

Шмаровоз Олена Василівна, студентка кафедри економіки і торгівлі, shmarovozolena2002@gmail.com, <https://orcid.org/0009-0006-9381-4442>

Волинський національний університет імені Лесі Українки
43025, Волинська область, м. Луцьк, просп. Волі, 13

Павлова Олена Миколаївна, доктор економічних наук, професор, завідувач кафедри економіки і торгівлі, pavlova.olena@vnu.edu.ua, <https://orcid.org/0000-0003-2583-9593>

Волинський національний університет імені Лесі Українки
43025, Волинська область, м. Луцьк, просп. Волі, 13

Ляшенко Оксана Миколаївна, доктор економічних наук, професор, професор кафедри економіки і торгівлі, liashenko.oksana@vnu.edu.ua, <https://orcid.org/0000-0001-5489-815X>

Волинський національний університет імені Лесі Українки
43025, Волинська область, м. Луцьк, просп. Волі, 13

Матійчук Любомир Павлович, доктор економічних наук, доцент, професор кафедри комп'ютерних наук, mlpstat@gmail.com, <https://orcid.org/0000-0001-6701-4683>

Тернопільський національний технічний університет імені Івана Пулюя,
46001, Тернопільська область, м. Тернопіль, вулиця Руська, 56

МЕТОДОЛОГІЯ ВІДКРИТОЇ ЕКОНОМІЧНОЇ НАУКИ ІНОЗЕМНОЮ МОВОЮ: ТЕОРІЯ ТА ПРАКТИКА

Вступ. У сучасних умовах, коли наукові дослідження відіграють вирішальну роль у подоланні глобальних викликів, відкритість і загальнодоступність наукових знань стають основоположними принципами для успішного розвитку суспільства. Концепція відкритої науки, яка сприяє вільному обміну науковою інформацією, забезпеченню доступу до результатів досліджень, даних та методологій, створює нові перспективи для співпраці, інновацій та покращення якості наукової роботи. Для України, яка прагне посилити свій науковий потенціал і інтегруватися в глобальний науковий простір, розвиток відкритої науки є не просто важливим, а обов'язковим кроком для підвищення її конкурентоспроможності на світовій арені.

Метою статті є ґрунтовне дослідження теоретичних та практичних аспектів дослідження методологічних засад відкритої економічної науки іноземною мовою.

Матеріали та методи. Методологія відкритої науки стала одним із провідних напрямів сучасних наукових досліджень, спрямованих на підвищення доступності, прозорості та результативності наукової діяльності. Відкрита наука передбачає безкоштовний обмін знаннями, публікацію результатів досліджень у відкритому доступі та тісну співпрацю науковців з різних країн. Ці принципи особливо актуальні для міжнародних досліджень, де мовні та культурні бар'єри можуть стати перешкодою для ефективної взаємодії та обміну знаннями.

Перспективи. У статті висвітлено важливість та особливості розвитку відкритої науки в Україні, зокрема щодо доступу до міжнародних наукових досліджень. Проаналізовано основні проблеми, такі як обмежене фінансування, мовні бар'єри та недостатній розвиток інфраструктури відкритих репозиторіїв. Доведено, що впровадження принципів відкритої науки сприятиме підвищенню якості досліджень, розвитку міжнародної співпраці та інновацій

в Україні. Особливо підкреслюється важливість доступу до іноземних досліджень для адаптації до світових наукових і технологічних тенденцій. У статті запропоновано можливі шляхи розвитку відкритої науки в Україні, включаючи вдосконалення законодавства, розвиток інфраструктури та підтримку міжнародних наукових ініціатив. Використання принципів відкритої науки дозволить Україні приєднатися до глобальних наукових процесів, покращити доступ до наукових знань, скоротити розрив між наукою та суспільством, а також стимулювати інноваційний розвиток. У статті розглянуто ключові аспекти значення відкритої науки для української наукової спільноти та національного розвитку, зокрема в контексті міжнародної співпраці, економічних перспектив і підвищення якості освіти.

Ключові слова: відкритий доступ, відкрита наука, наукові дослідження, іноземні дослідження, репозитарій.

