



Open Science – enabling systemic change through mutual learning

Small fixes are not enough to reach Open Science’s full potential. Systemic and comprehensive change in science governance and evaluation is needed across the EU and beyond, report experts in a recent Policy Support Facility mutual learning exercise.

As a truly global movement, Open Science strives to improve accessibility to and reusability of research practices and outcomes. But the benefits of Open Science touch almost every aspect of society, including the economy, social innovation, and wider sustainable development goals.

“Open Science is more than Open Access and Open Data; it is a way of looking at the world, with the intent of building a better society.”

Bart Dumolyn, Policy Advisor on Open Science and Responsible Research and Innovation for the Flemish Government

In its broadest definition, Open Science covers Open Access to publications, Open Research Data and Methods, Open Source Software, Open Educational Resources, Open Evaluation, and Citizen Science. But openness also means making the scientific process more inclusive and accessible to all relevant actors, within and beyond the scientific community.

With its many initiatives and programmes, Europe has long championed Open Science practices as a powerful means and excellent opportunity to renegotiate the

social roles and responsibilities of publicly-funded research – and to rethink the science system as a whole.

The Horizon 2020 Policy Support Facility (PSF) gives Member States and Associated Countries the opportunity to request and take part in mutual learning exercises (MLE) addressing specific research and innovation policy challenges. The transition to Open Science represents such a policy challenge which is best tackled in close cooperation with all stakeholders and on an international scale.

Given that there is no common baseline for how to implement Open Science nationally, the MLE embraced a hands-on, ‘learning by doing’ approach supported by external expertise. Concrete examples, models, best practices and knowledge exchanges fostered broader understanding of the implications and benefits of Open Science strategies.

Problems and concerns were discussed in an ‘open’ and constructive fashion. The final PSF report, entitled ‘Mutual Learning Exercise on Open Science: Altmetrics and Rewards’, builds on this rich exchange of experiences, both positive and negative, and provides an overview of various approaches to Open Science implementation across Europe, which include different stakeholders and research communities.

MLE participants agreed that small fixes are not enough: implementing Open Science requires systemic and comprehensive change in science governance and evaluation. Crucial for a successful transition to Open Science will be strategic shifts in the incentives and reward systems.

“There can be no mission-oriented approach to research and innovation without Open Science.”

Michalis Tzatzanis, Austrian Research Promotion Agency (FFG).

Key lessons on the transition to Open Science

The scope of this first MLE on Open Science was narrowed down to address three topics, all of which are key elements of the European Open Science Agenda:

1. The potential of altmetrics – alternative (i.e. non-traditional) metrics that go beyond citations of articles – to foster Open Science
2. Incentives and rewards for researchers to engage in Open Science activities
3. Guidelines for developing and implementing national policies for Open Science

Many MLE participants voiced concerns that altmetrics may encourage a business-as-usual scenario, with users focusing only on what is measurable and ending up with proxies far too simplistic for decision-making. Generally it was agreed that altmetrics have the potential to foster a major shift in the way research activities are evaluated and rewarded, providing they are open and reproducible in their method and data, as well as clearly indicate what qualities they measure.

So, what research qualities and societal benefits matter the most, how can they be tracked and measured, and for what reasons? Altmetrics can only help to break away from traditional indicators and publishing avenues, and establish themselves as responsible metrics if they cover diverse types of research practices and outcomes, according to the report, instead of “overly-simplified one-stop shops”. Here, the MLE confirmed the concerns and recommendations put forward by a dedicated Expert Group on Altmetrics and endorsed the coming activities of a European Forum for Next Generation Metrics.

MLE participants further called for clear goals and missions against which Open Science should be evaluated. Based on cross-national exchanges in the use of altmetrics in policy, the report called for more research on how they could be used not only to promote openness, but also as tools for more profound change – diversifying innovation landscapes and raising awareness of niche pockets of excellence. Altmetrics could also provide visible links between education and science, and help to overcome the problem of research fragmentation across Europe and beyond.

“Participation in the MLE provided a great opportunity to get closer and deeper insight into the implementation of various practices of Open Science. The established contacts and information provided encouraged me to propose concrete measures to our leaders.”

Auša Gribauskiene, Chief Officer of the Science Division of the Ministry of Education and Science of the Republic of Lithuania

It is extremely difficult for researchers to adopt Open Science practices without a broad institutional shift in support and evaluation structures governing their work. Discussions during the MLE revealed that very few Open Science **incentives and rewards** are currently being implemented in participating countries. MLE participants underlined the necessity to develop incentives for different stakeholders: researchers, research organizations and funders, national governments and policymakers.

Since incentives for researchers need to include radical shifts in hiring and promotion procedures, a very good blueprint for future approaches is the

Open Science Career Assessment Matrix (OSCAM). This scheme details the different ways that researchers’ less visible work and other types of research outputs can be acknowledged or measured.

Given the highly international nature of research networks, international coordination is crucial to the effective implementation of comparable measures. Each country, research funder and research-performing organisation needs to review the extent to which specific incentives will work on the ground, and adapt the requirements discussed in the final MLE report accordingly. MLE participants strongly advocated the further development of EU strategies and policies fostering systemic change in the scientific reward system, including pilot programmes and new instruments for human resources, skills and training.

Where next? A roadmap for Open Science

With diverse positions and national initiatives for Open Science at play, the MLE clearly reflected the importance of modular approaches based on monitoring and regular stakeholder exchange. A model roadmap and recommendations for implementing Open Science is described in detail in the MLE report.

However, in order to trigger systemic change in research and research policy, and to make countries fit for the next EU framework funding programme Horizon Europe, several considerations apply:

- The implementation of Open Science needs to be part of the bigger picture, with discussion on the roles and functions of science in society right now, and an agenda and mission for science and innovation based on openness.
- National strategies for the implementation of Open Science are essential to better understand and align the links between Open Science policies and general STI policies. ERA should be the central platform for the development of national OS strategies.
- Champions and role models are needed to foster the uptake of Open Science practices and create a sustainable transition towards more openness.
- Open Science is enhancing knowledge markets and improving innovation. The synergies of scholarly commons (open-access digital repositories) and the commercial exploitation of research outputs require a systematic review and substantial evidence.

Follow-up activities include many presentations of the MLE – nationally and internationally – broad online and offline discussions of the outcomes, and several dedicated events (e.g. presentations in OS-related committees and meetings), as well as a broader dissemination event in Brussels in November 2018. Experts and country delegates alike will ensure the wide dissemination and discussion of the MLE outcomes and thus contribute to European leadership in Open Science in all that it represents.

For further information:

The Final Report of the PSF Mutual Learning Exercise on Open Science: Altmetrics and Rewards
<https://rio.jrc.ec.europa.eu/en/library/mle-open-science-altmetrics-and-rewards-final-report>

The PSF Mutual Learning Exercise Open Science: Altmetrics and Rewards
<https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-open-science-altmetrics-and-rewards>

Thirteen countries participated in the MLE: Armenia, Austria, Belgium, Bulgaria, Croatia, France, Latvia, Lithuania, Moldova, Portugal, Slovenia, Sweden and Switzerland. Over the course of one year, the participants met to explore the best ways to tackle the challenges identified, trigger change and optimise the design and implementation of Open Science policy instruments. Several country visits provided the opportunity to learn from hands-on experience.