THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

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Contribution of Academic Libraries to Advancing Open Data and Open Science: Importance, Advantages and Suggestions (Strategy and Priorities of Use)

Objective. The article is devoted to the study of the role of academic libraries in the advancing of the ecosystem of open science by foreign and domestic authors of the university community. **Methods.** The following general scientific methods were used in the research: generalization, analysis, and systematic approach. **Results.** The basis of the promotion of open science is open data and open access, which forms an Open Ecosystem of Scientific Research. This requires the transformation of academic libraries of Ukraine, in particular university libraries, with a change in qualification level of library specialists and technical personnel to assist in the development of resource and information innovations of libraries when using various PIDs (Persistent identifiers). **Conclusions.** For the scientific community of Ukraine, the Strategy of Open Science is being formed, the implementation and promotion of which will largely depend on the experience of specialists of academic libraries with the support of the State Scientific and Technical Library of Ukraine (SSTL of Ukraine). The Ministry of Education and Science of Ukraine (MES of Ukraine) prioritizes the use of international experience in promoting open data and open science, where academic libraries play a leading role.

Keywords: academic libraries; open data; open science; PIDs (Persistent Identifier); repositories

Introduction

The promotion of open data and open science in the academic international environment continues due to:

1) development of new documents, in particular: UNESCO Recommendations on Open Science (UNESCO, 2023, as cited in Priess-Buchheit, Hermeking, & Möbius, 2024), European Code of Conduct for Scientific Integrity (ALLEA, 2023, as cited in Priess-Buchheit, Hermeking, & Möbius, 2024), Agreements on the Reform of Scientific Research Evaluation (CoARA, 2022), Barcelona Declaration ("Barcelona Declaration", n.d.a), CoARA (CoARA, 2023), EUA Open Science Agenda 2025 (European University Association, n.d.),

2) initiatives of publishing platforms (F1000 (F1000Research, n.d.), OSF (OSF, n.d.), KUDOS (Kudos, n.d.), etc.) and publishing houses (in particular, SPRINGER (Springer Nature, n.d.), ELSEVIER (Elsevier, n.d.a), as well as

3) international projects, including "More than our rating" (INORMS, n.d.), PathOS Open Science Resources Hub (PathOS, n.d.), Handbook of Open Science Indicators (Open Science Indicator Handbook, n.d.).

Previous researches on the specified topic were related to: a) implementation of open science and public science, as its component (Mumelaš & Martek, 2024); b) open access in universities and different countries (Sastrón-Toledo, Alonso-Álvarez, & Mañana-Rodríguez, 2024; Shmagun et al., 2024; Vallejo-Sierra & Pirela-Morillo, 2024); c) problematic issues of open data, namely: 1) advantages and disadvantages of preprints (Ni & Waltman, 2024), 2) in the context of scientific communication: terminological and conceptual scenario (Pinto, 2024), 3) their placement in reliable repositories (on the example of institutional repositories of German universities (Taubert, Hobert, Jahn, Bruns, & Iravani, 2024), 4) places of transformational agreements with publishers (Schmal, 2024), 5) the use of open systems (as an example, LERRN –

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THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

a free database for resource reviews (Verma, 2024)) and the role of open systems that comply with the principles of FAIR (Azeroual, Schöpfel, Pölönen, & Nikiforova, 2022).

The purpose of the study is to show the contribution of academic libraries to the promotion (implementation) of open data and open science, to analyze the levers, advantages, and to provide suggestions, forming a strategy and priorities for use.

The authors (Mathieu d'Aquin, Fabian Kirstein, Daniela Oliveira, Sonja Schimmler, Sebastian Urbanek) considered the issue of expansion of the FAIR principles and added three additional principles that relate to the way, how the solutions should enable interaction, social connections and trust, forming the FAIREST principles (D'aquin, Kirstein, Oliveira, Schimmler, & Urbanek, 2023).

Other authors Priess-Buchheit, J., Hermeking, N. & Möbius, T. (2024) in their scientific article "Training to Act FAIR: A Pre-Post Study on Teaching FAIR Guiding Principles to (Future) Researchers in Higher Education" consider "effectiveness of FAIR training in higher education". They noted that their "study underscores the training potential in driving the transition towards open science actions in higher education and shows how much university legal frameworks can push toward such training. Students value FAIR training as very useful and satisfactory" (Priess-Buchheit, Hermeking, & Möbius, 2024).

