed in Table 1. However, no single resource is completely satisfactory, and if one has a thorough understanding of the characteristics of each website and can use them efficiently, it is possible to work more quickly when verifying references.

The basic process of verifying references is to obtain the original PDF file and to check the information provided by the author through a direct comparison. In some cases, however, a website might not exist for a certain journal, and in other cases, articles cannot be directly downloaded because they are not free. In such cases, the consistency of references needs to be verified using information from various academic databases and other sources.

If the information that must be verified is registered on a journal’s website or in a database, verification can be easily accomplished. However, if the information cannot be found, there are two primary possibilities: either it is wrong, or it might not be available online. Outdated reports or books, as well as those that do not have an official English title but are translated into English in the references section, are hard to find online. In such cases, it might be helpful to search for a certain term contained within the reference, rather than typing in the full details of the title, author, and year. If searching for a journal article by title or author seems difficult, another possible technique is to check the volume, issue, and pages directly after navigating to the archive on the journal’s website.

If a reference cannot be found at all, it is best to ask the author for confirmation. In some cases, if the author did not directly check the original article, he or she may ask for the reference to be deleted. Moreover, in some cases, the author may find a reference and send it directly. If part of a reference is missing, it is necessary to include the missing part after checking with the author to confirm the exact part of the reference to be included.

The software presented in Table 2 is freely available or provides a free trial. All the information is based on data gathered in October 2019, and the features and prices of these tools are likely to change with time.

Google
Google is the most popular search engine globally. Irrespective of the language of the reference or the information used for searching, Google provides the most accurate reference information. Most of the websites mentioned in the later sections of the article are also included in Google’s search results; therefore, Google is the most preferable search engine for all references. Users can usually find most of the information they need by clicking on the top two or three Google search results. Google is capable of providing search results that are more accurate than the search function provided by various databases.

Google uses a web crawler called “Googlebot” to find and classify data by independently surfing the web. The policies of some sites prevent this form of web crawling, and some sites are not optimized for crawling by bots; the information contained on such sites is therefore not available on Google. If certain information cannot be found on Google, then the other websites listed in Table 2 can be used.

**Google Scholar**
Google Scholar is the world’s largest site for freely accessing scholarly information. Unlike Google, Google Scholar offers features optimized for scholarly literature. When Google Scholar identifies a document based on the content of the journal’s source site, PubMed, and various databases, it collects the data and outputs it as a single result. When it is difficult to identify accurate bibliographic information in one place, additional content might be found on other sites. References can be displayed using the Modern Language Association (MLA) and American Psychological Association (APA) styles and can also be downloaded as RIS and BibTeX files, which can help find additional information.

Even if Google Scholar is unable to find a source site, it generates bibliographic information if many articles cite a specific article (Fig. 1). For example, even if an article that was published in 1940 does not have its original text on the Internet, the information of the cited article is analyzed and provided as an output. This may be valuable information about hard-to-find data, but in some cases, non-existent literature can be generated as if it were real. A search result that is not directly linked to the original data can be used to check whether the information that the author gave is accurate by comparing the result from Google Scholar with the information provided by the author. In short, the basic principle is to find the original source and then to write an appropriate reference on that basis.

![Google Scholar results without a reference link to the original site.](https://www.escienceediting.org)
Google Books

Google Books is a service where users can browse and search the full text of books provided by publishers. Some books offer the full text with the publisher’s permission, while others have partially-released contents. To make a reference to a book, the publisher’s name, city, and year of publication are required. If a chapter is cited, the chapter name and author are also required. In such cases, one cannot create a correct reference without directly checking the front matter, which includes the copyright and table of contents. Google Books allows users to see the cover, copyright, and table of contents of a book, which enables manuscript editors to check the original source and to correct references as needed. When users search for a book on Google, they often find results for online bookstores—such as Amazon and Kyobol Books, which is mainly used in Korea—and publishers’ homepages—such as Elsevier, Springer, and Wiley—in addition to Google Books. Some of these sites also offer free front matter for certain books, which manuscript editors can use to verify references.

WorldCat

WorldCat provides data for over 2 billion books from 10,000 libraries worldwide [3]. If Google fails to retrieve the information needed for a book, it is recommended to search WorldCat for the book’s name, year, and other information. WorldCat aims to provide more accurate information about books than Google, and it does contain more information about books than Google.

A noteworthy feature about WorldCat is that it provides both the publisher’s name and location. However, since the books’ front matter is not provided, it is difficult to identify chapter titles and authors. Further, as WorldCat does not store information on all the editions published in various regions, book information that is not verifiable in WorldCat should not automatically be considered to be inaccurate. However, WorldCat is still useful for finding missing information and checking erroneous parts of references.

PubMed

PubMed is a biomedical abstract database maintained by the US National Library of Medicine. It verifies all the data carefully before abstracts are uploaded to the database, so the accuracy and reliability of the data are quite high compared to other sites. All information, including changed journal names, errata, volume and issue numbers, page numbers, and DOIs, is well maintained. As PubMed consistently provides reliable information, if Google determines that PubMed has relevant data, it ranks PubMed higher than the original site. Authors’ names and journal abbreviations are accurately maintained, which makes it easier to distinguish between first and last names and to quickly identify journal abbreviations.

Naver Academic

Naver Academic is an academic database created by Naver, which directly contracts with several globally renowned publishing organizations, such as Crossref, PubMed, British Library, and the IEEE [4]. As of January 2019, it stores more than 200 million articles, and some resources that cannot be found on Google can be found by searching here.

KoreaScience

KoreaScience is a free full-text database provided by the Korea Institute of Science and Technology Information (KISTI) that is used as a DOI landing page by many journals in Korea. Original PDFs are freely available for all the articles that it contains. However, it can be a problem if a journal’s name has been altered or modified, because the journal’s name would then be changed retroactively. Therefore, although it is cumbersome to do so, it is important to check the original PDF for accurate information when verifying a reference.

Research Information Sharing Service

The Research Information Sharing Service (RISS) is an academic database provided by Korea Education & Research Information Service that allows researchers to search academic resources produced and possessed by Korean universities [5]. In particular, the RISS has numerous Korean master’s and doctoral dissertations that are difficult to find in other databases.

DBpia

DBpia is a commercial database provided by Nurimedia for articles produced in Korea. The first page of the article’s PDF is provided free of charge, and paid members can access the full PDF. As most articles provide the information needed for a reference on the first page of the PDF, this resource can be quite helpful when checking the references for Korean papers. Basic bibliographic information and export citation functions are provided based on the information written in Korean. As most Korean journals have references written in English, it is recommended to check the PDF directly to ensure the accuracy of the English-language wording. As a point of comparison, other Korean commercial academic databases (such as Koreanstudies Information Service System [KISS], e-article, and Korea Scholar) do not provide a free PDF preview function.

Crossref Link References

Crossref Link References is a DOI search service provided by Crossref. Although it allows several DOIs to be obtained quickly, errors in a reference cannot be identified based on these search results. However, searching for the DOI allows users to directly access the original site to find the necessary
information and edit the reference accordingly. If a DOI is assigned to an article, most of the references will be searched. However, if a DOI is not available, such as for books or reports, other search methods need to be used.

**Crossref Simple Text Query**
Crossref Simple Text Query is similar to Crossref Link References, as it is a resource for DOIs to be searched and printed. By selecting the ‘Include PubMed IDs in results’ option, search results for DOI, PubMed ID, and PubMed Central ID will be obtained. If most of the references are for journals that have DOIs, they can be quickly accessed using their DOIs.

