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## **TURNING OPEN SCIENCE TO REALITY: THE ROLE OF ACADEMIC LIBRARIES**

Recent decades have brought a wealth of open access and open science developments on the level of policy, infrastructure and competence. However, openness has not become an inherent quality of science yet. The presentation reflects on the case of open science related initiatives and practices at the Library of Kaunas University of Technology in Kaunas, Lithuania, and discusses the opportunities and obstacles that academic libraries may encounter when they try to engage with open science.

*Keywords:* open science; open science policies; open access; academic library

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## **ПЕРЕТВОРЕННЯ ВІДКРИТОЇ НАУКИ НА РЕАЛЬНІСТЬ: РОЛЬ АКАДЕМІЧНИХ БІБЛІОТЕК**

Останні десятиліття принесли безліч розробок у сфері відкритого доступу та відкритої науки на рівні політики, інфраструктури та компетентностей. Однак відкритість ще не стала невід'ємною якістю науки. У презентації розглядаються ініціативи та практики, пов'язані з відкритою наукою, на прикладі бібліотеки Каунаського технологічного університету в Каунасі (Литва), а також обговорюються можливості та перешкоди, з якими можуть зіткнутися академічні бібліотеки, коли намагаються долучитися до відкритої науки.

*Ключові слова:* відкрита наука; політика відкритої науки; відкритий доступ; академічна бібліотека

Even though recent decades have brought a wealth of open access and open science developments on the level of policy, infrastructure and competence, openness has not become an inherent quality of science yet. Academic libraries, responsible for providing research information resources, are among the key stakeholders in the open science movement and are bound to pave the path towards transparency, accessibility and inclusion in research. This presentation draws on the case of open science related initiatives and practices at the Library of Kaunas University of Technology in Kaunas, Lithuania, and links them to the broader national and international context. It also briefly presents the results of a bibliometric enquiry into OA publications on the Web of Science and Scopus that show how the number of Lithuanian authors' publications has changed in Open Access (OA) over the last decade and what impact OA policy has on Lithuanian authors' open access publishing.

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Open science is an umbrella term used to denote the concepts of openness, transparency, reproducibility, replication, and knowledge accumulation, which are also essential features of scientific activities. Open science has the potential to change the way universities produce, store and disseminate research and education results. Increasing openness can also change the way universities interact with society. Universities can develop a communication strategy to make Open Science practices known to the whole university and to appoint a senior manager to lead Open Science approaches across the eight pillars of Open Science. The League of European Research Universities (LERU) agree that, in general, there are significant benefits to be gained from the use of open science methods. Perhaps one of the most important messages in this document is to stress the need for cultural change at university level. The universities have to develop a cultural change programme that is necessary to support the changes in principle and practice that Open Science brings. Universities can also develop advocacy programmes that should identify the benefits of Open Science approaches while being realistic about the challenges.

In 2012 the Recommendation on access to and preservation of scientific information from the European Commission (2012/417/EU) was part of a package that outlined measures to improve access to scientific information produced in Europe and to bring them in line with the Commission's policy for Horizon 2020. The new Recommendation, adopted on April 25, 2018, explicitly reflects the developments in areas such as research data management (including the concept of FAIR data, Text and Data Mining (TDM) and technical standards that enable re-use incentive schemes.

For the programme Horizon Europe the requirements are:

- OA Mandate for publications immediately after publishing;
- data sharing as “open as possible, as closed as necessary”.

In Lithuania the requirement to make the results of publicly funded research public is recorded in the Law on Higher Education and Research (2009, revised in 2015 and 2016): “The results of all research work carried out in state higher education and research institutions must be communicated to the public” (Law on Higher Education and Research of the Republic of Lithuania, 2009). However, this Article in the Law is not a directive, as Lithuanian research and study institutions are autonomous legal bodies that decide on access to their research results. On their web pages, almost all the biggest Lithuanian state higher education institutions declare support for the EU policy on open access to research information. Some have adopted internal documents like guidelines on open access to scientific publications and data (European

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Commission, 2018). But the institutional OA policy documents are recommendations rather than mandates.

In 2016, the Research Council of Lithuania (RCL) approved the “Guidelines on Open Access to Scientific Publications and Data” that addresses publications and data from research funded by the Council. The Guidelines say that the data must be preserved for a period no shorter than five years after the completion of the project and that a data management plan must be included in the project proposal. These provisions apply to projects funded by the RCL.

A transition period for the implementation of the Guidelines until the end of 2020 was set to ensure a smooth process. During the transition period, only warning measures were foreseen in case of non-compliance with the provisions of the Guidelines.