Scientists considered impact of three ISO TC 37/SC 3 standards (mainly ISO 16642: 2017, ISO 12620: 2019 and ISO 30042: 2019) on the foundation of the FAIR terminology paradigm, and the integration of this data representation model in the framework of the European project "Terminology Without Borders" (TWB) launched in 2019 by the Terminology Coordination Unit (TermCoord) of the European Parliament (Vezzani, Di Nunzio, & Costa, 2023).

To aid information exchange between disciplines, the use of decimal latitude-longitude (dLL) topographic geo-referencing is advocated to identify locations of investigations, images and data in accord with the FAIR principles for data: findability, accessibility, interaction and reusability. W. B. Whalley emphasized that: "Inclusion of dLLs libraries into 'the literature' requires little extra work for authors and editors, and provides apparent advantages for readers (as they can locate and visualise data more easily), and especially for future workers. This approach, linking location to information on information surfaces, needs to be implemented by authors, developed and extended" (Whalley, 2023).

This topic is relevant in view of the further use of FAIR data as an emerging and improving open metadata system to promote open data and open science in the academic environment. This is evidenced by the following international studies.

Methods

In the process of working on this topic, the following theoretical general scientific research methods were chosen: generalization, analysis, and systematic approach.

The use of the generalization method made it possible to organize the information obtained from previous studies on open data and open science, and to further develop a strategy and priorities for its use.

Using the analysis as a method, we have identified the components that make up the subject basis of the study of this topic, namely: 1) expanding the basic principles of FAIR data as a basis for promoting open data and open science; 2) the need to educate the scientific community, which is formed from students; 3) the use of terminological standards for FAIR data; 4) the use of topographic geo-referencing of decimal latitude-longitude (dLL) format, etc.

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

The systematic approach allowed us to identify the levers, advantages, and proposals for FAIR data as an emerging and improving open metadata system in promoting open data and open science in the educational academic environment.

Results and Discussion

The Internet has broadened the communication of digitized journals and books among scholars and the perception that academic commercial publishers use copyright law to restrict the free circulation of scientific knowledge. Open access is changing the business model of academic publishing to the extent that copyright law is increasingly viewed as needing to be balanced against the right to benefit from science. Some people have called for copyright law to be revised to promote open access to academic publishing. The question of how copyright law should be revised to achieve this is more topical today than ever. However, there is a need to clarify and question the role that copyright law should play and there is much to be gained from consideration of the role that competition law can play. Additionally, initiatives to implement open access have been taken by stakeholders (scientists, publishers, universities, libraries, and research funding agencies) such as open access policies and the new "read and publish" agreements between publishers and universities' libraries. But the transition towards sustainable universal open access will be a long, complex process since the interaction between these stakeholders can lead to conflicts of interest (Esteve, 2024).

The Spanish authors in their study "Spanish Academic Libraries' Perceptions of Open Science. Drivers and Barriers" concluded that academic libraries may train researchers in OS through the acquisition of new skills and training of trainers, and with the strategic support of the university. They argue that academic stimuli and a change in research accreditation are also needed to shift researchers' perceptions regarding OS (Open Science) (Santos-Hermosa & Boté-Vericad, 2024).

PathOS (Open Science Impact Pathways) is a Horizon Europe project aiming to gather concrete evidence of the impacts of Open Science (OS) (Papadopoulou, & Grypari, 2024).

Close collaboration with librarians, researchers and institutions can enhance the dissemination and accessibility of scientific knowledge promoting open science (OpenAIRE, n.d.).

The principles promoted in the Barcelona Declaration on open research information also echo EUA's advocacy for a more holistic approach to openness in research and the commitment to develop responsible, inclusive, transparent and sustainable evaluation practices for research activities and careers (European University Association, 2024).

List of signatories of the Barcelona Declaration as of 15 April 2024, among which a number of organizations providing data, services and infrastructure, have declared their support of the Declaration. These include AmeliCA, Crossref, Curtin Open Knowledge Initiative (COKI), DataCite, EuropePMC, DOAB, DOAJ, Europe PMC, Liberate Science GmbH, OAPEN, OpenCitations, OpenAIRE, OurResearch, Redalyc and ROR as well as the State Scientific and Technical Library of Ukraine ("Barcelona Declaration", n.d.b).