**Edifix**
Edifix is a paid reference proofing website, launched by Inera, which developed the eXtyles program that helps to edit JATS XML in Microsoft Word [6]. Edifix finds, modifies, and provides notifications for the incorrect parts of reference lists using data registered in PubMed, Crossref, and other sources. For biomedical journals, which contain references to articles listed in PubMed, Edifix corrects references with a very high rate of accuracy (Fig. 2). The reference output style uses pre-designed, well-known styles (e.g., Vancouver, American Medical Association [AMA], and APA style), which the users cannot easily customize—to do so, they would need to contact Edifix directly. In addition, it is difficult to compare references for non-journal references, such as books and reports. However, even in such cases, the order of components within the reference is corrected to follow the selected output style. Edifix charges per reference, with rates ranging from 0.09 to 0.16 US dollars depending on the payment plan. Initially, it offers a free trial for 100 cases.

**Helpful Software for Manuscript Editing**

**PerfectIt**
PerfectIt is a Microsoft Office Word add-in program that helps to fix common errors in English-language documents [7]. This program can be used for all documents produced in English, not just journal articles. The following tasks can be completed with a few clicks, similar to the Word ‘find and replace’ process (Fig. 3): 1) identifying abbreviations that have not been defined (or that appear before their definition); 2) ensuring hyphenation consistency (e.g., ‘fine tuning’ vs. ‘fine-tuning’); 3) checking capitalization consistency (e.g., ‘Government’ vs. ‘government’); and 4) ensuring consistency of italics (for foreign words such as ‘in vivo’ vs. ‘in vivo’). It is offered as a 14-day free trial and charges 70 US dollars per year per user.

**Grammarly**
Grammarly is a program that finds and corrects errors in English grammar and spelling [8]. It is available for all platforms, including Chrome, Word, Gmail, and Outlook. It suggests corrections by checking for incorrectly spelled words, tense mismatches, inappropriate use of articles, and singular/plural mismatches (Fig. 4). By default, all these features are
available free of charge, with a premium version of 29.95 US dollars per month. The premium version provides additional features, such as readability, vocabulary enhancement suggestions, and genre-specific writing style checks.

Conclusion

Manuscript editing involves thoroughly improving the quality of an article. The scope of work varies, and the best approaches to produce optimal results may also vary depending on the academic field, academic journal, and the editor’s preferences. Therefore, it is difficult to establish a standardized method that everyone can follow. However, to promote the development of the manuscript editing industry and overall quality improvement, it is essential to standardize manuscript editing-related tasks and it is highly important to make efforts to share related skills and knowledge. In addition, as the academic publishing environment changes, the role and demands of manuscript editors are continuing to change, making it increasingly necessary for manuscript editors to participate in training and workshops to remain up to date.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

References

Recommended practices for supplemental data

Hyun Jung Kwon1,2, Yoon Joo Seo1, Mi Yeon Kim3, Sue Yeon Chung2

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Abstract
Since various forms of supplemental data (SD) have been introduced in academic publications, it has become necessary to establish guidelines to systematically process, indicate, and distribute such data. This material aims to help the science journals establish rational SD policies and guidelines and to ensure compliance with such policies and to manage them consistently. Generally, SD can be approached in a literal way by categorizing ‘appendices’ as ‘additional or separately added complementary materials’ and ‘supplements’ as ‘materials supplemental to the research in a comprehensive sense’, rather than by viewing SD as an independent component of an article. The recommended practices of the National Information Standards Organization of USA advise the classification of SD into either ‘integral content’ or ‘additional content’ according to the content’s functional relationship to the associated article. If a public depository is used for SD, the author can ensure the perpetuity of data accessibility by assigning a digital object identifier. Science journals should adopt appropriate SD policies and describe them in detail in the instructions for authors to ensure consistent compliance with those policies. Additionally, they should be able to inspect and maintain links, repositories, and metadata associated with the SD for specific articles on an ongoing basis.

Keywords
Supplemental data; Supplementary materials; Appendix; Recommended practices

Introduction
In traditional academic publishing, the concept of supplemental data (SD) has historically referred only to non-critical collateral data posted in order to provide an additional reference or data including resources not presented in the main article due to technical reasons; such data are typically included at the end of the article in the form of an appendix. However, as the contents and format, including media, of materials used for academic publications—especially scientific publications—continue to undergo paradigm-shifting breakthroughs, SD has become massively diverse in content and format. Moreover, as the awareness of the importance of data
Recommended practices for supplemental data

Sharing has developed, the inclusion of SD has been expanding as an axis of these data availability.

However, confusion has mounted among the various parties involved in academic publishing in Korea, including journal publishers and manuscript editors, as these parties lack appropriate guidelines on how to process, indicate, archive, and distribute SD.

In light of these circumstances, we suggested establishing recommended practices for the appropriate and uniform treatment of SD at a workshop for the holders of a Korea Manuscript Editor Certification, hosted by the Korean Council of Science Editors, on July 12, 2019, and lively discussions among the participants followed this presentation.

Hence, by summarizing and publishing our presentation in this article, we aim to inspire the construction of complete and systematic guidelines so that the editors of scholarly journals can establish a reasonable SD policy covering items such as the selection of SD, criteria for repository, and regulation of the review process. Editors should be able to explain this policy in detail in the context of the instructions for authors to ensure consistent compliance and to effectively maintain related repositories and metadata.

Within this article, the definition of SD does not include supplementary databases on the level of journals or books, but rather specifically refers to additional content (AC) within an individual article. We focused on the processing of SD in a web-based environment, rather than on traditional print or PDF publications.

Concept of SD

With the recent heightened expectation that data sharing will advance science and improve the reproducibility of research, the usage of SD also has been greatly expanding. According to this modern understanding, data sharing should not only enable communications between colleagues but should also ensure unrestricted access to research-related information through archiving in a web-based platform. A data sharing policy should adopt the level of data sharing policy, select or recommend the appropriate repositories for each field, evince the data availability in the instructions for authors, and identify how to mention or cite these datasets in the body of an article. Establishing and implementing a proper data sharing policy is becoming not just a recommended measure, but a necessary step for academic journals. Over time, we have seen progressively more cases of famous and influential journals (or publishers) with higher impact factors establishing data sharing policies and requiring submissions to include research data in the form of SD or supplemental uniform resource locators (URLs). As an example of a Korean journal, the Journal of Educational Evaluation for Health Professions (JEEHP) delineates its data sharing policy in detail within its instructions for authors (https://www.jeehp.org/authors/authors.php) [1].

As previously mentioned, the conventional definition of SD is facing dramatic changes in response to the changing environment. Thus, we evaluated the guidelines provided for SD by major science editing committees.

Currently, many influential editing manuals do not provide detailed policies regarding SD beyond brief remarks. Thus, future enhancement of these guidelines is needed. The American Medical Association (AMA) [2] advises authors to post supplementary materials only if they are necessary. The AMA guidelines suggest that supplementary materials shall be indicated in the main text with a notation in the format of ‘Appendix 1’ and that such materials should be placed in front of the reference list at the end of an article. Additionally, the AMA recommends utilizing online-only materials for resources too onerous to be included in a print-version article for technical reasons; The AMA guidelines recommend providing a separate designation such as ‘eTable 1’ and providing readers with instructions on how to access these resources. The AMA guidelines also require that any supplementary materials undergo peer review and editorial processes similar to those undergone by the article itself. The guidelines of the American Psychological Association (APA) [3] present two different types of supplementary materials. If resources can be presented in print form because they are relatively short in length, they are to be classified as appendices; if resources are web-based and difficult to present in print form, they should be categorized as supplements. APA guidelines suggest that the former must be indicated as an ‘Appendix (if a single piece of material)’ or in the format of ‘Appendix A (if multiple materials are presented)’ in the main body. For web-based supplements, the content should be subjected to the peer review process; however, the materials are not required to be processed further to align with the format of the journal. The Council of Science Editors (CSE) [4] guide that materials that may obstruct the flow of context due to excessive length or detail should be added as appendices, but does not recommend publishing of such materials. The CSE guidelines provide only simple instructions to indicate these materials using the format of ‘Appendix’ or ‘Appendix 1’ if one or multiple appendices are included, respectively. Notably, CSE guidelines require appendices to be published online only.