Shmarovoz O., Student of the Department of Economics and Trade, shmarovozolena2002@gmail.com, <https://orcid.org/0009-0006-9381-4442>

Lesya Ukrainka Volyn National University

Pavlova O., Doctor of Economics, Professor, Head of the Department of Economics and Trade, pavlova.olena@vnu.edu.ua, <https://orcid.org/0000-0003-2583-9593>

Lesya Ukrainka Volyn National University

Lyashenko O., Doctor of Economics, Professor, Head of the Department of Economics and Trade, liashenko.oksana@vnu.edu.ua, <https://orcid.org/0000-0001-5489-815X>

Lesya Ukrainka Volyn National University

Matiichuk L., Doctor of Economics, Associate Professor, Professor of the Department of Computer Science, mlpstat@gmail.com, <https://orcid.org/0000-0001-6701-4683>

Ternopil National Technical University named after Ivan Pulyuy

METHODOLOGY OF OPEN ECONOMIC SCIENCE IN A FOREIGN LANGUAGE: THEORY AND PRACTICE

Abstract. *In today's world, where scientific research plays a crucial role in addressing global challenges, openness and accessibility of scientific knowledge have become fundamental principles for the successful development of society. The concept of open science, which promotes the free exchange of scientific information and access to research results, data, and methodologies, creates new opportunities for collaboration, innovation, and improving the quality of scientific work. For Ukraine, which aims to strengthen its scientific potential and integrate into the global scientific community, developing open science is an important step toward enhancing its competitiveness on the world stage. By embracing open science, Ukraine can tap into a wealth of international knowledge, foster collaboration, and accelerate its scientific progress.*

The purpose of the article is to provide a thorough study of the theoretical and practical aspects of researching the methodological foundations of open economic science in a foreign language.

Materials and Methods. *The methodology of open science has become one of the leading directions in modern scientific research, focused on increasing the accessibility, transparency, and effectiveness of scientific activities. Open science involves the free exchange of knowledge, publication of research results in open access, and close collaboration between scientists from different countries. These principles are particularly relevant for international research, where language barriers, such as the need for translation and interpretation, and cultural differences, which can affect the interpretation and application of research findings, can hinder effective interaction and knowledge exchange. However, international collaboration is also a key strength of open science, as it allows*

researchers to leverage each other's expertise and resources, and to address global challenges more effectively.

Prospects. *The article highlights the importance and specific features of the development of open science in Ukraine, particularly regarding access to international scientific research. The main issues, such as limited funding, language barriers, and underdeveloped infrastructure of open repositories, are analyzed. It is demonstrated that the implementation of open science principles will contribute to improving the quality of research, fostering international cooperation, and boosting innovation in Ukraine. The importance of access to foreign research for adapting to global scientific and technological trends is particularly emphasized. The article proposes possible paths for the development of open science in Ukraine, including the improvement of legislation, development of infrastructure, and support for international scientific initiatives such as joint research projects, exchange programs, and collaborative publications. Policymakers play a crucial role in these efforts, as they can enact legislation that promotes open science and allocate resources to support it. The adoption of open science principles will allow Ukraine to join global scientific processes, enhance the accessibility of scientific knowledge, bridge the gap between science and society, and stimulate innovative development. The article addresses the key aspects of the importance of open science for the Ukrainian scientific community and national development, especially in the context of international cooperation, economic opportunities, and improving the quality of education.*

Keywords: *open access, open science, scientific research, foreign research, repository.*

Statement of the problem. In today's world, where scientific research plays a crucial role in addressing global challenges, openness and accessibility of scientific knowledge are becoming fundamental principles for the effective development of society. Open science, which involves the free exchange of scientific information and Access to research results, data, and methodologies, creates new opportunities for collaboration, innovation, and improving the quality of scientific activity. For Ukraine, a country with a rich scientific history and growing scientific potential, developing open science is not just an important step but a prerequisite for achieving competitiveness on the global stage and making significant contributions to the international scientific community.

Open science methodology has become one of the critical areas of development of modern scientific research aimed at increasing the accessibility, transparency, and efficiency of scientific activities. Open science involves:

- The free exchange of knowledge
- The publication of research results in the public domain
- Interaction between scientists from different parts of the world

These principles are particularly relevant to foreign language research, where language barriers and cultural differences can challenge effective collaboration and knowledge exchange.