The State Scientific and Technical Library of Ukraine (hereinafter, SSTL of Ukraine) carries out activities defined by the National Plan for Open Science (Cabinet of Ministers of Ukraine, 2022), advancing open data and open science (State Scientific and Technical Library of Ukraine, n.d.a) in the educational and scientific activities of Ukrainian higher education institutions, academic libraries as their structural units, and research institutions. A lot of work is being done to hold annual international online conferences "Open Science and Innovation in Ukraine", starting in 2022 (State Scientific and Technical Library of Ukraine, n.d.b).

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

This year, on September 23-24, 2024, the SSTL of Ukraine will participate in the Paris Conference on Open Scientific Information. Together with representatives from Austria, Italy and France, the SSTL of Ukraine will take part in a panel discussion and present Ukraine's contribution to the promotion of global open access initiatives. The report will emphasize the important role of the SSTL of Ukraine in promoting the development of open access to scientific information at the international level. The Paris Conference on Open Scientific Information promises to be an important platform for the exchange of experience and discussion of key issues related to open access to scientific data and information at the global level (State Scientific and Technical Library of Ukraine, n.d.c).

The three-year project Open4UA (November 2023 – October 2026) is the Erasmus+ "Open Science for Ukrainian Higher Education System", which aims to reform the higher education system by prioritising open science to advance the growth of Ukraine's knowledge-driven economy for the post-war recovery. Among the partners of the project is Yaroslav Mudryi National Law University (EIFL, n.d.).

The National Research Foundation of Ukraine, with the participation of MES of Ukraine, held an online event (April 30, 2024) to implement the National Plan for Open Science, in particular clause 5, which provides for the improvement of the system for assessing the quality of scientific and technical activities. This event contributed to the implementation of open science and open access in higher education institutions of Ukraine regarding the practical application of the main provisions of the Open4UA project on the topic "Seminar on the formation of a national consensus on open science" ("Seminar z formuvannia", 2024).

During the first seminar, the Open4UA team presented recommendations on reforms in the the sphere of Ukrainian science and education, developed by the project consortium based on the study of EU best practices. Besides, at the online event, a discussion of the new method of attestation of scientific institutions and institutions of higher education in terms of their scientific (scientific and technical) activities was proposed. The Open4UA team participated in the development of the methodology and wants to promote its effective discussion in the widest possible academic circles.

The seminar listed main indicators that will be used to evaluate the effectiveness of the scientific (scientific and technical) activity of scientific institutions and institutions of higher education, among which the following were innovative: the number of published preprints; the number of published dictionaries, directories, catalogs in public access; the number of published FAIR datasets that have a DOI.

Also, changes were made to the procedure for state certification of higher education institutions in terms of their scientific (scientific and technical) activities and the procedure for state certification of scientific institutions in pursuance of the National Action Plan for Open Science, namely clause 5, which provides for the improvement of the criteria for state certification of higher education institutions and scientific institutions. Pursuant to the order of MES of Ukraine dated April 10, 2024 No. 493 "On the results of the scientific, scientific and technical and innovative activities of institutions of higher education and scientific institutions belonging to the sphere of administration of the MES of Ukraine for the year 2023 and some previous periods" (Ministry of Education and Science of Ukraine, 2024a), the staff of the library and scientific research units prepared data on quantitative indicators for the first time, including in public access: 1) published articles in periodicals, including journals in Scopus and Web of Science; 2) published dictionaries, catalogs, reference books and encyclopedias; 3) published textbooks; 4) publications in conference proceedings, which are indexed in Scopus and Web of Science; 5) published FAIR data sets, which have DOI.

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

In the letter of MES of Ukraine dated May 3, 2024 No. 7/137-24 (Ministry of Education and Science of Ukraine, 2024b), clarifications were given regarding application of the concept of the "FAIR data sets" in Order No. 493, namely: "FAIR data means optimized research data that is stored in electronic form and complies with the principles of appropriate management of research data (FAIR principles). The principles of proper management of research data (FAIR principles) are principles that provide for the multiple use of research data, their availability, the ability to interact with various data types (inter-operability) and the implementation of a quick search for the necessary information". This clarification was an alternative step taken by this agency instead of the measures provided for in clause 6 of the National Action Plan for Open Science, namely: the program of the development of professional qualifications, and the introduction of trainings to raise the level and build competence in the principles of open science.