The guidelines of the American Physiological Society [5] broadly categorize SD into three types: 1) SD that do not represent significant findings but can be used to assist in understanding an article; 2) source data, which corroborate the research findings; and 3) supporting information, which is provided only for peer review.

Based on our examination of various guidelines concerning SD, we believe that most scientific communities do not treat SD
as an independent part of an article, but rather treat SD in a liter-
al sense, by categorizing an appendix as ‘addtional or separately
added complementary materials’ and a supplement as ‘materials
supplemental to the research in a comprehensive sense.’ We can
conclude that there is a current lack of international standards for
the processing of SD, as the existing standards differ enormously
across disciplines and among individual journals.

**Standard Recommendations for American STM journals**

Like Korean scholarly communities, international journals
have experienced confusion and difficulties in processing SD.
Early on, many involved parties of American academic jour-
nals grappled with the problem of only a superficial review or
even an omission of the review process for a large proportion
of SD produced in online publishing environments, the treat-
ment of citation within SD, and SD processing methods, as
these often are not standardized even within an individual
journal. One might argue that the excessive and largely un-
regulated use of SD may be harmful to science [6]. In re-
response to such confusion, the National Information Standards
Organization (NISO) and the National Federation of Ad-
vanced Information Services of the United States organized a
working group with the goal of developing recommendations
to standardize SD policies. First officially convened in August
2010, the working group published standard recommenda-
tions in 2013 (Recommended Practices for Online Supplemen-
tal Journal Article Materials, https://www.niso.org/publica-
tions/niso-rp-15-2013-recommended-practices-online-sup-
plemental-journal-article-materials; Suppl 1). NISO’s Recom-
mended Practices (RPs) are intended to provide publishers
and editors with an international standard for general pro-
cessing guidelines for SD so that they can guide authors and
peer reviewers through the process. The NISO RPs are con-
sequential guidelines and could be considered as part of the es-
establishment of SD policies in Korean journals.

The NISO RPs consist of two parts. Part A contains prac-
tices recommended by the Business Working Group concern-
ing selecting, editing, managing and hosting materials, and
ensuring the discoverability of data. Part A also contains in-
formation about citation, retention of links, provision of ac-
ceptable metadata and context, archiving, and copyright man-
agement, as well as roles and responsibilities for various par-
ties as related to SD. Part B contains recommendations made
by the Technical Working Group and covers the more techni-
cal aspects of Part A, such as providing metadata, assigning
persistent identifiers (ID), archiving, and packaging and ex-
change.

The NISO RPs promote the categorization of SD into inte-
gral content (IC) and AC according to the full functional rela-
tionship between the SD and the article. IC refers to materials
that are essential for understanding the research, but that is
cluded in the article as SD for technical, business, or logisti-
cal reasons. AC refers to materials that are considered non-es-
tential but are included in the article as SD because they may
be useful for understanding the article contents. The NISO
RPs posit that the proportion of IC will become smaller as
technology advances. The RPs also recommend slightly dif-
f erent processing procedures between IC and AC with regard
to curation, hosting, and selection (including editorial evalua-
tion), editing, provision of reference information for other
publications, citation within SD, and preservation of the SD.
The relevant content is briefly summarized in Table 1. Since
IC and AC may be added either or both throughout the entire
lifecycle of a scientific article, each journal can adopt a flexible
definition of document type. RPs recommend that detailed
context be provided as metadata for SD files, which may in-
clude a persistent ID for part of or the entire set of SD files (or
objects); a persistent ID for the article; information regarding
the relationship type of the SD to the article (for IC, AC, or
both); a description of the SD, such as a title or summary; the
file name of, or an external link to, SD files; or the format of
the SD file. The guidelines also suggest recording bibliograph-
ic information in the SD file and assigning a direct bidirec-
tional link (for internal or external archiving) as well as an in-
dependent public ID, such as a digital object identifier (DOI),
DataCite DOI, or Protein Data Bank ID.

The NISO RPs’ two-pronged approach to SD processing
depending on the content of SD provides reasonable alterna-
tives to the points of confusion that processing SD uniformly
may cause. However, it must be considered that categorizing
SD, as advised by the NISO RPs, may be associated with diffi-
culties in determining each type of content.

**Making the SD**

While SD can take different forms depending on the journal
in which they are published, readers must be able to easily
recognize the presence of SD, and SD must be identifiable and
extractable for internal or external index databases or archives
and must be consistent throughout all articles published by a
single journal.

While SD can be given a variety of names—such as Supple-
mentary Material, Supplemental Material, or Supplementary
Information—each individual journal should impose a con-
sistent name used for all articles published in the journal. Like
figures or tables, SD should be numbered within an individual
article in order, and the SD itself should refer to the article it
belongs to in a consistent manner. Many journals in Korean
and international scientific communities utilize different SD policies; inserting pointers to SD within the main body, placing them as the separate element with links to SD in front of the reference list at the end of the article, or adding captions indicating the existence of SD on the title page. Journals may also choose two or more of the above methods. Regardless of the particular policy, it is crucial to place pointers in a consistent location within a journal, so that personnel does not omit them throughout the distribution chain and so that readers may easily spot them.

The NISO RPs state that the choice of whether to process SD to align with the house style of a journal or to publish SD in the original format can depend on the nature of the SD (IC or AC).

Each journal employs a different process to convert its articles into an offline version (e.g., PDF format) and an online version (e.g., XML format). When processing, SD should be handled with awareness of any discrepancies or omissions that may arise from creating two versions (online and offline). To avoid the discrepancies in SD due to dualization of the online and PDF versions, Nature Medicine makes the SD for an article accessible on the journal’s website by providing DOIs presented in the original article within the PDF provided in the website; and the source of the SD is mentioned as “Refer to the web version on PubMed Central for supplementary

| Table 1. Two types of supplemental data according to their functional relationship with the article |
|---|---|---|
| **Definition** | Essential for the full understanding of the work by the general scientist or reader in the journal’s discipline, but is placed outside the article for technical, operational, or logistical reasons. | Not essential to the understanding of the article. Additional, relevant, and useful expansion of the article in the form of text, figures, multimedia, or data. Helps all readers achieve a deeper understanding of the work through additional details and context. |
| **Example** | Descriptions of the methods needed to evaluate a study, review, or technical report. Detailed results required to comprehend the outcomes of a study, review, or technical report. Tables, figures, or multimedia files that provide primary data or information required to verify or to fully understand the work. | Expanded methods sections. Extended bibliographies. Additional supporting data or results. Copies of instruments/surveys. Multimedia and interactive representations of additional relevant and useful information. |
| **Curation and hosting** | In general, the publisher maintains responsibility for hosting and curating this content in the same way that the article itself is treated. For some specialized journals, content held in an external repository may be considered integral. | Generally, the author creates the content and the publisher hosts it or places it on the open web. |
| **Editorial evaluation** | Should be reviewed and published following the same standards as the article. | Should be reviewed following the same standards as the article. |
| **Editing** | Should be determined by the publisher and the editor. Best practice is to edit this content at the same level as the article. |
| **Reference in other publications** | Any citation of integral content should cite the article as a whole. Citing the content separately is not good practice. | The additional material is a more separable entity, and this content may be used for multiple purposes in multiple ways. References necessary for the support of additional content should be presented in a list separate from the article reference list, and placed within the additional content file. Some citations may be found in both the article reference list and in the additional content reference list. |
| **Citations within supplemental materials** | If the style guidelines permit, it is preferable to integrate the references necessary to support integral content into the reference list of the article, rather than creating a separate list. However, in numbered reference systems, preparing a separate reference list may be less confusing for the reader. | |
| **Preservation** | Should receive the same metadata markup as the article and be included in migration plans. For multimedia files, the accompanying text, which should include clear metadata, should be tagged appropriately. | Should receive the same tagging and markup as the article and be included in migration plans (to the extent possible). For multimedia files, the accompanying text, which should include clear metadata, should be tagged appropriately. |

*"However, additional content may be so voluminous that resources simply are not available for full review. In some instances, a reviewer may request these materials to allow a thorough review of the article itself, and the request should be honored. The content may or may not be published at the discretion of the editor in coordination with the author." If supplemental material is not edited, the fact that it is included as the author provided it should be noted within the content or on the landing page that leads to the content. Decisions about referencing additional content separately may depend upon the content itself. In some instances, this material may stand on its own. Subsequent authors who use this content extensively in their own research may wish to cite the additional content specifically. Some style guidelines advise authors to include the words “Supplemental Material” in their citations of the article. It is essential that there be sufficient elements to create a true citation that informs the reader about what is being cited. |
material” within the PDF provided via PubMed Central. Moreover, PubMed Central assigns a direct URL to each piece of SD included in each article, so the readers can access each SD set directly (e.g., https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6039259/).