In 2021, the transition period for the implementation of the Guidelines was extended until the end of 2022. The interim evaluation of the impact and progress of the Guidelines foreseen in the document by May 2018 was postponed to January 2022. In 2022, when impact evaluation of the Guidelines was carried out (Tautkevičienė et. al, 2022), the transition period was extended until June 2024. Therefore, the requirements presented in the Guidelines still are recommendations rather than mandates.

Since September 2024 there are some changes in the Law on Higher Education and Research regarding open science. A new clause of the Law on Higher Education and Research of the Republic of Lithuania came into force on 1 September 2024. It obliged the Research Council of Lithuania to develop a procedure for implementation and monitoring. Article 51 on Publicity of scientific results says: “In order to ensure the quality of scientific research carried out with the funds of the state budget, the transparency of the use of the funds of the state budget, to increase the possibilities of using the results of scientific research, and to promote the progress of science, all results of scientific research and experimental development carried out in science and study institutions with the funds of the state budget must be made publicly available in open access, insofar as it is not in contradiction with the legislation regulating the protection of personal data, intellectual property, professional, commercial, or state and official secrets, national security and defense, and also the activities of the law enforcement agencies and the public security. The procedure for the implementation of open access to the results of scientific research and experimental development shall be established by the Research Council of Lithuania.”

The Research Council of Lithuania has developed "[Description of the Procedure for Open Access to Research and Experimental Development Results](#)", which obliges the authors of research funded by the Research Council to open publications and manage data in accordance

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with the principles of FAIR, and to open them if there are no reasonable impediments. It also provides requirements/recommendations for research and study institutions.

However, most of the mandatory requirements have been postponed until 2030 in preparation for the changes. The following regulating documents must be in place by 31 December 2026:

- Description of the procedure for monitoring open access to research and experimental development results;
- An action plan for open access to research and experimental development.

Research and study institutions, including KTU, align their activities with national policies and requirements. Right after the RCL guidelines were released in 2016, the Library of Kaunas University of Technology initiated writing and adoption of an institutional policy for the University. The institutional document was aligned with the RCL and did not involve neither an action plan nor monitoring procedures.

The initiation of this document was in line with the Library strategy adopted in 2014 which focused on support for research and studies. The Library has been seen as one of the main advocates for open science in the country since 2005; it has acted as the National Open Access Desk for OpenAIRE since 2009.

The recent decade was also full of activities and events dedicated to Open Science: series of FOSTER seminars (2015–2016), OpenAIRE training events and conferences, seminars in the frame of the programme Research Data Alliance (RDA) National Node Lithuania; there is continuing work on developing materials, attempts to integrate open science training into the university programmes (e.g. a course on Research Data Management for doctoral students, a course on Open Science for researchers in the European Consortium of Innovative Universities), work on promoting citizen science among librarians in the Baltic Countries.

The impact of these activities is difficult to measure but, as open access publishing is a fundamental element of open science, it is interesting to look at the results of the recent bibliometric enquiry into OA publications on the Web of Science and Scopus. They show how the number of Lithuanian authors' publications has changed in Open Access over the last decade and what impact OA policy has on open access publishing.

The comparison involves publications by all authors with affiliations of Lithuanian institutions, authors from Kaunas University of Technology and publications funded by the Research Council of Lithuania in two databases: the Web of Science and Scopus. The data in both databases are similar. Between 2014 and 2023, OA publications by the authors from

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Lithuanian institutions grew by 25% on average. A slightly faster growth can be observed in the overall sample of publications by Lithuanian authors. The growth in the number and percentage of OA publications has been less influenced by RCL Guidelines (2016) than by the requirements of other funders, that have been more stringent and prescriptive. For example, the results of the FP6 funding rounds were more demanding than those of the Horizon 2020, Horizon Europe, etc. Other factors also had an impact on the opening of publications: dissemination of information on OA, training and growth of expertise in this field, etc.

These numbers show clear progress in this area, as the share of publications in open access has almost doubled. However, comparing the overall percentage of Lithuanian authors' publications available in OA with the percentage of RCL-funded publications in OA, it seems that the RCL Guidelines have not had a significant impact on making publications OA, as the overall percentage of Lithuanian authors' publications in OA grew more rapidly than the percentage of publications of RCL-funded projects or KTU. This may be due to the liberal nature of the requirements and postponing the mandatory measures. It may be assumed that other funders, e.g. Horizon 2020, had a greater impact on Lithuanian authors' decision to open publications, as they were requirements rather than recommendations for OA.

Turning open science to reality is a complex and time-consuming process which requires change in the research culture. Even though academic libraries are not decision makers in terms of developing high level policies, they are definitely key players in promoting open science in so many ways. To provide meaningful services and advocate for open science at an academic library, we need to know about global tendencies and seek to implement them on the national and institutional level, develop clear procedures for implementation and monitoring of policies that should be mandates rather than recommendations, raise awareness and develop the competence of researchers and administrative staff, seek support from stakeholders, and be proactive.