

Two Approaches to the Internetization of Research under Globalization

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In the epoch of globalization, the Internet has dramatically changed the situation in the sphere of research communications, arousing great concern among library workers, subscription agencies, research periodical publishers, research managers, and researchers themselves. In this connection, publishers demand better regulation of access to scientific and scholarly knowledge, as, according to their estimation, it endangers the traditional market for scientific periodicals, which is worth three billion US dollars annually and employs ten thousand people.

The crisis in the system that gripped this market in the 1990s gave rise to a strong movement for open access to scientific and scholarly knowledge. This open access movement resulted in ubiquitous institutional electronic archives (libraries and repositories) with open access to scientific publications (OA archives) and online research journals. Professor Steven Harnad of Southampton University (United Kingdom), one of the ideologists of the movement, suggested differentiating between the processes of depositing publications in OA archives and opening access to them. In his opinion, a paper should be archived immediately after the journal accepts it, while open access to the article may be delayed, depending on publishers' self-archiving policies and applicable embargoes (the period of time between the appearance of an article and access to it). This procedure was embodied as the Immediate Deposit/Optional Access (ID/OA) Mandate (<http://openaccess.eprints.org/index.php?/archives/71-guid.html>).

Many countries have adopted such mandates for publicly-funded research results at the highest level. Recently, the European Commission, also adopted the ID/OA Mandate, although debates over reducing the embargo set by publishers to six months are still going on. Since January 17, 2007, the Petition for Guaranteed Public Access to Publicly-Funded Research Results has collected about 25 500 signatures. Today, people may still sign this Internet petition to register their support for free and open access to European research at www.ec-petition.eu. As well as the above-mentioned setting of the embargo at no more than six months following publication, the petition emphasizes that self-

archiving could become a condition for funding research.

Another issue of current sharp debate in the online research community is that of who should pay for open access to scientific and scholarly knowledge. The majority agrees that it would be reasonable to test different business models, such as author- or reader-pay models, library subscription funding, and so on, and combine them.

Thus, Barbara Kalumenos of Elsevier introduced the notion of the sponsored article, which corresponds to the author-pay model. She suggested that open access to papers in the Elsevier journals should be paid at a rate of USD3000 per article. At the present time, only 0.1 percent of the authors of scientific papers have chosen this option. It is expected that opening access to Elsevier articles via the ScienceDirect platform right now would entail a loss in the publishing house's profits equal to the above-mentioned amount. However, this, in our opinion, refers to their super-profits, because such a type of access does not include the cost of regular journal subscription, which is as high as approximately USD1000 a year. Indeed, the price of one article sold via the ScienceDirect platform is about USD30; hence, we infer that Elsevier, in addition to normal subscription proceeds (1882 journals \times USD1000 \approx USD2000000), has a potential revenue from selling one hundred electronic copies (USD3000/USD30 = 100) of each article, which may exceed the revenues from subscription by an order of magnitude. At the same time, for online scientific journals, the publishers of which do not have subscription revenues, such a model is quite reasonable, because except for journal production and archiving expenditure, publishers bear heavy expenses paying referees and Internet providers for their services. For example, the price of one publication in the high-citation online journals *PLoS Biology* and *PLoS Medicine* (www.plos.org) is USD2500. It is understood that authors should include the price of publications in their grant applications. For those contributors who do not have access to funds, the price in all Public Library of Science (PLoS) journals decreases to USD1500. The statistics of this public scientific library show that the

majority of authors (80–90%) can afford such expenses.

In 2003, the University of Southampton prepared a directory of journal policies for author self-archiving (<http://romeo.eprints.org/publisher.html>). It lists publishers and their journals and indicates which journals have and have not given their green light to author self-archiving. Three policies are mentioned: PALE-GREEN (pre-print permission), GREEN (post-print permission), and GRAY (no permission). Most of the major scientific periodical publishers that cover nearly all the key journals incorporated in the databases of the US Institute for Scientific Information, including the Russian Interperiodika publishing house, have adopted the first two self-archiving policies.

When presenting support mechanisms and strategies for open access during the signing of the Berlin Declaration, Stevan Harnad proposed two strategies for the dissemination of research results:

(1) Green Strategy. Researchers place their article manuscripts in traditional scientific journals (23500 journals have electronic versions), in respect for which their publishers apply the above-mentioned self-archiving policies, and then place published (or accepted for publication) articles in institutional electronic OA archives.

(2) Gold Strategy. Researchers place their article manuscripts in online scientific journals (500 journals) and after they have been published, in OA archives.

