NEGOTIATING OPEN SCIENCE: SOCIOLOGICAL PERSPECTIVES FROM THE AMULET PROJECT

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Abstract

Open Science has become one of the defining transformations of contemporary research systems. While international policies increasingly promote openness, FAIR data, and public accessibility as key principles of scientific practice, their implementation remains shaped by disciplinary differences, institutional contexts, and everyday research practices. This paper presents a qualitative case study of Open Science implementation within the AMULET project. Drawing on perspectives from Science and Technology Studies (STS), it combines qualitative sociological inquiry with participatory approaches to examine how Open Science is negotiated in the Czech research environment. The findings reveal tensions between Open Science principles and their implementation, particularly regarding research data management, disciplinary diversity, institutional preparedness, the evolving role of data stewards, and the sustainability of Article Processing Charges (APCs). The participatory activities demonstrate how digital deliberation can broaden researcher engagement and inform science policy. The paper argues that Open Science should be understood not merely as a technical or regulatory transformation, but as a continuous process of negotiation among researchers, institutions, funding agencies, and policymakers. Its successful implementation therefore depends not only on appropriate infrastructures and institutional support but also on participatory governance that actively involves the research community in shaping future Open Science policies.

Keywords: Open Science; Science and Technology Studies; sociology of science; research data management; Deliberative Participation; science policy.

1 Introduction

Open Science has become one of the defining transformations of contemporary research systems. During the last decade, international organizations, funding agencies, and research institutions have increasingly promoted openness, transparency, FAIR data, and public accessibility as central principles of scientific practice [1–3]. Open access publishing, research data management, and digital research infrastructures are now regarded as essential components of modern research ecosystems. At the same time, an increasing number of studies have shown that the implementation of Open Science is not merely a technical or administrative process but also represents a profound transformation of scientific cultures, disciplinary practices, institutional arrangements, and relationships between science and society [4–7].

From the perspective of Science and Technology Studies (STS), scientific knowledge is produced through interactions among researchers, institutions, technologies, regulations, and broader social contexts [7,8]. Consequently, Open Science should not be understood as a straightforward implementation of predefined policy requirements but rather as a continuous process of negotiation among multiple actors operating at different levels of the research system. While international,

European and national initiatives define common objectives, their practical implementation varies considerably across scientific disciplines, institutions, and local research environments.

The Czech research system has experienced a particularly rapid expansion of Open Science requirements in recent years, driven by European policies, national funding programmes, and institutional strategies. Although these developments have accelerated the adoption of FAIR principles and strengthened research data management practices, they have also introduced new administrative requirements, uncertainties regarding disciplinary differences, and ongoing debates concerning sustainable models of Open Access publishing.

These challenges have become especially visible within large interdisciplinary research projects, where researchers from different scientific backgrounds encounter common Open Science requirements while working with diverse research practices, data types, and publishing cultures. Such projects therefore provide a valuable opportunity to investigate how Open Science is interpreted and negotiated in everyday research practice.

This paper presents a qualitative case study conducted within the AMULET (Advanced MUltiscaLe materials for key Enabling Technologies) project. The paper combines selected results of qualitative sociological inquiry with participatory methods, including a public hearing and an online deliberative platform, to demonstrate both individual experiences and collective reflections on Open Science implementation.

This paper argues that successful implementation depends not only on technological solutions or institutional preparedness but also on recognizing disciplinary diversity and creating opportunities for meaningful participation by the research community. The aim of this paper is therefore to examine how Open Science is negotiated in everyday research practice through a qualitative case study conducted within the AMULET project and to demonstrate how qualitative inquiry combined with digital deliberation can contribute to evidence-informed science policy.

2 Work Performed: Negotiating Open Science in Practice

2.1 Qualitative Sociological Inquiry

The empirical research presented in this paper was conducted within the AMULET (Advanced MUltiscaLe materials for key Enabling Technologies) project between December 2024 and June 2025 [8]. Adopting a qualitative sociological approach inspired by Science and Technology Studies (STS), the study explored how Open Science is experienced and negotiated by researchers and other actors involved in its implementation.

The empirical material consisted of 31 semi-structured interviews with researchers, data stewards, project managers, and other project participants from different scientific disciplines. The interviews were complemented by participant observation and field research. Rather than evaluating compliance with Open Science policies, the study identified recurring challenges and experiences associated with their implementation in everyday research. The findings subsequently informed a public hearing and an online deliberative platform involving the wider Czech research community.

2.2 Negotiating Open Science in Everyday Research Practice

The interviews revealed a recurring tension between the principles of Open Science and their implementation in everyday research. While respondents generally supported openness and transparency,

and responsible research data management, many criticized the growing administrative burden associated with funding requirements and standardized procedures.