**Table 2. Guidelines for Science Journal Group, Nature Journal Group, and American Geophysical Union**

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Science Journal Group</th>
<th>Nature Journal Group</th>
<th>American Geophysical Union&lt;br&gt;&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citations within supplemental data</td>
<td>Supplementary materials</td>
<td>Supplementary information</td>
<td>Supporting information</td>
</tr>
<tr>
<td>Allows a single reference list. The online version should include all references used in an article. The print version does not include references only cited in supplementary data.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Does not recommend including references within supplementary data.&lt;sup&gt;c&lt;/sup&gt;</td>
<td>References within supplementary data should be cited together in the main article, and included in the reference list of the main article.</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Supplementary data should be prepared using the template provided by the journal. Larger dataset files shall be stored in an appropriate data repository. In such cases, it is recommended to include the dataset file for reference; <sup>b</sup>References cited only in supplementary data should be included as increasing numbers in order, following the reference list of the main article; <sup>c</sup>If necessary, references cited within supplementary data should be included following the end of the reference list of the print version. The reference number continues from the reference list of the main article.

**SD and Citation**

SD can be important scholarly documents or resources on their own merit. Therefore, each journal must provide appropriate guidelines to ensure that SD are actively cited and reasonably evaluated. Although only a small number of institutions have established policies or guidelines related to citations of SD, there are some examples of guidelines regarding publication and citation (Table 2) that the Science Journal Group [7], the Nature Journal Group [8], and the American Geophysical Union [9] have adopted, as well as sample articles that include supplementary content in published materials (e.g., https://science.sciencemag.org/content/363/6424/276, https://www.nature.com/articles/s41467-019-10549-7#Sec19, and https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019EF001190). The NISO RPs also describe the citation of SD in relatively great detail (Table 1). However, even with guidelines in place, maintaining the integrity of these guidelines is a difficult task, as there are instances where a publication fails to comply with the standards accurately and consistently.

Apart from the citations of the SD themselves, if references are cited only within the SD but not in the main body of an article, processing such references is not a simple task. Whether to include such references in the reference list is an issue that extends beyond the concern of exceeding limits on the number of references. If a citation cannot be traced, this could raise an issue of fairness, as the reference would not be counted towards the impact factor. Conversely, if less important references are listed similarly to more important references of the main body, this could cause citation exaggeration, distortion of significance, and bias in the analysis [6]. Hence, we must find appropriate methods to thoroughly indicate and process references included in SD, as outlined in the following four examples.
The citation is indicated within the main body and included in the reference list

One potential method to reduce distortion or confusion is to indicate the citation number of a reference cited within the SD within an SD pointer in the main body, as well as including the reference in the main body’s reference list; an example of this format is as follows.

CompPASS employs a database of interacting proteins (including data for all baits reported here and an additional 102 unrelated proteins)\(^9\) and three specificity metrics (WDN-Score, an associated p-value, and Z-score) to identify HCIPs (Methods and Supplementary Fig. S2A–D\(^{10,11}\)).

However, this method may be troublesome to employ in journals that have not adopted a numeral citation system, do not place SD pointers within the main body, or set limits on the number of references. Moreover, if SD is classified as AC and the references cited in the supplemental content are treated similarly to the references cited in the main body, this could cause citation exaggeration.

A notice is posted that references are included in the SD in a separate SD pointer section, without marking the citations in the main body

The second method is to post a notice that SD contain references within the separately inserted SD pointer at the end of an article without identifying the citations for references of the SD in the main body. In this case, the references within the SD can be listed after the reference list of the main body. However, this method is also subject to the issues of reference limitation and citation exaggeration mentioned above for method 1.

Supplementary Materials

eTable A can be found in the online version of this article with 11 references.

Citations are not included in the main body, only in the SD

Even if a journal includes a separate reference list only for SD, while not indicating citations for the references within SD at the main body, the following concerns should be considered. First, should the same reference be allowed to be cited in the main body and the SD? Second, if a journal adopts a numeral citation system, how should the references in the SD be numbered (as in, should counting continue after the last number of the main-body reference list, or should a separate numbering system be started for the SD)? Third, if a significant reference is cited only in the SD, the literature may be undervalued in impact factor calculations.

Differentiated treatment according to the properties of SD

Finally, the treatment of SD can be differentiated between IC and AC, in reference to the NISO RPs. If references are included in the SD classified as IC, the citations of them should be noted in the main body and included in the reference list. If references are included in the SD classified as AC, the references should be noted separately within the SD or briefly pointed out in the main body as footnotes or other acceptable forms. While this is an elegant way to address the variety of issues noted above, the downside is an increased workload due to the necessity of determining the category under which each piece of SD falls.

Management of SD

Authors provide SD in various forms to improve the quality of their publications and to help readers better understand their research. However, on some occasions, SD may be omitted in the distribution chain of an article. One noteworthy example of such omission is the interlibrary loan process. If SD pointers are difficult to identify, librarians tend to proceed with the interlibrary loan without recognizing the existence of the SD. Furthermore, some journals do not provide separate download links for certain forms of SD (e.g., a video clip in an article; https://doi.org/10.1007/s00464-019-06849-0), and these SD are only accessible through right-clicking the original link in the publication. The proper distribution of the article may be thwarted by the unclear demarcation of SD pointers. In light of these concerns, each publisher should establish systematic policy measures to ensure the efficient distribution and management of SD. The NISO RPs also briefly introduce suggested methods of SD distribution; since a scholarly publication consists of the article, the SD, and metadata, the best method of distribution is the utilization of standardized web-based repository and packaging formats designed to enable the transmission of digital content. The NISO RPs particularly emphasize that such a distribution system is essential in interlibrary loan processes.

In addition to proper management, another responsibility of publishers is to properly archive SD. For the purpose of preservation, publishers may host their own archives or outsource specific archiving repositories. They also may only guide the criteria for acceptable repositories. Those criteria for an external repository may include public access, the capability of permanent preservation, and the availability of direct bidirectional links on the level of an individual dataset. Especially about IC SD, the NISO RPs suggest that it must undergo an archiving process similar to that used for the main article. They also recommend that publishers provide authors with a list of trusted repositories, then request resources from the listed repositories.
while storing multiple copies in several repositories to ensure the safety of the data. However, in practice, many journals [5,10-12] appear to inform authors that SD are to be archived in an appropriate repository and then link to that repository without classifying the SD into IC or AC (Table 3).