We note that: 1) the study has shown that academic librarians are moderately aware on OERs (Calilung, 2021); 2) innovative transformations of libraries of the higher education institutions is ongoing (Barabash, Hliebova, & Kolomiiets, 2023) and 3) the role of libraries, in particular university libraries, in the promotion of open science with a change in the qualification level of library specialists is increasing (Yaroshenko, 2021). At the same time, if possible, it is necessary to improve the technical and software of academic libraries (Kulyk, 2022) and use, temporarily, available tools for working with metadata (Kulyk, 2023), which involve the use of PIDs (Persistent identifier).

PIDs fulfill several FAIR principles, they are both persistent and actionable, and are the key to achieve the goals of networked science. Many types of PIDs have been developed, such as DOIs for objects and ORCID for individual researcher profiles, and the various types for both general and specific purposes are increasing (Matthew Mayernik, National Center for Atmospheric Research [NCAR]) (National Academies of Sciences, Engineering, and Medicine, 2024, p. 5).

The FAIR Data Principles originated in the life sciences, but are now gaining much expansion beyond. Within research communities, the generation of FAIR data is encouraged to maximize their value beyond a specific research question or project and to enable research at a larger scale and scope. As a consequence, your research impact and recognition as a researcher are enhanced.

This is why funders, publishers and politicians also encourage the generation of FAIR data. The FAIR Data Principles are central to the Horizon 2020 and Horizon Europe guidelines on RDM (Research Data Management) (Ghent University, n.d.a; Science Europe, n.d.). The European Code of Conduct for Scientific Integrity (ALLEA, 2017), to which Ghent University subscribed, also expects that access to research data is in line with the FAIR principles where appropriate (Ghent University, n.d.b).

Conclusions

Transformation processes in open science in Ukraine are being implemented through the support of an innovative open data policy and open access, taking into account international requirements, which are based on the adoption of the National Action Plan for Open Science (Cabinet of Ministers of Ukraine, 2022). Therefore, the activities of Ukrainian university libraries should be transformed with the support of the SSTL of Ukraine (State Scientific and Technical Library of Ukraine, n.d.d), which will take into account international experience, such as the Leibniz Information Center for Science and Technology in Germany (TIB, n.d.a). The already sustainable (in 2024) experience of Ukrainian university libraries with OERSI (Open Educational Resources Search Index) in the field of open science and its component – open educational

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University Library at a New Stage of Social Communications Development. Conference Proceedings, 2024, No. 9
UniLibNSD-2024

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF
LIBRARIES

resources is presented in the publication (Kolesnykova, Gorbova, & Shcherbatiuk, 2022, p. 72-73). Priority areas can be: 1) the work of local university repositories, for example, the Jagiellonian University (Biblioteka Jagiellońska, 2024), Open Science Outlook 1 (UNESCO, 2023) by updating versions of the DSpace software with the subsequent possibility of displaying the DOI identifier as the PID of publications provided by almost all publishing houses and some publishing platforms (F1000 (F1000Research, n.d), SSRN (SSRN, n.d.a), CROSSREF (Crossref, n.d.), etc.) and the social network of scientists Research Gate (ResearchGate, n.d.); 2) advisory and educational activities with the scientific community of universities and employees of university libraries on the introduction of ORCID initiatives (joining the ORCID-UKRAINE consortium (ORCID, n.d.) and the use of Creative Commons licenses (Creative Commons, n.d.); 3) active use of all sources of open access to metadata provided by international companies, in particular: a) ELSEVIER (Elsevier, n.d.b) (the Scopus database, ScienceDirect, local access to the SciVal analytical system, etc.), b) CLARIVATE (Clarivate, n.d.) (the Web of Science platform, the ProQuest™ Dissertations & Theses Citation Index, RepidILL, etc.), c) Research4Life (Research4Life, 2024), TIB (TIB, n.d.b), OERSI (OERSI, n.d.), TIB AV-Portal (TIB AV-Portal, n.d.); 4) use of preprint repositories (Wikipedia, n.d.) by the scientific community, the metadata of some of them are already indexed by the Scopus and Web of Science scientometric systems, in particular the SSRN of the ELSEVIER company (SSRN, n.d.b).

