ՋԱՆԳՎԱԾԱՅԻՆ ԼՐԱՏՎՈՒԹՅԱՆ ՄԻՋՈՑՆԵՐԻ ՏԵՍՈՒԹՅՈՒՆ
MEDIA THEORY

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SCIENCE IN THE NEW MEDIA ERA

Key words: New media, science communication, digital platforms, science journals, science popularization, science databases, social media.

Introduction

Scientific communication in the "pre-digital age" can be characterized in several features. First, it is conservatism, that is, new skepticism to knowledge. On the one hand, it can have a positive effect, because in that way unverified data cannot penetrate science. On the other hand, it can lead to negative consequences, because in some cases it hinders the development of new knowledge. Thirdly, a very low level of interactivity, i.e. two-way communication, can be noted. In the past, scientists could only conduct large-scale discussions answering in a debate format in a conference or scientific journal to the published publication. This has often

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resulted in the debate being drawn out for a long time and it was not effective either. A scientist went through a lot to get into a scientific environment, had to have a status, such as a PhD student, in order to go through the stages of scholarly communication. It is also characteristic of modern science communication, but in this case a certain democratization takes place. Eventually, in the analog era, scientific communication had a one-way character. That was also due to a low level of interactivity, i.e. due to the impossible two-way established communication and shortage of the scientific community with the impossibility of receiving a response in time.

For a long time, scientific publishing houses have been established in the field of scientific communication monopoly. Among the largest publishers are Sage Publishing, Taylor and Francis, as well as the Dutch publisher Elsevier. Those 3 big publishers signed an agreement in the 1990s, which was named the Big Deal. Under that arrangement, the publishers decided that access to scientific journals will become paid for universities and libraries. As a result, this led to a monopolization of science communication, which caused a big debate among scientists. The latter were dissatisfied with that move and as a result of those discussions, they admitted that such an agreement would negatively affect science communication. Some scientists have had to access their articles to buy them. It was obvious to the representatives of the scientific community that the publishing houses, scientists earn large sums of money as a result of their research. Universities and libraries cannot purchase access to a single publication. As a rule, they are to gain access to the entire database. But this model of monopoly is destroyed by open access journals. It should be noted that the scientific field is slow to respond to the changes that have arisen as a result of the development of new media. That is due to the conservative thinking of scientists and scientific communication with many other features.

Scientific Communication in the Digital Age

Let's analyze how scientific communication has changed in the digital age. First, the democratization of communication has taken place and the threshold of entry has decreased. It means, that scientific debates can now involve a variety of people, not just the very senior scientists, but also those who are just starting their way to science. Second, you can talk about multi-platform. In the modern world scientific data is available on not one but on many platforms. Many scientific journals are

published in two versions: print and digital. In addition, there are social networks for scientists and others aggregators, which can also be considered a separate platform for scientific research distribution. Third, we can talk about data visualization. The scientists try to present their complex ideas and concepts more clearly so that they become available to a wider audience. For the current period interactivity is typical. As the interaction of scientists in a scientific environment got simplified, different layers of society did as well. If previously researchers used to avoid communicating with a non-specialist audience, now the scientific community has become more open. The range of opportunities available to scientists for their research is expanding, making it available to the general public interested in the basic sciences, with new scientific discoveries.

In the field of scientific communication, new phenomena can be considered social networks for scientists. Due to open access to various fields, researchers can exchange data, discuss current research directions, articles, as well as share useful links. Many e-scientific journals have been created, which can exist on the basis of both large publishing houses and on the individual universities. Their feature is that they are open to the public for different layers, that is, whoever has access to the Internet, he can use scientific journals. To read this or that article on the website of such a journal there is no need to subscribe and pay the publisher.