### Various Practices of SD Management

As mentioned above, procedures for processing SD widely differ across disciplines and among journals, and multiple terms exist for SD in general. A few examples of SD practices

<table>
<thead>
<tr>
<th>Journal</th>
<th>Data management</th>
<th>Type of storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Physiological Society Journals</td>
<td>If no community resources are available, SD are stored in a public repository.</td>
<td>figshare, Github, protocols.io, Zenodo</td>
</tr>
<tr>
<td>BMJ Open</td>
<td>SD and raw data should be linked via a proper repository, rather than posting them online with the main article.</td>
<td>Dryad, figshare</td>
</tr>
<tr>
<td>PLoS One</td>
<td>The author stores data in an appropriate repository of his or her choice. The file format should be chosen to enable efficient extraction (tables should be prepared in spreadsheet form, rather than as PDFs.)</td>
<td>A list is provided of repositories appropriate for each field of study (e.g., for multidisciplinary research: Dryad Digital Repository, figshare, Harvard Dataverse Network, Open Science Framework, Zenodo).</td>
</tr>
<tr>
<td>Endocrine Reviews</td>
<td>When an article is submitted, supplementary data should not be uploaded to the submission system. Authors should use a community-recognized repository if available, or a public repository.</td>
<td>Re3data, NIH Data Repositories and Trusted Partners, NIH Data Sharing Repositories, Dryad Digital Repository, figshare</td>
</tr>
</tbody>
</table>

SD, supplemental data; NIH, National Institutes of Health.

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**Fig. 1.** An example of archiving research materials in figshare, an archiving repository. Informed consent forms (A) and quizzes and booklets (B) distributed to research subjects (https://doi.org/10.6084/m9.figshare.8064116).
are presented in Figs. 1-5. One article in *Advances in Physiology* indicated in the main body that informed consent forms, quizzes, and booklets used in research are archived in a repository, and we can confirm that these resources are deposited in figshare as SD (Fig. 1). The *Journal of the American Heart Association* includes all search strategies used in each database for literature reviews and references used in meta-analyses as SD (Fig. 2). *Circulation* presents all members of the group identified as an author as appendix (Fig. 3); if an article has the group author, including the members’ names as SD is one potential alternative to listing every author on the title page. *Nutrients* provides a direct link to a repository hosted by the journal instead of archiving SD in a public repository (Fig. 4). On the other hand, JEEHP archives SD, such as raw data, in the Harvard Dataverse, a public repository (Fig. 5). Finally, *The Korean Journal of Physiology & Pharmacology* provides direct links to a server managed by its publishing company, which is rare for a Korean journal. However, this practice is not recommended, as these private servers are not as stable as public repositories. In such cases, publishers need to consider a backup repository due to this inherent instability. If each publisher adopts a method that fits their situation while considering the research conducted in the context of a variety of precedents, we believe that more systematic management of SD will be possible.

**Table 51. Search terms.**

<table>
<thead>
<tr>
<th>Search term</th>
<th>EMBASE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>2,600</td>
<td>1,000</td>
<td>1,800</td>
<td>1,000</td>
<td>1,200</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Heart attack</td>
<td>1,000</td>
<td>800</td>
<td>1,800</td>
<td>1,200</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>800</td>
<td>600</td>
<td>1,000</td>
<td>600</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Acute coronary syndrome</td>
<td>1,000</td>
<td>1,200</td>
<td>1,800</td>
<td>1,500</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>800</td>
<td>600</td>
<td>1,000</td>
<td>600</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Coronary artery obstruction</td>
<td>1,000</td>
<td>1,200</td>
<td>1,800</td>
<td>1,500</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Cardiogenic shock</td>
<td>200</td>
<td>400</td>
<td>700</td>
<td>500</td>
<td>200</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Perioperative coronary intervention</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Coronary artery surgery</td>
<td>200</td>
<td>400</td>
<td>700</td>
<td>500</td>
<td>200</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Angioplasty</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Coronary atherosclerosis</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td></td>
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<tr>
<td>Coronary artery bypass</td>
<td>200</td>
<td>400</td>
<td>700</td>
<td>500</td>
<td>200</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>CABG</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>PCI and CABG</td>
<td>200</td>
<td>400</td>
<td>700</td>
<td>500</td>
<td>200</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>800</td>
<td>600</td>
<td>1,000</td>
<td>600</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>800</td>
<td>600</td>
<td>1,000</td>
<td>600</td>
<td>1,000</td>
<td>1,200</td>
<td></td>
</tr>
</tbody>
</table>

**Table 52. Characteristics of papers included in unabridged, abridged, and additional analyses.**

<table>
<thead>
<tr>
<th>Journal</th>
<th>Global</th>
<th>Analyzed</th>
<th>Binned</th>
<th>Abridged</th>
<th>Abridged</th>
<th>Abridged</th>
<th>Abridged</th>
<th>Abridged</th>
<th>Abridged</th>
</tr>
</thead>
<tbody>
<tr>
<td>JEEHP</td>
<td>2,600</td>
<td>1,000</td>
<td>1,800</td>
<td>1,200</td>
<td>1,000</td>
<td>1,200</td>
<td>1,200</td>
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</tr>
<tr>
<td>JEAHP</td>
<td>1,000</td>
<td>800</td>
<td>1,000</td>
<td>600</td>
<td>1,000</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
</tr>
</tbody>
</table>

**Fig. 2.** An example of including the references and the search strategies used for literature reviews and meta-analyses as supplemental materials (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6512085/).

**Fig. 3.** An example of listing a group as an author then including the members of the group as an appendix (https://www.ahajournals.org/doi/10.1161/01.CIR.0000156444.26393.80).

**Fig. 4.** An example of including the references and the search strategies used for literature reviews and meta-analyses as supplemental materials (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6512085/).

**Fig. 5.** An example of listing a group as an author then including the members of the group as an appendix (https://www.ahajournals.org/doi/10.1161/01.CIR.0000156444.26393.80).

**Supplemental References:**

Fig. 4. An example of archiving supplemental materials elsewhere than in a public repository (https://www.mdpi.com/2072-6643/11/7/1502).

Fig. 5. An example of archiving supplemental materials in a public repository (Harvard Dataverse) (https://doi.org/10.3352/jeehp.2018.15.33).

Conclusion

We have analyzed guidelines related to SD in scientific publications and actual practices in various journals. However, there are limitations to the establishment of concise and firm guidelines that can be applied to SD processing in the publication of Korean STM journals. Therefore, more case studies and discussions of Korean publishers must follow.

However, we believe that this article has fulfilled its purpose if it helps enhance understanding of best practices for SD and to form a subsequent consensus on editors’ roles and responsibilities. First, scientific journal editors should adopt a
reasonable SD policy considering the characteristics of the journal, the convenience of authors and readers, and the accessibility of online and offline publishing. Moreover, the details of the SD policy—including the selection of supplemental materials, regulations on formats for each type of SD, media, handling IDs and URLs, repository standards, and review standards—must be clearly posted in the instructions for authors. Second, editors must ensure consistent compliance with these established SD processing methods. Third, links, repositories, and metadata related to the published article should be regularly inspected and maintained, and the rules should be updated on an ongoing basis in search for a more sustainable and effective way to align with the shifting landscape of the web environment.

Furthermore, we must continue to emphasize that the publication of scientific articles is transforming from a linear form centered around the print version into an online-based multilateral form. Thus, in response to this ever-changing environment, we believe that it is especially important to pursue flexibility in a way that is grounded in fundamental principles, rather than through strict regulations.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Acknowledgments

The authors would like to express our sincere gratitude to Sun-Im Ryu, Se Jueng Kim, and Ji Hi Jung for investigating, analyzing, and organizing the various ways in which SD are presented in the many journals included this publication.

Supplementary Material

Supplementary file is available from https://doi.org/10.6087/kcse.200


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7. Science. Instructions for preparing an initial manuscript [Internet]. Washington, DC: American Association for the Advancement of Science [cited 2019 Sep 15]. Available from: https://www.sciencemag.org/authors/instructions-preparing-initial-manuscript
Materials and methods

Beom Sun Chung, Min Suk Chung
Department of Anatomy, Ajou University School of Medicine, Suwon, Korea

When I teach my students to write an article, I make them write the materials and methods section first. Then they write the results, followed by the introduction and discussion. The “materials and methods, results” sections do not vary much depending on the writer, whereas the “introduction and discussion” sections can be quite different. Of course, the more experience the students have, the better they can write.
Suppose a university (or a research center) is filming a promotional video. The videographer would film scientists as they conduct experiments, not as they work on articles. This might be because conducting experiments would make the scientists look hardworking. In contrast, writing articles would make them look sluggish, even though writing articles is actually trickier.