REFERENCES

ALLEA. (2017). *The European code of conduct for research integrity*. Retrieved from http://surl.li/gspiob (in English)

ALLEA. (2023). *The European code of conduct for research integrity*. Retrieved September 8, 2024, from https://allea.org/code-of-conduct/ (in English)

Azeroual, O., Schöpfel, J., Pölönen, J., & Nikiforova, A. (2022). Putting FAIR principles in the context of research information: FAIRness for CRIS and CRIS for FAIRness. In *Proceedings of the 14th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2022)*. SciTePress, *3*, 63-71. doi: https://doi.org/10.5220/0011548700003335 (in English)

Barabash, V., Hliebova, L., & Kolomiiets, O. (2023). Innovative transformations of libraries of higher education institutions. *Society. Document. Communication, 19*, 10-36.
doi: https://doi.org/10.31470/2518-7600-2023-19-10-36 (in Ukrainian)

Barcelona Declaration on Open Research Information. (n.d.a). *Home*. Retrieved September 7, 2024, from https://barcelona-declaration.org/ (in English)

Barcelona Declaration on Open Research Information. (n.d.b). *Signatories*. Retrieved September 7, 2024, from https://barcelona-declaration.org/signatories/ (in English)

Biblioteka Jagiellońska. (2024). *Konferencja 10 lat RUJ*. [Video file]. Retrieved September 9, 2024, from https://www.youtube.com/watch?v=rA1GsR1v7Fk;
https://www.youtube.com/watch?v=jkzRYQiOT0c (in Polish)

Cabinet of Ministers of Ukraine. (2022, October 8). Pro zatverdzhennia Natsionalnoho planu shchodo vidkrytoi nauky. Rozporiadzhennia, № 892. Retrieved September 7, 2024, from http://surl.li/svtfre (in Ukrainian)

Calilung, R. (2021). Perceptions and practices of academic librarians in handling and managing open education resources (OERs): basis for capacity building plan. *University Library at a New Stage of Social Communications Development. Conference Proceedings, 5,* 53-67.

ISSN 2707-0476 (Online)

University Library at a New Stage of Social Communications Development. Conference Proceedings, 2024, No. 9
UniLibNSD-2024

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF
LIBRARIES

doi: https://doi.org/10.15802/unilib/2020_220361 (in English)

Clarivate. (n.d.). *StandWithUkraine: Resource center for displaced researchers*. Retrieved September 8, 2024, from http://surl.li/encili (in English)

CoARA. (2022). *The Agreement full text*. Retrieved from http://surl.li/vpxsds (in English)

CoARA. (2023). Coalition for advancing research assessment. Retrieved September 7, 2024, from https://coara.eu/ (in English)

Creative Commons. (n.d.). *About CC licenses.* Retrieved September 8, 2024, from http://surl.li/ktupyy (in English)

Crossref. (n.d.). *Search the metadata of journal articles, books, standards, datasets & more*. Retrieved September 8, 2024, from https://search.crossref.org/ (in English)

D'aquin, M., Kirstein, F., Oliveira, D., Schimmler, S., & Urbanek, S. (2023). FAIREST: a Framework for assessing research repositories. *Data Intelligence*, *5*(1), 202-241.
doi: https://doi.org/10.1162/DINT_A_00159 (in English)

EIFL. (n.d.). *Open science for Ukrainian higher education system (Open4UA) project.* Retrieved September 16, 2024, from http://surl.li/sgutam (in English)

Elsevier. (n.d.a). *Open access.* Retrieved September 7, 2024, from http://surl.li/zqwvzy (in English)

Elsevier. (n.d.b). *Ukraine Academic Support.* Retrieved September 8, 2024, from http://surl.li/ssjqpe (in English)

Esteve, A. (2024). Copyright and open access to scientific publishing. *IIC International Review of Intellectual Property and Competition Law*, *55*(6), 901-926. doi: https://doi.org/10.1007/s40319-024-01479-z (in English)

European University Association. (2024). *EUA welcomes the Barcelona Declaration on Open Research Information*. Retrieved September 7, 2024, from http://surl.li/gmxyqm (in English)

European University Association. (n.d.). *The EUA Open Science Agenda 2025*. Retrieved September 7, 2024, from http://surl.li/goueiy (in English)

F1000Research. (n.d.). *Publish fast. Openly. Without restrictions.* Retrieved September 8, 2024, from https://f1000research.com/ (in English)