One of the social platforms for academics is **academia.edu**[1]**.** which is considered the largest social network for scientists. More than 240 million users were enrolled in December 2023. It's free to sign up, but some features are available only to users who have subscribed to a paid subscription. Scientists from different fields of science unite on this platform. There is an opportunity to search users interested in similar topics, can connect with different scholars' pages, follow their updates, upload published works as well as publish works that have not yet been published anywhere: drafts (draft-manuscript or the first version of any other document). For example, a researcher, before a major project launch, can describe future developments and provide feedback to partners. This phenomenon is observed mainly among those engaged in media research.

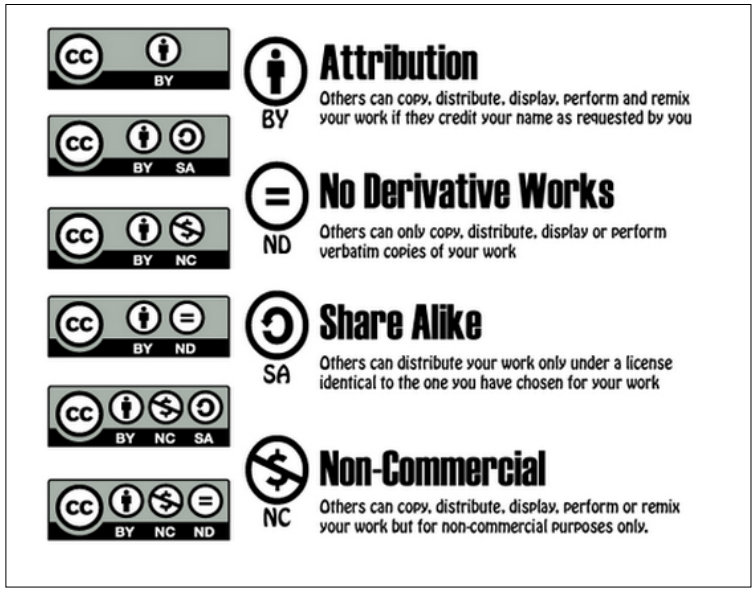
There is another site for scholars, **Research Gate**[2], the main competitor of academia.edu. Fewer users are registered there (as of September 2023, 25 million users). As in the first case, the website is intended for scientists from different

[1] www.academia.edu

[2] www.resarchgate.net

fields, there is no specialization. **Research Gate** is partially accessible. However, in order to get full functionality, one must be registered with a corporate email address. Therefore, if a lecturer does not have a corporate email, he may not have access to all of the resources that are posted on that site. The platform is created in much the same way as academia.edu. There you can publish the works that already were published. One can also share their developments with other scientists and challenge them to participate in the discussion.

In scholarly communication, with the introduction of new media, the open-access journals are a unique phenomenon, like it was introduced above. Those journals and the model are confronting publishing monopolies and largely disrupting newsrooms businesses, that still occupy leading positions in the market and operate with the old economy models. All materials published in an open access journal are distributed with a Creative commons license (open license). When the author signs a contract with the publisher, he gives the journal the right to distribute his publication under an open license. It can also be known that an open access publication does not make a journal open access automatically for the participants.



Picture 1 shows the different types of creative commons license. There are quite a few, but the most versatile type is the public domain, i.e. the works that have become public properties; in this case there is no need to credit the author. In other cases, the author of the work should be mentioned, but depending on the

type of the patent, whether it is allowed or not to change the source material, the license should be given.

The most common license is listed as CC BY (Creative commons attribution). That means that the author must be credited, and that is the only condition for distribution. If we see CC BY SA mention, then it means that such content can be distributed and modified. =: symbol means that such work may not be used for commercial purposes. Image combinations may vary. It is important to pay attention to it depending on the license under which the article is distributed[3].