In reality, unlike what this comic strip tells, the authors try to be the one who pays for the fee associated with journal publishing. This fee is just a small amount of money compared to the gain from the journal article. Moreover, the authors often receive financial support from their institutions or research foundations. In general, scientists publishing articles are not poor.
Sometimes in an elevator, people ask me how I am doing. When I am not in a good mood, I reply, “Ask more specifically about what you want to know. In terms of what? Education, research, or something else?” When you meet someone in an elevator, make your question short and specific, and you will promptly find out what you are curious about. Time matters.

When teaching students, changing your plans frequently may undermine your authority. A student might ask you to postpone the test date for no objective reason. If you accept that request, it will be hard for you to decline next time. Therefore, do not move your test date, except in cases of natural disasters or similar emergencies. You need to stand up for your authority through consistency.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.
Announcement

Events in 2020

The Korean Council of Science Editors announces the schedule of the events in 2020. The precise schedule and the registration information of the workshops were or will be available from: https://www.kcse.org

| Table 1. Schedule of the events by the Korean Council of Science Editors in 2020 |
|-----------------------------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Jan   | Feb   | Mar   | Apr   | May   | Jun   |
| Science Editing (twice a year) | Vol.7 No.1 (20) | No. 33 (31) | | No. 34 (30) |
| Newsletter (4 times a year) | 2020 Preconference Workshop (17) | Basic Manuscript Editing (12, 19, 26) | Basic Manuscript Editing (2, 9, 16, 23, 29) | Manuscript Editor’s Workshop (14) |
| Editor’s Workshop | | | | |
| Manuscript Editor’s Training & Workshop | | | | |
| Publication Ethics Workshop | | | | |
| July | Aug | Sept | Oct | Nov | Dec |
| Science Editing (twice a year) | Vol.7 No.2 (20) | No. 35 (30) | | No. 36 (31) |
| Newsletter (4 times a year) | | | | |
| Editor’s Workshop | | | | Editor’s Workshop (20) |
| Manuscript Editor’s Training & Workshop | | | | Examination for Korea Manuscript Editors Certification (21) |
| Manuscript Editor’s Certificate Workshop (10-11) | | | |
| Basic Manuscript Editing (15-16) | | |
| Publication Ethics Workshop | | | | Publication Ethics Workshop (27) |
| | | | |
| | | | |

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Instructions to Authors

Enacted January 1, 2014
1st revised August 20, 2018
Recently revised February 20, 2019

1. General information

Science Editing (Sci Ed) is the official journal of the Korean Council of Science Editors (KCSE) and Council of Asian Science Editors (CASE). Anyone who would like to submit a manuscript is advised to carefully read the aims and scope section of this journal. Manuscripts should be prepared for submission to Science Editing according to the following instructions. For issues not addressed in these instructions, the author is referred to the International Committee of Medical Journal Editors (ICMJE) “Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals” (http://www.icmje.org). It also adheres completely to the Principles of Transparency and Best Practice in Scholarly Publishing (joint statement by COPE, DOAJ, WAME, and OASPA; http://doaj.org/bestpractice) if otherwise not described below.

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A submitted manuscript, when published, will become the property of the journal. Copyrights of all published materials are owned by KCSE. The Creative Commons Attribution License available from: http://creativecommons.org/licenses/by/4.0/ is also in effect.

3. Research and publication ethics

The journal adheres to the ethical guidelines for research and publication described in Guidelines on Good Publication (http://publicationethics.org/resources/guidelines) and the ICMJE Guidelines (http://www.icmje.org).

1. Authorship

Authorship credit should be based on 1) substantial contributions to conception and design, acquisition of data, and/or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; 3) final approval of the version to be published; and 4) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Every author should meet all of these four conditions. After the initial submission of a manuscript, any changes whatsoever in authorship (adding author(s), deleting author(s), or re-arranging the order of authors) must be explained by a letter to the editor from the authors concerned. This letter must be signed by all authors of the paper. Copyright assignment must also be completed by every author.

• Corresponding author and first author: Science Editing does not allow multiple corresponding authors for one article. Only one author should correspond with the editorial office and readers for one article. Science Editing does accept notice of equal contribution for the first author when the study was clearly performed by co-first authors.

• Correction of authorship after publication: Science Editing does not correct authorship after publication unless a mistake has been made by the editorial staff. Authorship may be changed before publication but after submission when an authorship correction is requested by all of the authors involved with the manuscript.

2. Originality, plagiarism and duplicate publication

Submitted manuscripts must not have been previously published or be under consideration for publication elsewhere. No part of the accepted manuscript should be duplicated in any other scientific journal without the permission of the Editorial Board. Submitted manuscripts are screened for possible plagiarism or duplicate publication by Similarity Check upon arrival. If plagiarism or duplicate publication is detected, the manuscripts may be rejected, the authors will be announced in the journal, and their institutions will be informed. There will also be penalties for the authors.

A letter of permission is required for any and all material that has been published previously. It is the responsibility of the author to request permission from the publisher for any material that is being reproduced. This requirement applies to text, figures, and tables.
3. Secondary publication
It is possible to republish manuscripts if the manuscripts satisfy the conditions of secondary publication of the ICMJE Recommendations (http://www.icmje.org/urm_main.html).

4. Conflict of interest statement
The corresponding author must inform the editor of any potential conflicts of interest that could influence the authors' interpretation of the data. Examples of potential conflicts of interest are financial support from or connections to companies, political pressure from interest groups, and academically related issues. In particular, all sources of funding applicable to the study should be explicitly stated.

5. Statement of human and animal right
Clinical research should be done in accordance of the Ethical Principles for Medical Research Involving Human Subjects, outlined in the Helsinki Declaration of 1975 (revised 2013), available from: https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/. Clinical studies that do not meet the Helsinki Declaration will not be considered for publication. Human subjects should not be identifiable, such that patients’ names, initials, hospital numbers, dates of birth, or other protected health care information should not be disclosed. For animal subjects, research should be performed based on the National or Institutional Guide for the Care and Use of Laboratory Animals, and the ethical treatment of all experimental animals should be maintained.

6. Statement of informed consent and institutional review board approval
Copies of written informed consent documents should be kept for studies on human subjects, which includes identifiable information or sensitive information. For clinical studies of human subjects, a certificate, agreement, or approval by the Institutional Review Board (IRB) of the author’s institution is required. If necessary, the editor or reviewers may request copies of these documents to resolve questions about IRB approval and study conduct.

7. Process for managing research and publication misconduct
When the journal faces suspected cases of research and publication misconduct such as redundant (duplicate) publication, plagiarism, fraudulent or fabricated data, changes in authorship, an undisclosed conflict of interest, ethical problems with a submitted manuscript, a reviewer who has appropriated an author’s idea or data, complaints against editors, and so on, the resolution process will follow the flowchart provided by the Committee on Publication Ethics (http://publicationethics.org/resources/flowcharts). The discussion and decision on the suspected cases are carried out by the Editorial Board.

8. Process for handling cases requiring corrections, rejections, and editorial expressions of concern
Cases that require editorial expressions of concern or retrac tion shall follow the COPE flowcharts available from: http://publicationethics.org/resources/flowcharts. If correction needs, it will follow the ICMJE Recommendation for Corrections, Retractions, Reproductions and Version Control available from: http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/corrections-and-version-control.html. Honest errors are a part of science and publishing and require publication of a correction when they are detected. Corrections are needed for errors of fact. Minimum standards are as follows: First, it shall publish a correction notice as soon as possible detailing changes from and citing the original publication on both an electronic and numbered print page that is included in an electronic or a print Table of Contents to ensure proper indexing; Second, it shall post a new article version with details of the changes from the original version and the date(s) on which the changes were made through Crossmark; Third, it shall archive all prior versions of the article. This archive can be either directly accessible to readers; and Fourth, previous electronic versions shall prominently note that there are more recent versions of the article via Crossmark.