Ghent University. (n.d.a). *External funder policies.* Retrieved September 8, 2024, from http://surl.li/kwxhiz (in English)

Ghent University. (n.d.b). *FAIR data*. Retrieved September 8, 2024, from http://surl.li/totsi (in English)

INORMS. (n.d.). *More than our rank.* Retrieved September 7, 2024, from http://surl.li/mpgezr (in English)

Kolesnykova, T. O., Gorbova, O. V., & Shcherbatiuk, T. G. (2022). On distance learning, open educational resources, and the role of university libraries in these processes. *University Library at a New Stage of Social Communications Development. Conference Proceedings*, *7*, 66-77.
doi: https://doi.org/10.15802/unilib/2022_271088 (in Ukrainian)

Kudos. (n.d.). *Growing the influence of research*. Retrieved September 14, 2024, from http://surl.li/hygsxx (in English)

Kulyk, M. M. (2022). IT implementation processes in libraries: adopting foreign experience. *University Library at a New Stage of Social Communications Development. Conference Proceedings*, *7*, 86-94.
doi: https://doi.org/10.15802/UNILIB/2022_270925 (in English)

Kulyk, M. M. (2023). Challenges of open science: problems of metadata research and analysis of scientometric indicators of scientists (Experience of the Scientific Library of Yaroslav Mudryi

ISSN 2707-0476 (Online)

University Library at a New Stage of Social Communications Development. Conference Proceedings, 2024, No. 9
UniLibNSD-2024
THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF LIBRARIES

National Law University). *University Library at a New Stage of Social Communications Development. Conference Proceedings*, 8, 167-176.
doi: https://doi.org/10.15802/UNILIB/2023_293991 (in English)

Ministry of Education and Science of Ukraine. (2024b). *Pro pidhotovku zvitnykh dokumentiv* [About the preparation of reporting documents]. Letter, No. 7/137-24. Retrieved September 7, 2024, from http://surl.li/ufzcw (in Ukrainian)

Ministry of Education and Science of Ukraine (2024a, April 10). *Pro pidsumky naukovoi, naukovo-tekhnichnoi ta innovatsiinoi diialnosti zakladiv vyshchoi osvity ta naukovykh ustanov, shcho nalezhat do sfery upravlinnia Ministerstva osvity i nauky Ukrainy, za 2023 rik ta deiaki poperedni periody* [On the results of scientific, scientific-technical and innovative activities of higher education institutions and scientific institutions belonging to the sphere of management of the MES of Ukraine for 2023 and some previous periods]: Nakaz № 493. Retrieved September 8, 2024, from http://surl.li/rkussy (in Ukrainian)

Mumelaš, D., & Martek, A. (2024). Benefits of citizen science for libraries. *Publications 2024, 12*(1), 8. doi: https://doi.org/10.3390/publications12010008 (in English)

National Academies of Sciences, Engineering, and Medicine. (2024). *Accelerating and Deepening Approaches to FAIR Data Sharing: Proceedings of a Workshop – in Brief.* Washington, DC: The National Academies Press. doi: https://doi.org/10.17226/27786 (in English)

Ni, R., & Waltman, L. (2024). To preprint or not to preprint: A global researcher survey. *Journal of the Association for Information Science and Technology*, *75*(6), 749-766. doi: https://doi.org/10.1002/ASI.24880 (in English)

OERSI. (n.d.). *Open educational resources search index.* Retrieved September 8, 2024, from https://oersi.org/resources/ (in English)

Open Science Indicator Handbook. (n.d.). Retrieved September 7, 2024, from http://surl.li/mllzit (in English)

OpenAIRE. (n.d.). *PathOS project workshop: open science monitoring and research libraries.* Retrieved September 7, 2024, from http://surl.li/ufnvzr (in English)

ORCID. (n.d.). *ORCID welcomes Ukraine to global consortia.* Retrieved September 8, 2024, from http://surl.li/seklud (in English)

OSF. (n.d.). *There's a better way to manage your research. OSF is a free, open platform to support your research and enable collaboration*. Retrieved September 14, 2024, from https://osf.io/ (in English)

Papadopoulou, A., & Grypari, I. (2024, July). Unveiling Open Science Impact: Findings and insights from the PathOS project. *In LIBER Annual Conference 2024*, Limassol. Zenodo. doi: https://doi.org/10.5281/zenodo.12699942 (in English)