There are different models within which open access journals operate. "The Golden Model" implies that the publisher makes publications immediately available on the journal's website. In the case of the "Green Model", the author himself can archive his article on his own website: on the website of the organization that provided funding for conducting the research, as well as in the independent repository domain. Within the hybrid model, there are publications that are closed for general use, but there are also open publications, which are distributed under a Creative Commons License. Speaking about the platinum/diamond model, it does not involve payment either by the readers or by the author who publishes this or that article. However, for such journals to survive, some are sponsored by organizations, for example, from educational institutions or grants are provided by state institutions. This model is always marked specifically under a creative commons license. Not only is it stated that the publication is available, but also the specific type of patent. "Bronze model" assumes that articles are available on the publisher's website, but there is not always a clear indication of the type of license. There is a "black model" of open access journals as well. This means that the authors publish their articles, monographs and textbooks in open access, though the fact that they signed a contract with the publishing house, and according to that contract, no one can distribute the work in open access[4], that is, it arises violation of agreements. We often witness such situations on **Research Gate** and **Academia.edu**[5] websites. There are publications that are initially in closed access, but the authors understand that many scientists cannot buy a subscription to this or that publication, post their works to provide access to a wide range of scholars to familiarize them with those materials.

[3] https://www.fullerton.edu/openfullerton/of_learn/creative_commons.php

[4] **Trishchenko** 2019, 73–83. https://doi.org/10.3103/S0147688219020059.

[5] https://independent.academia.edu/AstghikAvetisyan

New players have appeared in the market of modern scientific communication. Those are international databases that index logs. In the scientific field the most authoritative databases are **Scopus and Web of Science**, which accumulate journals in various fields and directions of science. Also there is a citation ranking within those databases. The most cited and authoritative journals with a high impact factor get in 1–2 quartiles, and citations with a lower level go to 3-4 quartiles. There are also journals that are not part of the so-called core collection, that is, journals in the main list. There are publications in Armenia that are indexed in **Web of by Science and Scopus**. They are issued exclusively in English, and to appear in the databases, it is necessary to meet certain conditions and set standards.

World Scientific Repositories and Scientometrics

Repositories are another new data storage format in the scientific environment which appeared due to the development of new media**.** They are digital platforms where the materials sent before printing are published (Preprints). Any a scientific paper can be published there without referring to scientific publications. In some universities it is considered a full publication. Some platforms like those are F1000Research and arXiv.org. The latter is the most popular digital repository of scientific information. The data of scientists from various fields (biology, chemistry, physics, etc.) are placed there. There is pre-moderation, but it is applied in an incomplete review, i.e. it cannot be said that the publications go through the review procedure in their entirety.

There are also mega-journals that publish thematic articles in several points of view. There are open review platforms where publications with at least two positive reviews on it, can be considered as published. A reviewer can be of any platform participant: One of the mega-journals is the **PLoS one** project, which is deciphered as Public library of science. The project was created in 2000 by virologist Harold Varmus after his speech. A famous Nobel laureate suggested that an online platform can be created where scientists can freely share their publications.

The journal covers a wide range of disciplines. Studies of scientists from different fields are published there. In 2010, the journal was incorporated in the **Journal Citation Report** database. Now it has an extremely high impact factor, which consists of 4,411 points. The 2023 release of Journal Citation Reports extends the Journal Impact Factor (JIF) to all Web of Science Core Collection™ journals, including those indexed in the Arts and Humanities Citation IndexTM (AHCI) and the

multidisciplinary Emerging Sources Citation IndexTM (ESCI). Expanding the JIF to all Web of Science Core Collection journals means that over 9,000 journals, from more than 3,000 publishers – many of which are smaller publishers from the developing world – are included for the first time. The following downloadable file contains a list of the 9,136 journals that have a JIF for the first time this year[6].

In the field of mass communication and journalism, there are open access journals, however, they are not so many. Among them, we can distinguish: **Social media + Society, Digital Journalism** as well as **Cyberpsychology**. **Social Media and Society** is owned by **Sega** publishing house. It is the first journal that specializes in social platforms with studies of the impact of a large public audience. You need to pay to be published in the journal. The author pays only if the article was reviewed and accepted for publication. **Digital Journalism** journal is published on another platform by **Taylor and Francis** publishing house. Third mentioned journal **Cyberpsychology** is from the field of mass media and communication science. It is published at the university and is not part of a major publishing house.