Applying the principles of open science will allow Ukraine to join global scientific processes, increase the accessibility of scientific knowledge, reduce the gap between science and society, and stimulate innovative development. Moreover, open science can significantly enhance the quality of education in Ukraine by providing students and educators Access to the latest research and fostering a culture of critical thinking and scientific inquiry. This article will discuss the importance of open science for the Ukrainian scientific community and national development in general in the context of international cooperation, economic opportunities, and improving the quality of education.

Foreign language research is an area where open science can significantly expand the possibilities of international scientific dialogue. Access to foreign-language sources, tools, and research results contributes to a deeper understanding of linguistic diversity and cultural peculiarities and opens up new perspectives for research.

Access to scientific information without restrictions is essential for developing scientific knowledge and disseminating scientific information. The global COVID-19 pandemic and the global health crisis have once again demonstrated the need for Access to and participation in scientific information for researchers worldwide, regardless of geography, language, gender, or other issues. This Access should help to reduce inequalities in Access to research, including data, infrastructure, and resources, between countries and regions, thereby fostering a more equitable and collaborative global scientific community. It should facilitate the rapid transfer of scientific knowledge and findings, open scientific understanding, and the publication of global scientific collaboration and data-driven decisions.

The purpose of the article is to provide a thorough study of the theoretical and practical aspects of researching the methodological foundations of open economic science in a foreign language.

Analysis of recent research and publications. The following scientists and scholars have studied the problem of open science: A. Vasylenko [2], I. Drach [4], V. Kopaneva [6], O. Chmyr [8], T. Kvasha [8], T. Yaroshenko [8], Y. Nosenko [9], A. Sukhikh [9], I. Regeylo [15], N. Bazeliuk [15], O. Berezko [1], K. Pavlov [13], O. Pavlova [13, 14, 19].

The main part. Today, the practices of open AccessAccess, open science, open data, and open source are more important than ever and are being developed and implemented worldwide. Open research data leads to more citations, increased academic impact for researchers and their institutions, and significant organizational collaboration and fundraising opportunities. Twenty years have passed since the announcement of the Budapest Open Access Initiative.

Open AccessAccess is a set of principles and practices that provide free, timely, permanent, full-text Access to scientific information for any user of the global information network [1].

A repository is an organized collection of digital documents and services surrounding this collection. It provides free and unhindered online Access to the results of scientific research (of individual researchers, institutions, or entire industries) and ensures their long-term survival and reliable storage [2].

According to the catalog of open access repositories, in 2022, there are about 6000 repositories in the world: subject repositories, institutional repositories, interdisciplinary repositories, and state repositories. Most often, repositories are associated with universities and other academic institutions, and their content is related to scientific and educational documents (articles, abstracts, theses, teaching materials, etc.).

Thus, today, the world's largest source of published materials is a combination of several disciplines, including postprints (4049), abstracts (3352), conference proceedings (2209), and other materials published in several disciplines. The repositories promote the OAI-PMH Open Archives Initiative Protocol for Metadata Harvesting. This protocol is compatible with different resources, and users can find

materials from these repositories without knowing the location, content, or age of these repositories [3].

The leading countries in terms of the number of depositories include the United States (914), Japan (681), and the United Kingdom (317). However, Ukraine also looks attractive in this list, with 106 registered repositories [3].

Open Science is a modern approach to organizing scientific activities based on transparency, accessibility, and sharing scientific knowledge. It aims to make scientific processes and results open and accessible to all stakeholders, including scientists, educators, the public, and politicians.

Open science has emerged as a response to the growing need for more transparent and inclusive science, where knowledge is disseminated quickly, and the scientific community works towards common goals to address global challenges. The European Commission coined the term 'open science' in 2014, and the EU's development philosophy has been based on the principles of open science since the early 2000s [7].

One fundamental principle of open science is free Access to scientific articles, publications, and monographs. Research results should be available to any user without financial or legal restrictions. Open Access allows scientists worldwide to have equal opportunities to access knowledge, which contributes to a more active dissemination of new ideas and research results.

Scientific data collected during research should also be made available for public use. This allows other scientists to verify research results, reproduce experiments, and use the data for further study. Open data increases the reliability and reproducibility of scientific results, which is an essential component of the development of modern science.

Another critical aspect of open science is the transparency of research methodology. Open science implies that all stages of research, tools, algorithms, and software used should be available to the public. This commitment to transparency not only ensures a high level of research transparency and facilitates reproducibility, but also fosters trust and credibility in the scientific community, enhancing the impact of your research.

