



Plans towards open access

Kihong Kim

Department of Physics, Ajou University, Suwon, Korea

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

Received: February 5, 2020

Accepted: February 5, 2020

Correspondence to Kihong Kim
khkim@ajou.ac.kr

ORCID

Kihong Kim

<https://orcid.org/0000-0001-9965-3535>

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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.

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