9. Editorial responsibilities
The Editorial Board will continuously work to monitor and safeguard publication ethics: guidelines for retracting articles; maintenance of the integrity of the academic record; prevention of business needs from compromising intellectual and ethical standards; publishing corrections, clarifications, retractions, and apologies when needed; and excluding plagiarism and fraudulent data. The editors maintain the following responsibilities: responsibility and authority to reject and accept articles; avoiding any conflict of interest with respect to articles they reject or accept; promoting publication of corrections or retractions when errors are found; and preservation of the anonymity of reviewers.

4. Author qualifications, language requirement, and reporting guideline
1. Author qualifications
Any researcher throughout the world can submit a manuscript if the scope of the manuscript is appropriate.
2. Language
Manuscripts should be submitted in good scientific English.

3. Reporting guidelines for specific study designs
Research reports frequently omit important information. As such, reporting guidelines have been developed for a number of study designs that some journals may ask authors to follow. Authors are encouraged to also consult the reporting guidelines relevant to their specific research design. A good source of reporting guidelines is the EQUATOR Network (http://www.equator-network.org/home/) and the United States National Institutes of Health/National Library of Medicine (http://www.nlm.nih.gov/services/research_report_guide.html).

5. Submission and peer review process

1. Submission
All manuscripts should be submitted via e-submission system available from: https://submit.escienceediting.org/. If any authors have difficulty in submitting via e-submission system, please send a manuscript to kcse@kcse.org by the corresponding author.

2. Peer review process
Science Editing reviews all manuscripts received. A manuscript is first reviewed for its format and adherence to the aims and scope of the journal. If the manuscript meets these two criteria, it is checked for plagiarism or duplicate publication with Similarity Check. After confirming its result, it is dispatched to three investigators in the field with relevant knowledge. Assuming the manuscript is sent to reviewers, Science Editing waits to receive opinions from at least two reviewers. In addition, if deemed necessary, a review of statistics may be requested. The authors’ names and affiliations are removed during peer review (double-blind peer review). The acceptance criteria for all papers are based on the quality and originality of the research and its scientific significance. Acceptance of the manuscript is decided based on the critiques and recommended decision of the reviewers. An initial decision will normally be made within 4 weeks of receipt of a manuscript, and the reviewers’ comments are sent to the corresponding author by e-mail. The corresponding author must indicate the alterations that have been made in response to the reviewers’ comments item by item. Failure to resubmit the revised manuscript within 4 weeks of the editorial decision is regarded as a withdrawal. If further revision period is required, author should contact editorial office through form mail available from: https://www.escienceediting.org/about/contact.php. A final decision on acceptance/rejection for publication is forwarded to the corresponding author from the editor.

3. Peer review process for handling submissions from editors, employees, or members of the editorial board
All manuscripts from editors, employees, or members of the editorial board are processed same to other unsolicited manuscripts. During the review process, submitters will not engage in the selection of reviewers and decision process. Editors will not handle their own manuscripts although they are commissioned ones.

6. Manuscript preparation

1. General requirements
- The main document with manuscript text and tables should be prepared in an MS Word (docx) or RTF file format.
- The manuscript should be double spaced on 21.6×27.9 cm (letter size) or 21.0×29.7 cm (A4) paper with 3.0 cm margins at the top, bottom, right, and left margin.
- All manuscript pages are to be numbered at the bottom consecutively, beginning with the abstract as page 1. Neither the author’s names nor their affiliations should appear on the manuscript pages.
- The authors should express all measurements according to International System (SI) units with some exceptions such as seconds, mmHg, or °C.
- Only standard abbreviations should be used. Abbreviations should be avoided in the title of the manuscript. Abbreviations should be spelled out when first used in the text—for example, extensible markup language (XML)—and the use of abbreviations should be kept to a minimum.
- The names and locations (city, state, and country only) of manufacturers should be given.
- When quoting from other sources, a reference number should be cited after the author’s name or at the end of the quotation.

Manuscript preparation is different according to the publication type, including original articles, reviews, case studies, essays, training materials, editorials, book reviews, correspondence, and video clips. Other types are also negotiable with the Editorial Board.

2. Original articles
Original articles are reports of basic investigations. The manuscript for an original article should be organized in the following sequence: title page, abstract and keywords, main text (introduction, methods, results, and discussion), conflict of interest, acknowledgments, references, tables, figure legends, and figures. The figures should be received as separate files. Maximum length: 2,500 words of text (not including the ab-
abstract, tables, figures, and references) with no more than a total of 10 tables and/or figures.

- **Title page:** The following items should be included on the title page: 1) the title of the manuscript, 2) author list, 3) each author’s affiliation, 4) the name and e-mail address of the corresponding author, 5) when applicable, the source of any research funding and a list of where and when the study has been presented in part elsewhere, and 6) a running title of fewer than 50 characters.

- **Abstract and keywords:** The abstract should be concise content of equal to or less than 250 words in an structured format including purpose, methods, results, and conclusion. Abbreviations or references are not allowed in the abstract. Up to 5 keywords should be listed at the bottom of the abstract to be used as index terms.

- **Introduction:** The purpose of the investigation, including relevant background information, should be described briefly. Conclusion should not be included in the Introduction.

- **Methods:** The research plan, materials (or subjects), and methods used should be described in that order. The names and locations (city, state, and country only) of manufacturers of equipment and software should be given. Methods of statistical analysis and criteria for statistical significance should be described.

- **Results:** The results should be presented in logical sequence in the text, tables, and figures. If resulting parameters have statistical significance, P-values should be provided, and repetitive presentation of the same data in different forms should be avoided. The results should not include material appropriate for the discussion.

- **Discussion:** Observations pertaining to the results of the research and other related work should be interpreted for readers. New and important observations should be emphasized rather than merely repeating the contents of the results. The implications of the proposed opinion should be explained along with its limits, and within the limits of the research results, and the conclusion should be connected to the purpose of the research. In a concluding paragraph, the results and their meaning should be summarized.

- **ORCID (Open Researcher and Contributor ID):** ORCID of all authors should be described.

- **Conflict of interest:** Any potential conflict of interest that could influence the authors’ interpretation of the data, such as financial support from or connections to companies, political pressure from interest groups, or academically related issues, must be stated.

- **Acknowledgments:** All persons who have made substantial contributions, but who have not met the criteria for authorship, are to be acknowledged here. All sources of funding applicable to the study should be stated here explicitly.

- **Appendix:** If any materials are not enough to be included in the main text such as questionnaires, they can be listed in the Appendix.

- **Supplementary materials:** If there are any supplementary materials to help the understanding of readers or too great amount data to be included in the main text, it may be placed as supplementary data. Not only text, audio or video files, but also data files should be added here.

- **References:** In the text, references should be cited with Arabic numerals in brackets, numbered in the order cited. In the references section, the references should be numbered and listed in order of appearance in the text. The number of references is limited to 20 for original articles. All authors of a cited work should be listed if there are six or fewer authors. The first three authors should be listed followed by “et al.” if there are more than six authors. If a reference has a digital object identifier (DOI), it should be supplied. Other types of references not described below should follow The NLM Style Guide for Authors, Editors, and Publishers (http://www.nlm.nih.gov/citingmedicine).

### Journal articles:


(In case number of authors is over 6)


### Books and book chapters:


### Online sources:


7. Testa J. The Thomson Reuters journal selection process [Internet]. Philadelphia, PA: Thomson Reuters; 2012 [cit-

Conference papers:
8. Shell ER. Sex and the scientific publisher: how journals and journalists collude (despite their best intentions) to mislead the public. Paper presented at: 2011 CrossRef Annual Member Meeting; 2011 Nov 14-15; Cambridge, MA, USA.