As the largest funder of research in Europe, the European Commission implements many relevant policies and tasks within its Framework Programmes. The open-access pilot project under the Seventh Framework Programme (FP7, 2007-2013), launched in August 2008, has evolved into an open-access mission under the following research and innovation program, Horizon 2020 (2014-2020), which makes open-access publication of research results not only recommended but also mandatory. The famous Plan S also aims to implement the principles of open science and open data. The idea of Open Science is supported by other international institutions: UNESCO, IFLA, EIFL, SPARC, etc. [3].

In November 2021, the 41st session of the UNESCO General Conference adopted a recommendation on open science. This recommendation emphasizes the importance of this movement for global scientific cooperation, will promote equal Access to scientific assets, and will improve scientific and socio-economic benefits. The introduction of the open science paradigm is one of the main trends in the current development of the European research area.

Ukraine prioritized integration into the European research community for scientific development. As a result, several legislative initiatives have been adopted, and the National Action Plan for the Implementation of Open Science Principles until 2026 is being discussed [4].

It is worth noting that Ukraine's progress towards developing open science is manifested in some changes and initiatives. Here are the most important ones:

- Establishment of the National Grid of Ukraine (NGU) to implement specific European research projects (2009). Ukraine joined the European Grid Infrastructure Commission (EGI Commission) through UNG – an international electronics infrastructure aimed at providing advanced computing services and data analytics for research and innovation (2018);

- Approval of the 'Roadmap for Ukraine's Integration into the European Research Area (ERA-UA)' [5], which describes the priority areas for the development of open science and the goals and ways of their implementation. Directions, necessary tools, measures, and indicators for measuring results.

In 2021, the Ministry of Education and Science of Ukraine approved the National Roadmap for Open Science, which contains several strategic steps to implement open Access Access to scientific publications and data by 2025. This document was developed in cooperation with the European Commission within the framework of the project 'Support for the Implementation of Open Science in Ukraine,' funded by the Horizon 2020 program. The roadmap includes [5]:

- Implementation of national open access standards for academic institutions.
- creation of a single platform for scientific repositories.
- Develop recommendations for scientists on scientific data management and Open Access.
- development of a Strategy for the development of librarianship until 2025, which envisages the formation of the electronic library and information space of Ukraine, the creation of a single universal portal as a national, educational, scientific, cognitive, sectoral, and library information engineering, and information resource;
- national libraries provide AccessAccess to scientific resources (articles, journals, abstracts, etc.);
- attracting state funding to connect more than 100 domestic educational and research institutions to the international bibliographic and reference databases Scopus and Web of Science;
- changes to the requirements for domestic scientific publications, assigning an international digital identifier – DOI (Digital Object Identifier) to each published material [5].

As a result of these measures, Ukraine is expected to gain many benefits: the ability to provide reliable digital services to all types of users (not only scientists), more opportunities for cooperation between scientists and businesses through joint efforts, a resource dedicated to Ukraine's participation in the European Open Science Cloud (EOSC), and the potential for a pilot project to establish a national EOSC center in Ukraine.

One of the essential achievements is the creation of institutional repositories for open Access to scientific publications. As of 2023, more than 140 scientific institutions

in Ukraine have their institutional repositories, including the most prominent universities, such as the Taras Shevchenko National University of Kyiv, National Technical University of Ukraine 'KPI,' Ivan Franko National University of Lviv, and others [5].

At the moment, university repositories are the largest in terms of volume and popularity (fig. 1):

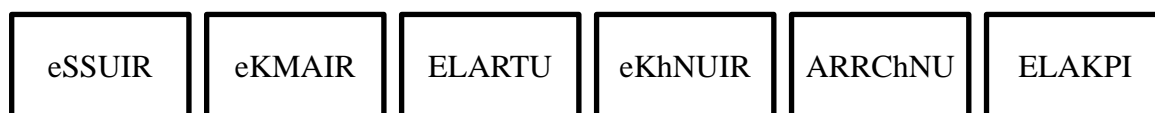


Figure 1 – The most popular depositories in Ukraine
Source: [5]

- eSSUIR – electronic archive of Sumy State University;
- eKMAIR – electronic archive of the National University of Kyiv-Mohyla Academy;
- ELARTU – archive of electronic materials of Ivan Puluj Ternopil State Technical University;
- eKhNUIR – electronic archive of V. N. Karazin Kharkiv National University;
- ARRChNU – institutional repository of Yuriy Fedkovych Chernivtsi National University;
- ¾ ELAKPI – electronic files of the National Technical University of Ukraine ‘Igor Sikorsky Kyiv Polytechnic Institute’, etc. [5].