Several other projects are related to the open access movement. For example, DOAJ which is the directory of open access journals.[7] The project started in 2003 is an online platform where all journals distributed in principle of open access are accounted. The idea of creating such a platform arose in 2007 at a scientific conference, and a year later, Lunda University in Sweden initiated the start. In the register you can now find all the journals in different fields of science which are distributed according to this principle. A second resource, also related to the open access movement, is called **Unpaywall**. It allows you to find the legal copy of this or that scientific work, which is originally closed. You can enter the name of this or that article in the search bar, and the system searches whether this work was published on the university website or by the author himself on his personal website in the public domain. It's a totally legit resource that does not violate anyone's copyright.

With the development of new media in scientific communication, new online formats have also emerged. These include short videos of lectures by scientists who tell about the results of their research. For example, **Saggy** publishing released a

[6] https://clarivate.com/first-time-journal-citation-reports-inclusion-list-2023/ Journal Citation Reports™ (JCR™) provides publisher-neutral journal intelligence through a rich array of transparent data and metrics, including the Journal Impact Factor™ (JIF™)

[7] **Tishenko** 2019. No. 1/13. DOI: 10.15847/jobs13120191422.

project called **Sage video**. It exists on the publisher's website, where one can find quite a few lectures by scholars telling the story about the research and share the results. Unfortunately, a very small part of the videos available because the publisher has a paid subscription.

The format of video lectures also exists in Armenia, but they resort to it mainly those who popularize science, as well as popular science media, which speaks in an accessible language about achievements in the field of science. The number of content videos increased during the pandemic period because the lectures began to record and publicize. Unfortunately, the Armenian scientific community is still quite conservative. Consequently, scholars rarely resort to the video format[8].

Influenced by digital and new media, new approaches have emerged in scientific communication metric systems. Scientific measurement is used to measure the effectiveness of scientific activity. Traditional scientometric systems are related to impact factor, citation index, the Hirsch index. One alternative scientometric model is **Altmetrics**. This system takes into account not only scientific journals, but also social networks quotes[9]. This system is not yet widely used, but we can see that on the websites of major publishers, including those that publish journals on communication and journalism, that metric is taken into account. When talking about changes in the field of scientific communication under the influence of new media it is worth mentioning the **sci-hub** project. This platform was created by the St. Petersburg State University student Alexandra Elbakyan. The platform provides access even in research publications on closed platforms. Having a **DOI**, i.e. the **digital object ID**, one can access the pdf version of the publication even if it is closed to the public. To do this, you need to copy the **DOI**, paste it into the search field. In this way, a large number of publications have become available on the Internet. Of course this site is not very legal because it violates the publishing monopoly, and many publishers are outraged by the existence of such a project. The site is regularly blocked but the creator of the project took the initiative to create mirror versions of the site.

[8] Avetisyan A. Sh., Armenian PR association, https://www.armpr.org/prlibrary, 2022.

[9] Antell K., Foote J. S., & Foote J. B. Scholarly Publishing 's Evolving Landscape: Impact Metrics, Electronic-Only Journals, and Open Access in Journalism and Communication Research // Journalism & Mass Communication Educator. 2016. No. 71. (3). P. 309-328. URL: https://dadorg/10.1177/1077695816668864.

Recently, digital data of scientific databases have gained wide recognition. They are platforms, where different publications can be found by keywords or full title of the article. One such database is **Google Scholar**. This is the biggest platform in the world, with the help of which you can search for any monograph and article.