Scientific and technical reports:

News articles:

Dissertations:

- Tables: Tables are to be numbered in the order in which they are cited in the text. A table title should concisely describe the content of the table so that a reader can understand the table without referring to the text. Each table must be simple and typed on a separate page with its heading above it. Explanatory matter is placed in footnotes below the tabular matter and not included in the heading. All non-standard abbreviations are explained in the footnotes. Footnotes should be indicated by a1, a2, a3, ... Statistical measures such as standard deviation (SD) or standard error (SE) should be identified. Vertical rules and horizontal rules between entries should be omitted.

- Figures and legends for illustrations: Figures should be numbered, using Arabic numerals, in the order in which they are cited. Each figure should be uploaded as a single image file in either uncompressed EPS, TIFF, PSD, JPEG, and PPT format over 600 dots per inch (dpi) or 3 million pixels (less than 6 megabytes). Written permission should be obtained for the use of all previously published illustrations (and copies of permission letters should be included). In the case of multiple prints bearing the same number, English letters should be used after the numerals to indicate the correct order (e.g., Fig. 1A; Fig. 2B, C).

3. Reviews
Reviews are invited by the editor and should be comprehensive analyses of specific topics. They are to be organized as follows: title page, abstract and keywords, main text (introduction, text, and conclusion), conflict interest, acknowledgments, references, tables, figure legends, and figures. There should be an unstructured abstract of no more than 200 words. The length of the text excluding references, tables, and figures should not exceed 5,000 words. The number of references is limited to 100.

4. Case studies
Case studies are intended to report practical cases that can be encountered during editing and publishing. Examples include interesting cases of research misconduct and publication ethics violations; experience of new and creative initiatives in publishing; and the history of a specific journal development. They are to be organized as follows: title page, abstract and keywords, main text (introduction, text, and conclusion), conflict interest, acknowledgments, references, tables, figure legends, and figures. There should be an unstructured abstract of 200 words maximum. The length of the text excluding references, tables, and figures should not exceed 2,500 words. The number of references is limited to 100.

5. Essays
Essays are for the dissemination of the experience and ideas of editors for colleague editors. There is no limitation on the topics if they are related to editing or publishing. They are to be organized as follows: title page, main text (introduction, text, and conclusion), conflict interest, acknowledgments, references, tables, figure legends, and figures. The length of the text excluding references, tables, and figures should not exceed 2,500 words. The number of references is limited to 20.

6. Training materials
Training materials are for training editors or publishers. If there are new standards, policies, technologies, guidelines or trends, they can be submitted for training editors or publishers. It may be unsolicited or commissioned. This publication type will be able to provide the practical information for the journal advancement. They are to be organized as follows: title page, abstract and keywords, main text (introduction, text, and conclusion), conflict interest, acknowledgments, references, tables, figure legends, and figures. There should be an unstructured abstract of 200 words maximum. The length of the text excluding references, tables, and figures should not exceed 2,500 words. The number of references is limited to 20.
7. Editorials
Editorials are invited by the editor and should be commentaries on articles published recently in the journal. Editorial topics could include active areas of research, fresh insights, and debates in all fields of journal publication. Editorials should not exceed 1,000 words, excluding references, tables, and figures. References should not exceed 10. A maximum of 3 figures including tables is allowed.

8. Book reviews
Book reviews are solicited by the editor. These will cover recently published books in the field of journal publication. The format is same as that of Editorials.

9. Correspondence
Correspondence (letters to the editor) may be in response to a published article, or a short, free-standing piece expressing an opinion. Correspondence should be no longer than 1,000 words of text and 10 references.

In reply: If the Correspondence is in response to a published article, the Editor-in-Chief may choose to invite the article’s authors to write a Correspondence Reply. Replies by authors should not exceed 500 words of text and 5 references.

10. Video clips
Video clips can be submitted for placement on the journal website. All videos are subject to peer review and must be sent directly to the editor by e-mail. A video file submitted for consideration for publication should be in complete and final format and at as high a resolution as possible. Any editing of the video will be the responsibility of the author. Science Editing accepts all kinds of video files not exceeding 30 MB and of less than 5 minutes duration, but Quicktime, AVI, MPEG, MP4, and RealMedia file formats are recommended. A legend to accompany the video should be double-spaced in a separate file. All copyrights for video files after acceptance of the main article are automatically transferred to Science Editing.

11. Commissioned or unsolicited manuscripts
Unsolicited manuscript with publication types of original articles, case studies, essays, training materials, video clips, and correspondence can be submitted. Other publication types are all commissioned or invited by the Editorial Board.

Table 1 shows the recommended maximums of manuscripts according to publication type; however, these requirements are negotiable with the editor.

| Table 1. Recommended maximums for articles submitted to Science Editing |
|-----------------------------------|-----------------|--------|---------|
| Type of article | Abstract (word) | Text (word)
| (word) | |
| Original article | 250 | 2,500 | 20 |
| Review | 200 | 5,000 | 100 |
| Case study | 200 | 2,500 | 20 |
| Training material | 200 | 2,500 | 20 |
| Essay | No | 2,500 | 20 |
| Editorial | No | 1,000 | 10 |
| Book review | No | 1,000 | 10 |
| Correspondence | No | 1,000 | 10 |
| Letter to the editor | No | 1,000 | 10 |
| In reply | No | 500 | 5 |
| Video clip | No | 30 MB, 5 min | - |

*Maximum number of words is exclusive of the abstract, references, tables, and figure legends.

7. Final preparation for publication

1. Final version
After the paper has been accepted for publication, the author(s) should submit the final version of the manuscript. The names and affiliations of the authors should be double-checked, and if the originally submitted image files were of poor resolution, higher resolution image files should be submitted at this time. Color images must be created as CMYK files. The electronic original should be sent with appropriate labeling and arrows. The EPS, TIFF, Adobe Photoshop (PSD), JPEG, and PPT formats are preferred for submission of digital files of photographic images. Symbols (e.g., circles, triangles, squares), letters (e.g., words, abbreviations), and numbers should be large enough to be legible on reduction to the journal’s column widths. All of the symbols must be defined in the figure caption. If the symbols are too complex to appear in the caption, they should appear on the illustration itself, within the area of the graph or diagram, not to the side. If references, tables, or figures are moved, added, or deleted during the revision process, they should be renumbered to reflect such changes so that all tables, references, and figures are cited in numeric order.

2. Manuscript corrections
Before publication, the manuscript editor may correct the manuscript such that it meets the standard publication format. The author(s) must respond within 2 days when the editor
contacts the author for revisions. If the response is delayed, the manuscript’s publication may be postponed to the next issue.

3. Galley proof
The author(s) will receive the final version of the manuscript as a PDF file. Upon receipt, within 2 days, the editorial office (or printing office) must be notified of any errors found in the file. Any errors found after this time are the responsibility of the author(s) and will have to be corrected as an erratum.

8. Page charges or article processing charges
No page charge or article processing charge applies. There is also no submission fee.

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**NOTICE:** These instructions to authors will be applied beginning with the February 2019 issue.
Compliance of *Science Editing* to the Principles of transparency and best practice in scholarly publishing

(joint statement by COPE, DOAJ, WAME, and OASPA; http://doaj.org/bestpractice)

*Posted in July 7, 2018 and printed in February 20, 2019*

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ii. ’Aims & Scope’ statement: It is described at the masthead page.
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iv. Authorship criteria: It is described at the Instructions to authors.
v. Duplicate submission and redundant publication: It is described at the Instructions to authors.
vi. pISSN: 2288-7474 eISSN: 2588-8063

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The governing body is the journal’s editorial board.

6. Editorial team and contact information
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