However, a single national platform for the collection and dissemination of scientific data and publications is still under development. Currently, work is underway to create a National Repository of Academic Texts under the auspices of the Ministry of Education and Science of Ukraine. This initiative aims to provide centralised access to dissertations, articles and research reports from all over the country [8].

In 2016, the Cabinet of Ministers of Ukraine issued Resolution No. 504 of 22 July 2016 approving the establishment of the National Repository of Academic Texts (NRAT - <https://nrat.ukrintei.ua/>), which describes the basic concepts, structure,

sequence of its creation and operation, and approved its regulations. It is expected that the NRAT will serve as a nationwide electronic database that accumulates, stores and systematises educational texts [8].

The purpose of the NRAT is to provide the widest possible access to scientific information from Ukraine and the world, which will contribute to the development of educational, scientific, technological and creative endeavours by improving access to academic texts and promoting their academic integrity. The national repository consists of a central repository maintained by the national repository administrator and local repositories maintained by institutional participants. The database is now operational. As of November 2021, the database contains 162,200 research reports (including 107,300 full-text reports) and 162,400 dissertation metadata. NRAT degrees (of which 107,900 articles with abstracts are available in full text) [8].

Also, usage statistics show an increase in the popularity of the resource (an average of 2171 requests per day). We intend that the NRAT will continue to increase its capabilities and become a single source of national scientific information. The NRAT will also have a significant analytical role, especially in relation to the dynamics of publishing activities and the development of scientific, educational, innovation activities and relevant infrastructure, analyses the national scientific landscape, conducts scientific evaluation of publications of individuals, institutions and topics, and conducts bibliometric and scientometric analysis of the topic. Filling the repository with documents and works of students not only provides prompt access but also promotes academic integrity [7].

Ukraine is an active participant in international research programmes, in particular the Horizon Europe programme, which provides for open access to scientific results as a mandatory requirement. Since 2021, Ukraine has become an associate member of Horizon Europe, which allows Ukrainian researchers to participate in joint projects with EU scientists. As of 2023, Ukrainian institutions have participated in more than 90 Horizon 2020 and Horizon Europe projects, including in the fields of IT, biomedicine, and environmental research [18].

The openness of foreign research in Ukraine is an important component of the country's integration into the global scientific community and raising the level of Ukrainian science. Foreign research is made available in Ukraine through various channels, such as participation in international projects, academic mobility programmes, open publications by foreign scientists, and cooperation with foreign universities and research institutions.

Ukraine is actively involved in international research programmes, such as Horizon Europe, which is one of the largest European research funding programmes. Participation in this programme provides for open access to scientific results, which allows Ukrainian scientists to use the data and results of foreign colleagues. For example, in 2021, the National University of Life and Environmental Sciences of Ukraine received funding under the Horizon Europe programme for research in the field of ecology and climate change. This project includes cooperation with several European universities, and its results will be published in the public domain [18].

Ukrainian research institutions actively cooperate with foreign universities and research centres, which helps to open up foreign research to the Ukrainian audience. For example, the Institute of Physics of the National Academy of Sciences of Ukraine, in cooperation with institutes in Germany and Poland, is involved in research on quantum optics and nanophysics. This cooperation involves data exchange, access to new techniques and technologies, and joint publications in open international journals such as Nature and Science [9].

Open access to foreign scientific research is greatly facilitated by international scientific platforms such as arXiv, PubMed, and Zenodo, which publish scientific articles from various fields of knowledge. Ukrainian scientists can use these resources to access the latest research in biology, medicine, physics and other fields. For example, researchers at the Institute of Molecular Biology and Genetics of the National Academy of Sciences of Ukraine actively use the PubMed platform to access research results in genomics and bioinformatics [10].

Academic mobility programmes, such as Erasmus+, play an important role in opening up foreign research to Ukrainian students and scientists. These programmes

allow Ukrainian researchers to temporarily work in foreign academic institutions, participate in joint research, gain access to modern laboratory equipment and methods, and publish joint articles.

