

EURASHE Task Force Conclusions on Open Science

In recent years, there has been increasing recognition of the importance of adopting Open Science practices. While there has been much attention to Open Science in the academy as a whole, there has been less attention given to the specific context of the applied sciences. Therefore, this statement aims to consider this perspective, which is important for members of EURASHE in particular.¹ Applied Universities are an important part of research and innovation systems, bridging the gap between theory and practice, and engaging intensively with society and industry. The adoption of Open Science principles by Applied Universities is expected to significantly benefit scientific inquiry, while at the same time, these institutions derive benefits from other institutions adopting such principles. It is therefore essential to include their perspective in discussions around policy and practice of Open Science.

Benefits of Open Science to Research and Society

Open Science, as defined by UNESCO, is the “inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefit of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community”². Open Science improves the quality of scientific output and strengthens the knowledge base of our societies. Open access to data, methodologies, and findings enables researchers, professionals and citizens to build upon or (not) use existing work more effectively.

Scientific inquiry often involves using insights from various actors across a broad range of scientific disciplines and various types of research organisations. Breaking down barriers to participation in research through increased access to scientific information and enhanced data sharing strengthens interdisciplinarity by enabling researchers from diverse backgrounds to contribute their expertise and perspectives. Inclusion of researchers from Applied and smaller, less resourced Universities in the research and innovation ecosystem enhances the efficiency and quality of the scientific process, as well as increasing capacity in the system overall. Adopting an inclusive approach can also minimise unintended duplication and maximise the benefits of replication. Furthermore, openly sharing science infrastructure significantly improves cost efficiency, research quality, and research productivity.

Openness also helps to increase societal trust in science, which has been eroded by cases of scientific misconduct. In particular, Open Science helps to reduce the likelihood of intentional falsification and fabrication of data. By promoting transparency and reproducibility, Open

¹ EURASHE represents Applied Universities in over thirty European countries. Their names vary across countries and include Universities of Applied Science and/or Arts, University Colleges, Professional Universities, Technological Universities, and Polytechnic Universities. They also include comprehensive universities with some applied and professional courses.

² UNESCO Recommendations on Open Science

Science practices can increase confidence in the scientific process, which is crucial for evidence-based policy-making.

Finally, open science boosts partnerships between universities and their stakeholders, including those from their regions and local communities. When research results are more openly available, their visibility and application can strengthen collaboration in other areas, increasing the learning capacity of regions as a whole. This is particularly relevant for the profile and mission of Applied Universities.

Basic and applied science

In recent decades, the line between basic and applied science has become increasingly blurred as interdisciplinary collaboration grew. While research and innovation ecosystems vary from one country to another, scientists focusing on fundamental research are increasingly embracing the application of their discoveries to address societal challenges, whereas scientists focusing on applied sciences are using theoretical insights from basic research to inform practical solutions. Strong synergy between applied and basic sciences is important for scientific progress and the creation of knowledge and innovation that are meaningful to society.

Production and use of FAIR data (Findable, Accessible, Interoperable and Reusable) plays a crucial role in strengthening the bridge between basic and applied science within and between research and innovation ecosystems. This helps make these systems larger, more diverse, and more effective. The free flow of ideas, theories and FAIR data fosters and eases dialogue between various types of institutions, disciplines, and stakeholders in each part of the research process.

Innovation Ecosystem and Open Innovation

Applied Universities are a pivotal part of the (regional) research and innovation ecosystem. They can serve as innovation hubs and knowledge transfer centres, bringing academia, industry, non-profit sector and citizens closer together. Integrating university missions for the service of society, especially at local level, has been captured in concepts such as the 'Fourth Generation' and 'Civic' University. They train a skilled workforce, foster entrepreneurship and help implement regional development strategies. Open Science is crucial in fulfilling these roles and facilitates the achievement of these objectives. It positively impacts education quality due to wider access to scientific results and learning materials. It also aids entrepreneurship by providing access to open-source software, data and research tools, thereby reducing barriers to entry and facilitating product development.