In his recent address at the BOAI (Budapest Open Access Initiative) Internet forum, Stevan Harnad urged scholars to be vigilant, as some publishers may manipulate the green- and gold-strategy notions and demand that authors should pay for green OA, which is absurd. As an example, he mentioned the “American Chemical Society’s cynical, self-serving ‘Author Choice’ Option.”

In response to the publishers’ demands, the scientific community began launching alternative scientific communications, as was mentioned previously. A pioneer OA archive set up in 1991 by researchers in high-energy physics (arXiv.org) became a demonstrative example of such self-organization of scientists and gave rise to an international movement for open access to scientific and scholarly knowledge, as well as the above-mentioned Public Library of Science, which was set up in 2003 at the initiative and with the active support of Nobel Prize winner Harold Varmus, former director of the US National Institute of Health, in response to publishers’ refusal to open their journal archives. This initiative drew the attention of 34000 experts from 180 countries, and now PLoS has its own open-access online journals in the fields of biology, medicine, genetics, and bioinformatics.

There is an understanding inside the OA movement that today one witnesses a historic rapid competition that should demonstrate which countries will lead in putting these recommendations into practice. The post-Soviet countries are not at the forefront: Russia has four institu-

tional OA archives, while Ukraine has just one and, what is more, this one nonfunctioning. However, in the near future the situation in Russia will change for the better, owing to the recent addition to the movement of the 21st institute of the Social Science Department of the RAS (<http://socionet.ru/publication.xml?h=repec:rasm-qijxk:12>), and the process of registration of their OA archives in the worldwide open-access repository register has started. This is now the second year that the Social Science Department of the Russian Academy of Sciences (RAS SSD) has been implementing their Open Access to Research Results program. According to information received from S.I. Parinov, Dr. Sci. (Tech.), the chief designer of the program, a thorough organizational mechanism has been launched:

- Researchers are obliged to put their research results in the OA archives of their institutions;
- Materials deposited in these archives are collected in Socionet (this network is the first Russian OA archive registered in the worldwide register of such archives), where links may be provided;
- Socionet compiles citation statistics for these materials and studies their impact on other research activities based on the above-mentioned links;
- Citation indices and impact factors are used by RAS SSD institutes for grading and assigning personal scholarly premiums to researchers, thus encouraging them to deposit their findings in their institutional OA archives.

The Russian university community has not yet worked out such a mechanism. Having signed the Berlin Declaration and the Budapest Open Access Initiative and having joined the European Commission’s SINAPSE online platform, Belgorod State University claims leadership in the OA movement in the post-Soviet university community. We have prepared a draft Belgorod Declaration for Open Access to Scientific and Scholarly Knowledge and a respective draft Action Plan that are supposed to be adopted in the Belarusian–Russian–Ukrainian near-border university area as part of the activities of the cognominal consortium.

Within the framework of the international movement for open access to scientific and scholarly knowledge, a process of phased transition from the conventional system of research communications to a hybrid one is occurring, in which the role of the online component is progressively growing. It should be noted that in electronic research journals, as in traditional ones, great attention is paid to the procedure of scientific review, by which the entire scientific paradigm has been held in place since the middle of the 17th century.

At the same time, the Internet offers an opportunity to make the results of scientific publications available without any regulation, based on the procedures of scientific review and approval of findings by the editorial staff of a journal. This will have revolutionary effects in the nearest future.

Ingenious researchers who are aware of the new vistas opened to them become absolutely free of any pressure or regulation on the part of employers, publishers, journal editorial staff, and reviewers. They have a right to publish their work on the Internet and receive instantaneous recognition without haunting the thresholds of book and journal publishing houses, as was the case not too many years ago. If previously it was frequently impossible to publish offbeat scholarly works, which did not fit within the existing scientific paradigms or theories and encountered resistance from existing scientific schools and groups, now, thanks to the internetization of science, such barriers have been completely removed. One vivid example is the publishing of a non-reviewed paper proving Poincaré's theorem in the preprint AO archive of the Los Alamos National Laboratory by the Russian mathematician Grigorii Perel'man,

who rejected the traditional methods for achieving recognition for his findings. As a result, on August 22, 2006, he received the top award for mathematics—the Fields Medal.

Apropos of this, Academician V.N. Strakhov recently noted that “Science in the early 21st century is the destruction of the existing mentality and stereotypes plus the sitization of all research” (<http://rfbr.uipe.ru/pdf/1-01o.pdf>).

Consequently, we may conclude that the role of intellectuals in the globalization epoch, notwithstanding its unifying and leveling nature in respect to creative and educational activities, is increasing more than ever. Today, they may become independent “globalized players,” exerting influence on worldwide processes in the intellectual sphere, and to this end they need nothing except a computer and the Internet.