For example, students and researchers at the Ivan Franko National University of Lviv regularly participate in the Erasmus+ programme, where they collaborate with universities in Poland, Germany and France [15].

Another way to open up foreign research is to translate important works into Ukrainian. For example, Ukrainian scientific journals often publish review articles or translations of key works by foreign scholars. Universities also use translated textbooks and teaching materials to introduce students to the latest global achievements.

As an example, some leading scientific journals, such as the Ukrainian Scientific Journal of Medicine, periodically publish translations of foreign papers on topical topics in medicine and biotechnology.

The openness of foreign research in economics promotes global knowledge sharing, reduces information barriers and helps countries adapt to new economic challenges. This phenomenon significantly improves the quality of research and analysis and allows economists to use advanced ideas and tools from around the world.

Foreign research is often published in international peer-reviewed journals, such as The Quarterly Journal of Economics, American Economic Review, and Journal of Economic Perspectives. These journals are among the most cited sources in the world and actively contribute to the dissemination of new ideas among researchers and practitioners from different countries. For example, research in the field of behavioural economics conducted by Nobel laureates Richard Thaler and Daniel Kahneman is actively used in policy-making in the EU and the US [16].

European Union programmes such as Horizon Europe support scientific collaborations between researchers from different countries, particularly in the economic sphere. The openness of data and research results allows experts to share the results of their work and jointly seek solutions to global economic problems, such as climate change, economic inequality or digital transformation. For example, such

programmes conduct research on optimising tax policy to help governments adapt to the globalised economy.

International organisations, such as the World Bank, the International Monetary Fund (IMF) and the OECD, publish data, research and forecasts in the public domain. This allows economists around the world to use accurate, up-to-date information to analyse global economic trends and develop effective policy strategies. For example, IMF reports, such as the World Economic Outlook, help governments assess macroeconomic risks and potential scenarios for economic development [2].

The openness of research in the field of economics also contributes to the development of innovative economic models. For example, economic research in the digital economy and platform economy actively influences the development of development strategies at such tech giants as Google, Amazon, and Alibaba. The research of Mitchuk Kuchuk and Jean Tirole in the field of market platforms has become an important tool for understanding how to regulate digital markets [10].

One of the most illustrative examples of open research is the development of the concept of climate economies. Research papers, such as Nicholas Stern's study on the impact of climate change on the global economy, have been openly published and used in the development of environmental policies in many countries. They became the basis for the introduction of a green economy in developed countries and initiatives aimed at reducing the carbon footprint of global corporations.

Thus, the openness of foreign economic research not only facilitates the rapid dissemination of new knowledge, but also serves as a powerful tool for stimulating innovation and improving economic policy at the global level.

Despite positive trends in access to foreign research in Ukraine, there are a number of challenges that slow down this process. These include language barriers, insufficient funding, limited infrastructure for open access, and copyright issues for international publications.

One of the key challenges is the language aspect. The majority of high-quality scientific publications are in English, and many Ukrainian researchers face difficulties in accessing these materials due to insufficient English language skills. This applies

both to writing articles for publication in international journals and to understanding new scientific data.

To overcome this problem, some Ukrainian academic institutions offer language courses and support in preparing English-language articles. Also, various online platforms offering free or discounted translations of scientific articles are becoming popular, which helps to disseminate foreign research among the Ukrainian scientific community.

The lack of funding for science in Ukraine remains one of the main barriers to accessing foreign research. Many Ukrainian researchers cannot afford to publish in prestigious international journals, as publication fees can reach several thousand dollars.

This limits the ability of Ukrainian researchers to disseminate their work in the international scientific community, and also limits their access to relevant foreign publications, which are often paid for. However, there are projects and programmes that provide grant support for open access publications, which somewhat facilitates access to foreign resources for Ukrainian researchers.

The main challenge for the development of open science in Ukraine is the lack of funding for research. According to the State Statistics Service of Ukraine, in 2022, about 0.45 % of GDP was allocated for research and development, while the average for EU countries is over 2 %. The lack of adequate financial support makes it difficult to modernise research institutions and create the necessary digital infrastructure for open access. There is also the problem of paid publications in open access journals, which sometimes becomes burdensome for Ukrainian researchers due to the limited budgets of scientific institutions [4].