PathOS. (n.d.). *PathOS Open Science Resources Hub.* Retrieved September 7, 2024, from http://surl.li/gkbtuq (in English)

Pinto, F. A. (2024). Publicação de dados de pesquisa no contexto da comunicação científica:: cenário terminológico-conceitual [Publication of research data in the context of scientific communication: terminological-conceptual scenario]. *Ciência Da Informação*, *53*. doi: https://doi.org/10.18225/CI.INF.V53I.6668 (in Portuguese)

Priess-Buchheit, J., Hermeking, N., & Möbius, T. W. D. (2024). Training to act FAIR: a pre-post study on teaching fair guiding principles to (future) researchers in higher education. *Journal of Academic Ethics*, 1-17. doi: https://doi.org/10.1007/s10805-024-09547-2 (in English)

Research4Life. (2024). *Ensuring continued support for Research4Life users in Ukraine*. (n.d.). Retrieved September 8, 2024, from http://surl.li/eeaifj (in English)

ISSN 2707-0476 (Online)

University Library at a New Stage of Social Communications Development. Conference Proceedings, 2024, No. 9
UniLibNSD-2024

THE CONTRIBUTION OF THEORY AND RESEARCH TO THE TRANSFORMATION OF
LIBRARIES

ResearchGate. (n.d.). *Home.* Retrieved September 17, 2024, from https://www.researchgate.net/ (in English)

Santos-Hermosa, G., & Boté-Vericad, J. J. (2024). Spanish academic libraries' perceptions of Open Science. Drivers and barriers, level of knowledge and training. *Education for Information*, *40*(2), 139-162. doi: https://doi.org/10.3233/EFI-220069 (in English)

Sastrón-Toledo, P., Alonso-Álvarez, P., & Mañana-Rodríguez, J. (2024). Compliance with open access mandates and its effects on research visibility: the case of the Spanish National Plan of R&D. *Scientometrics*, *129*, 2057-2081. doi: https://doi.org/10.1007/s11192-024-04978-5 (in English)

Schmal, W. B. (2024). How transformative are transformative agreements? Evidence from Germany across disciplines. *Scientometrics*, *129*, 1863-1889. doi: https://doi.org/10.1007/s11192-024-04955-y (in English)

Science Europe. (n.d.). *Research Data Management.* Retrieved September 8, 2024, from http://surl.li/awwwoa (in English)

Seminar z formuvannia natsionalnoho konsensusu shchodo vidkrytoi nauky. (2024). Facebook. Retrieved September 7, 2024, from http://surl.li/hgcaqn (in Ukrainian)

Shmagun, H., Shim, J., Choi, K. N., Shin, S. K., Kim, J., & Oppenheim, C. (2024). Korea's national approach to Open Science: Present and possible future. *Journal of Information Science*, *50*(3), 766-785. doi: https://doi.org/10.1177/01655515221107336 (in English)

Springer Nature. (n.d.). *Research data policy.* Retrieved September 7, 2024, from http://surl.li/gvrrdc (in English)

SSRN. (n.d.a). *Sign in Join*. Retrieved September 19, 2024, from http://surl.li/yweqcb (in English)

SSRN. (n.d.b). *Tomorrow′s Research Today*. Retrieved September 8, 2024, from http://surl.li/rcfyqb (in English)

State Scientific and Technical Library of Ukraine. (n.d.c). *DNTB Ukrainy pryime uchast u Paryzkii konferentsii z vidkrytoi naukovoi informatsii.* Retrieved September 7, 2024, from http://surl.li/zbldqc (in Ukrainian)

State Scientific and Technical Library of Ukraine. (n.d.d). *Elektronni resursy* [Electronic resources]. Retrieved September 8, 2024, from http://surl.li/mlicuw (in Ukrainian)

State Scientific and Technical Library of Ukraine. (n.d.b). *Portal konferentsii DNTB Ukrainypo vidkrytii nautsi.* Retrieved September 7, 2024, from https://conference.dntb.gov.ua/ (in Ukrainian)

State Scientific and Technical Library of Ukraine. (n.d.a). *Vidkryta nauka* [Open Science]. Retrieved September 7, 2024, from http://surl.li/yalgat (in Ukrainian)