Newly generated knowledge from basic research needs to be openly shared to produce innovative and practical solutions. Open research and scholarship are prerequisites for the dissemination of knowledge to the appropriate stakeholders, who can translate it into technological advancements and innovative solutions to societal challenges. In the early stages of Open Innovation – the knowledge flows across organisational boundaries – Open Science can improve the efficiency of the innovation process as it enlarges firms' and non-profit organisations' external knowledge base. From a regional ecosystem perspective, Open Science can help

different types of knowledge institutions work closer together, including those focused more on basic or applied research.

University-Industry Collaboration

Applied Universities are known for collaborating with industry in both research and education. These collaborations can largely benefit both parties; universities profit from larger financial resources and the engagement of staff and students in projects, while firms and non-profit organisations can rely on access to scientific infrastructure and human capital.

While these collaborations are crucial to creating innovation, Applied Universities are often faced with challenges to openness due to parties thriving by secrecy. On the one hand, researchers strive to maintain principles of transparency through Open Science. On the other hand, private firms often request that certain data remain confidential to safeguard their competitive advantage. Businesses often rely on intellectual property rights, which incentivise investment from the resourceful private sector. Balancing this paradox of openness entails compromising between open data and data confidentiality to capture the benefits of both public research organisations and market forces.

As open as possible, as closed as necessary

Applied Universities often face these challenging trade-offs when it comes to research and data openness. However, transparency should be the norm, unless it is explained in a Data Management Plan (DMP). While achieving full open data in University-Industry collaborations may not always be feasible, researchers can and should insist on making FAIR data a prerequisite. Transparency in the data creation process enhances the possibility of reproducing results and facilitates the detection of errors.

Adhering to FAIR principles ensures that research outputs and methodologies are discoverable, accessible, and reusable by both humans and machines. The institutionalisation of FAIR data practices by both private and public institutions can greatly improve research integrity and ease the path to making scientific inquiry as Open as possible. Furthermore, extensive use of local publication platforms linked to the European Open Science Cloud can improve data sustainability. Ultimately, the implementation of Open Science principles, coupled with a balanced approach to data sharing carries significant positive societal impacts. Therefore, Applied Universities are recommended to share a common commitment to the principle “as open as possible, as closed as necessary”.

The practice of open science continues to grow and is promoted in publicly funded research programmes, including Horizon Europe. Consequently, there is a need for wider consultation of higher education institutions, including those that mainly conduct applied research. EURASHE is a member of the Coalition for Advancing Research Assessment (CoARA), which builds on other global initiatives to reform research assessment. In this context, applied science practices can help focus research assessment on the benefits it provides to knowledge users both within and outside the academy.

Conclusion

Applied Universities play a crucial role in the discourse surrounding open science due to their practical orientation and direct engagement with real-world challenges. These institutions emphasize the application of scientific knowledge to address tangible societal issues, fostering a culture of innovation and collaboration between academia and industry. Their involvement in the open science debate brings a unique perspective, as they often prioritize interdisciplinary research, community engagement and the dissemination of knowledge beyond traditional academic boundaries. By promoting transparency, accessibility and collaboration in research practices, Applied Universities contribute to democratizing knowledge production and advancing the principles of open science, ultimately enhancing the impact and relevance of scientific inquiry for the benefit of society.

About the EURASHE Open Science Taskforce

This statement was developed by a EURASHE Taskforce and approved by the Board on 21 May 2024. Members of the Taskforce that contributed this statement were: Marcel Bogers (Eindhoven University of Technology), Fabien Borget (Aix-Marseille University), Cristina Brandini (SynHERA), Katrien de Smet (AP Hogeschool Antwerpen), Martin Jaekel (Zurich University of Applied Sciences), Teemu Makkonen (Jamk University of Applied Sciences) and Gerben ter Ried (Amsterdam University of Applied Sciences). The work was coordinated by Dominik Koc and John Edwards from the EURASHE Secretariat.