The openness of foreign research also depends on the existing infrastructure for open access to scientific publications. In Ukraine, the development of national repositories is still in its infancy. Despite the existence of resources such as the National Repository of Academic Texts, access to some foreign scientific journals or databases remains limited.

To improve the situation, it is important to expand access to international databases such as Scopus, Web of Science, and Elsevier, which offer a wide range of

scientific publications from around the world. Another important issue is copyright for international publications. Many foreign scientific journals impose strict restrictions on access to their publications, making them inaccessible to Ukrainian researchers without a subscription.

However, the development of the Open Access concept is helping to overcome this problem. Many academic institutions encourage open access publications, which allows researchers from any country to freely use research results. For example, the European Union has a Plan S initiative that requires the results of publicly funded research to be made available in the public domain [7].

Despite the existing problems, the prospects for openness of foreign research in Ukraine remain positive. The development of digital technologies, active international cooperation, and government support for open access are gradually opening up new opportunities for Ukrainian researchers. In particular, an important step will be the implementation of the National Open Science Roadmap, which provides for the creation of infrastructure for free access to scientific publications and data, as well as raising awareness of the benefits of open science among scientists.

Promising areas include:

- Expanding access to international databases. In cooperation with international partners, Ukraine can expand access to foreign scientific resources through preferential subscription programmes or participation in global open access projects. For example, the creation of pan-European initiatives such as OpenAIRE (Open Access Infrastructure for Research Results in Europe) can help Ukrainian researchers gain access to a large array of foreign publications.

- Open science funding programmes, such as Horizon Europe and other international grants, promote openness in research. Ukrainian researchers can participate in these programmes, which gives them the opportunity to publish their work in the open access and benefit from the results of colleagues from around the world.

- Deeper cooperation with foreign research institutions and universities, as well as the expansion of academic mobility programmes, create favourable conditions for the exchange of experience and access to modern research methods and results. In

particular, the Erasmus+ and Marie Skłodowska-Curie Actions programmes provide an opportunity for Ukrainian scientists to work temporarily in leading European research institutions and engage in cutting-edge research.

The openness of foreign research in Ukraine is an important element of the development of the scientific sector. Despite challenges related to funding, language barriers and infrastructure, Ukraine is gradually integrating into the global scientific community. Thanks to international programmes, grants, open access platforms and scientific exchanges, Ukrainian researchers are able to benefit from the results of foreign colleagues, which has a positive impact on the development of science in the country. To facilitate the accessibility of foreign research, it is important to develop the infrastructure of open repositories and databases. Ukraine already has some platforms in place, such as the National Repository of Academic Texts, but it is necessary to scale up these initiatives by combining them with international resources such as arXiv, PubMed Central, or OpenAIRE. This will allow Ukrainian scientists not only to access foreign research but also to disseminate their own research on the international stage [9].

The following recommendations are proposed for more effective development of open science in Ukraine (Fig. 2):