Taubert, N., Hobert, A., Jahn, N., Bruns, A., & Iravani, E. (2024). Understanding differences of the OA uptake within the Germany university landscape (2010-2020) – Part 2: repository-provided OA. *Scientometrics, 129*, 2801-2825. doi: https://doi.org/10.1007/s11192-024-05003-5 (in English)

TIB AV-Portal. (n.d.). *Science communication with videos: types - benefits - concepts - production - publication*. Retrieved September 8, 2024, from https://av.tib.eu/ (in English)

TIB. (n.d.b). *New in the AV-Portal: Recordings of the "Days of Ukraine in Lower Saxony"*. Retrieved September 8, 2024, from http://surl.li/lefmsq (in English)

TIB. (n.d.a). *Open Science.* Retrieved September 8, 2024, from http://surl.li/itcrdx (in English)

UNESCO. (2023). Open Science Outlook 1: status and trends around the world. Retrieved July 10, 2024, from http://surl.li/sgaeox (in English)

Vallejo-Sierra, R. H., & Pirela-Morillo, J. E. (2024). Prácticas de ciencia abierta utilizadas por investigadores colombianos del área de las humanidades. *Investigación Bibliotecológica:*

ISSN 2707-0476 (Online)

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Archivonomía, Bibliotecología e Información, *38*(100), 107-122. doi: https://doi.org/10.22201/ΙΙΒΙ.24488321XE.2024.100.58888 (in English)

Verma, L. (2024). Librarians' electronic resource reviews network (LERRN): a free citation database for resource reviews. *Journal of the Medical Library Association*, *112*(2), 140-141. doi: https://doi.org/10.5195/JMLA.2024.1862 (in English)

Vezzani, F., Di Nunzio, G. M., & Costa, R. (2023). ISO standards for terminology resources management Are they FAIR enough? *Digital Translation: International Journal of Translation and Localization*, *10*(2), 233-252. doi: https://doi.org/10.1075/dt.00009.vez (in English)

Whalley, W. B. (2023). Landscape domains and information surfaces: Data collection, recording and citation using decimal latitude-longitude geolocation via the FAIR principles. *Earth Surface Processes and Landforms*, *48*(11), 2141-2151. doi: https://doi.org/10.1002/ESP.5678 (in English)

Wikipedia. (n.d.). *List of preprint repositories.* Retrieved from http://surl.li/qchjan (in English)

Yaroshenko, T. (2021). Vidkrytyi dostup, vidkryta nauka, vidkryti dani: yak tse bulo i kudy ydemo (do 20-littia Budapeshtskoi initsiatyvy vidkrytoho dostupu) [Open Access, Open Science, Open Data: how it was and where we are going (to the 20th anniversary of the Budapest Open Access declaration)]. *Ukrainian Journal on Library and Information Science*, *8*, 10-26. doi: https://doi.org/10.31866/2616-7654.8.2021.247582 (in Ukrainian)

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Внесок академічних бібліотек у просуванні відкритих даних та відкритої науки: важелі, переваги та пропозиції (стратегія та пріоритети використання)

Мета. Стаття присвячена дослідженню ролі академічних бібліотек у просуванні екосистеми відкритої науки закордонними та вітчизняними авторами університетської спільноти. **Методика.** У науковому дослідженні були використані такі теоретичні загальнонаукові методи: узагальнення, аналіз та системний підхід. **Результати.** Основою просування (впровадження) відкритої науки є відкриті дані та відкритий доступ, що формує відкриту екосистему наукових досліджень (Open Ecosystem of Scientific Research). Це вимагає трансформації академічних бібліотек України, зокрема університетських, зі зміною кваліфікаційного рівня бібліотечних фахівців та технічного персоналу для допомоги в освоєнні ресурсно-інформаційних новацій бібліотек під час використання різних PIDs (Persistent identifier). **Висновки.** Для наукової спільноти України відбувається формування стратегії відкритої науки, впровадження та просування якої значною мірою буде залежати також від досвіду фахівців академічних бібліотек, за підтримки Державної науково-технічної бібліотеки України (ДНТБ України). Міністерство освіти і науки України (МОН України) визначає пріоритети використання міжнародного досвіду просування відкритих даних та відкритої науки, де академічні бібліотеки відіграють провідну роль.

Ключові слова: академічні бібліотеки; відкриті дані; відкрита наука; PIDs (Persistent Identifier); репозитарії