Disciplinary diversity emerged as one of the strongest themes. Participants emphasized that common Open Science requirements often fail to reflect differences between research fields. Researchers working with experimental materials and specialized datasets argued that identical requirements cannot always be applied across disciplines. Several respondents also criticized the specific "Czech approach" to implementation, suggesting that some national requirements exceed European standards.

Research data management represented another key topic. Although FAIR principles were widely recognized as beneficial, respondents highlighted practical limitations regarding data sharing and reproducibility. In materials science, for example, datasets alone often cannot capture laboratory knowledge, experimental skills, and specific equipment configurations required to reproduce experiments.

The interviews also highlighted the evolving role of data stewards. Most respondents performed this role alongside their research activities, creating additional professional demands. At the same time, many viewed data stewardship as an emerging profession with the potential to strengthen institutional Open Science capacity.

Institutional preparedness proved to be another important factor. Organizations that had invested in research data management infrastructure and support services before Open Science requirements became mandatory appeared considerably better prepared to meet funding expectations.

Finally, criticism of Article Processing Charges (APCs) was among the most frequently discussed issues. Respondents questioned the long-term sustainability of APC-based publishing models and expressed concerns about unequal access to Open Access publishing, reflecting broader international debates on the economics of scholarly communication [9].

2.3 From Qualitative Research to Public Deliberation

The qualitative findings formed the basis for a broader participatory reflection on Open Science. To extend the discussion beyond individual interviews, the AMULET project organized the public hearing *Making Sense of Open Science*, bringing together researchers, librarians, research managers, policymakers, funding organizations, and other stakeholders [10].

The discussions confirmed many of the challenges identified during the interviews, including disciplinary differences, increasing administrative demands, and concerns regarding APC-based publishing. They also expanded the debate towards national Open Science policy, particularly the potential introduction of Secondary Publishing Rights (SPR) as a mechanism for improving public access to publicly funded research while reducing dependence on APC-funded publishing [11].

The public hearing therefore served not only as a dissemination activity but also as a participatory validation of the qualitative findings, demonstrating that many identified challenges are shared across the Czech research system.

2.4 Online Deliberation and Policy Implications

To further broaden participation, the AMULET project implemented the eDemOS online deliberative platform [12], inspired by participatory democracy tools used, for example, in Taiwan. The platform enabled researchers and other stakeholders to discuss Open Science, vote on individual statements, and formulate recommendations for its future implementation in the Czech Republic.

The discussion revealed broad consensus on several issues. Participants supported creating Open Access publishing conditions comparable to those in countries such as Germany, including stronger protection of authors' publishing rights through mechanisms such as Secondary Publishing Rights. At the same time, the analysis identified two distinct opinion groups. Open Data Optimists represented 69.4% of participants, while Open Data Pessimists (30.6%), consisting predominantly of researchers from the natural sciences and engineering, expressed greater skepticism towards mandatory data sharing and the value of Data Management Plans, which they often perceived as an administrative burden rather than a meaningful research tool [13].

The outcomes of the online deliberation were subsequently presented and shared with selected members the Ministry of Education, Youth and Sports and the Czech Research, Development and Innovation Council. Together with the qualitative interviews and the public hearing, the deliberative platform demonstrates how social science research can not only analyze Open Science implementation but also create space for dialogue and contribute evidence-based recommendations for science policy.

3 Conclusions

This paper examined Open Science implementation through a qualitative case study conducted within the AMULET project. Combining qualitative sociological inquiry with participatory approaches, it demonstrated how Open Science is interpreted and negotiated by researchers and other actors involved in its implementation. The findings show that Open Science is shaped not only by technical infrastructures and policy requirements but also by interactions among researchers, institutions, funding agencies, and policymakers. While respondents broadly supported the principles of Open Science, they identified recurring challenges related to administrative burden, disciplinary diversity, research data management, the evolving role of data stewards, institutional preparedness, and the long-term sustainability of Article Processing Charges (APCs).

The study further demonstrates that qualitative inquiry can be effectively complemented by deliberative methods. The public hearing and online deliberative platform enabled a broader research community to validate the identified challenges, formulate recommendations, and contribute to discussions on Open Science policy. Together, these findings suggest that successful Open Science implementation requires not only appropriate infrastructures and institutional support but also participatory governance that actively involves researchers in shaping future science policy. The author's future research will continue to explore the implementation of Open Science in the Czech research environment, with particular attention to sustainable publishing models, participatory digital tools, and the growing role of artificial intelligence in research data management.

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