It is also necessary to discuss the negative aspects of scientific digital communication. One of the problems is that many scholars are skeptical of the journals that exist online only, no printed version. Scientific community representatives often succumb to the stereotype that online journal publications are of lower quality than in print journals. There is a conflict being waged against these twisted ideas to this day. Second, there are copyright issues related difficulties. Not all publications follow open access model, do not clearly regulate copyright issues. Which creates certain legal problems. In addition, it also causes problems when some authors, signing a contract with a publishing house, publish their researches open access as well. On one hand, for scientific communication it is good because a wider range of scholars get a chance to read the work. But it also causes a backlash from publishers whose business is disrupted in this way: This phenomenon is perceived as the resistance of publishers to new distribution models of scientific knowledge. Such publishers as: **Elsevier, Sage, Taylor and Francis**, do not always welcome new forms of scholarly communication because it threatens their existence. However, such changes are inevitable, and publishers will have to adapt to these transformations.

Conclusion

Science communication has undergone significant changes in the new media era. The boundaries between science and society are blurring, and digitalization is transforming the public sphere. The introduction of new media has transformed science communication from a relatively linear process of gatekeeping, publishing, directed-search, and retrieval to a multi-stakeholder socialized digital sphere of interactivity, discussion, and recommendation. In conclusion, the new media era has brought about significant changes in the way science is communicated to the public. The impact of these changes is still being studied, and it is important to continue to explore the best ways to communicate science to the public in this new era.

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https://clarivate.com/first-time-journal-citation-reports-inclusion-list-2023/ Journal Citation Reports™ (JCR™) provides publisher-neutral journal intelligence through a rich array of transparent data and metrics, including the Journal Impact Factor™ (JIF™)

ԳԻՏՈՒԹՅՈՒՆԸ ՆՈՐ ՄԵԴԻԱՅԻ ԴԱՐԱՇՐՋԱՆՈՒՄ

ԱՎԵՏԻՍՅԱՆ Ա.

Ամփոփում

Բանալի բառեր՝ Նոր մեդիա, գիտական հաղորդակցություն, թվային հարթակներ, գիտական ամսագրեր, գիտության հանրայնացում, գիտական տվյալների բազա, սոցիալական մեդիա:

Գիտական հաղորդակցությունը, նոր մեդիայի ի հայտ գալով փոխակերպվել է: Այսօր գիտական հետազոտություններն առավել հասանելի են: Ստեղծվել են գիտական հոդվածների, հետազոտությունների տարատեսակ հարթակներ, որոնք հնարավորություն են ընձեռել ձևավորել թվային նոր ձևաչափեր: Բաց հասանելիության (open access) շնորհիվ տարբեր ոլորտների հետազոտողներ կարող են փոխանակել տվյալներ, քննարկել արդիական հետազոտական ուղղություններ, հոդվածներ, ինչպես նաև կիսվել օգտակար հղումներով: Ստեղծվել են բազմաթիվ էլեկտրոնային գիտական ամսագրեր, որոնք կարող են գոյություն ունենալ ինչպես խոշոր հրատարակչությունների,

այնպես էլ առանձին համալսարանների հիմքի վրա: Դրանց առանձնահատկությունն այն է, որ բաց են հանրության տարբեր շերտերի համար, այսինքն՝ ով ունի հասանելիություն դեպի համացանց, նա կարողանում է օգտվել գիտական ամսագրերից և գրականությունից:

НАУКА В ЭРУ НОВЫХ МЕДИА

АВЕТИСЯН А.

Резюме

Ключевые слова: новые медиа, научная коммуникация, цифровые платформы, научные журналы, популяризация науки, научная база данных, социальные медиа.

Научная коммуникация была преобразована появлением новых медиа. На сегодняшний день созданы различные платформы для научных исследований, которые дают возможность создавать новые цифровые форматы. Благодаря открытому доступу исследователи из разных областей науки могут обмениваться данными, обсуждать актуальные направления исследований, делиться полезными ссылками. Создано множество электронных научных журналов, которые могут существовать как на базе крупных издательств, так и отдельных университетов. Их особенность заключается в том, что они открыты для общественности, то есть литературой из научных журналов может пользоваться любой, кто имеет доступ к Интернету.