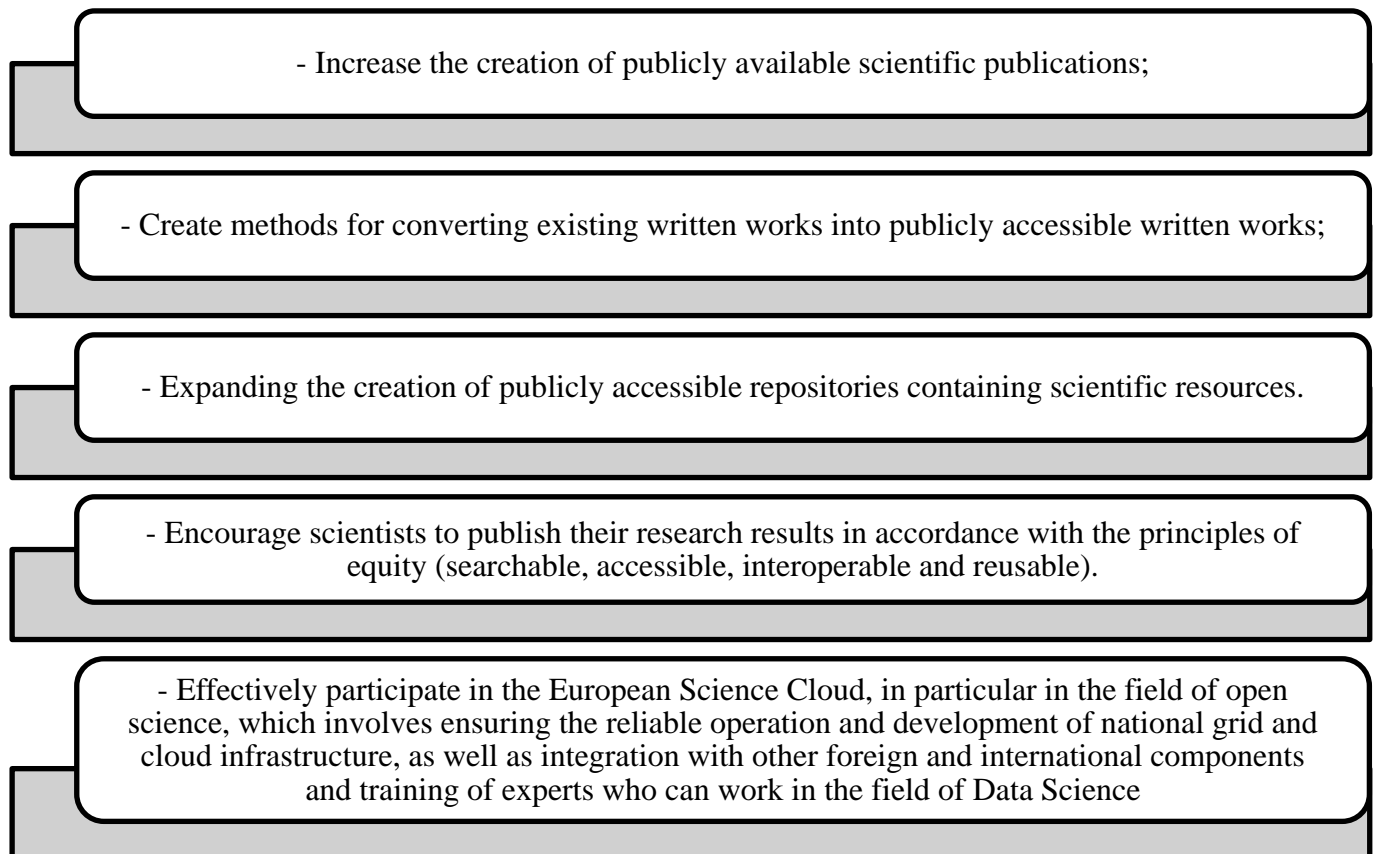


Figure 2 – Recommendations for more effective development of open science in Ukraine

Source: compiled by the author on the basis of [11].

As a result, the concept of open science is derived from a new approach to the scientific process based on collaboration and dissemination of scientific knowledge using digital technologies and methods. Currently, our country has implemented a number of initiatives and endeavours towards the development of open science. In the future, it would be advisable to consider the development of cloud-based open scientific system tools and technologies in global and Ukrainian education.

Conclusions. Open science is becoming a key tool for the development of the scientific sphere in Ukraine and integration into the global scientific community. Its principles, which provide free access to research results, data and knowledge, contribute to the expansion of international cooperation, improvement of the quality of scientific works and development of innovations. In the context of Ukraine, open science is not only an opportunity for progress, but also a necessity to overcome existing challenges,

such as insufficient funding, limited access to modern scientific resources and technologies, and language barriers.

Foreign scientific research plays a particularly important role in the process of modernising Ukrainian science. Access to international scientific developments allows for the use of advanced knowledge and technologies, and contributes to adaptation to global challenges such as climate change, digitalisation, and economic transformation. The openness of foreign research creates new opportunities for Ukrainian scientists, providing them with access to advanced methodologies and international research projects.

Despite the existing obstacles, Ukraine has great potential for the development of open science. Important steps in this direction include improving the legislative framework, creating a modern infrastructure of open repositories, engaging in international research programmes and projects, and promoting the principles of open science among scientists. The development of these areas will contribute not only to Ukraine's integration into the global scientific community, but also to the competitiveness of national science.

Thus, the openness of science, including access to foreign research, should become an important part of Ukraine's scientific development strategy. This will allow the country to expand its scientific capabilities, increase the number of scientific discoveries and promote innovative growth, which will have a positive impact on all spheres of public life.

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