

arQus













European University Alliance


Arqus

Openness

Position Paper



Core contributors: Christian Kaier¹  (Co-lead), Hildrun Walter¹  (Co-lead), Florence Belaën², Chérifa Boukacem-Zeghmouri² , María Díaz Urrutia³, María Angeles García Gil³ , Pablo García Sánchez³ , Marie-Emilia Herbet² , Gintė Medzvieckaitė⁴ , Jenny Ostrop⁵ , Tormod Eismann Strømme⁵ , Pia Voigt⁶ , Barbara Weiner⁶ , Michela Zorzi⁷ 

Further contributors: Mauro Apostolico⁷ , Yves Aubert⁵, Eglė Juodė⁴, Tangui Le Bahers² , Barbara Mantelli⁷, Esteban Romero-Frías³ 

¹ University of Graz

² University of Claude Bernard Lyon 1

³ University of Granada

⁴ Vilnius University

⁵ University of Bergen

⁶ Leipzig University

⁷ University of Padua

Published March 15, 2022

doi: [10.5281/zenodo.5881903](https://doi.org/10.5281/zenodo.5881903)



Arqus Alliance. This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).
Logos are excluded from this license.



Co-funded by the
Erasmus+ Programme
of the European Union



Content

1. Preamble	3
2. Vision: A future with Open Science	5
3. Definition of Open Science	7
4. Areas of tension	9
5. Aims and recommendations	11
6. Validity	18
Annex: Achievements of Arqus Institutions	19

1. Preamble

The Arqus European University Alliance acknowledges that Open Science (OS)¹ can increase diversity, equity, inclusion and the notion of scientific knowledge as a public good; the quality of, trust in and public understanding of science; as well as efficiency, innovation and wealth. Therefore, the Arqus universities commit themselves to fostering OS – including Citizen Science, Open Innovation and Open Education – and to coordinating efforts to enhance Openness within and beyond the Alliance in a strategic way. This paper is intended to provide a common basis for this endeavour.

In the framework of this Position Paper the term “Openness” embeds the dynamically evolving idea of OS in the open mindset and vision of a European University Alliance.

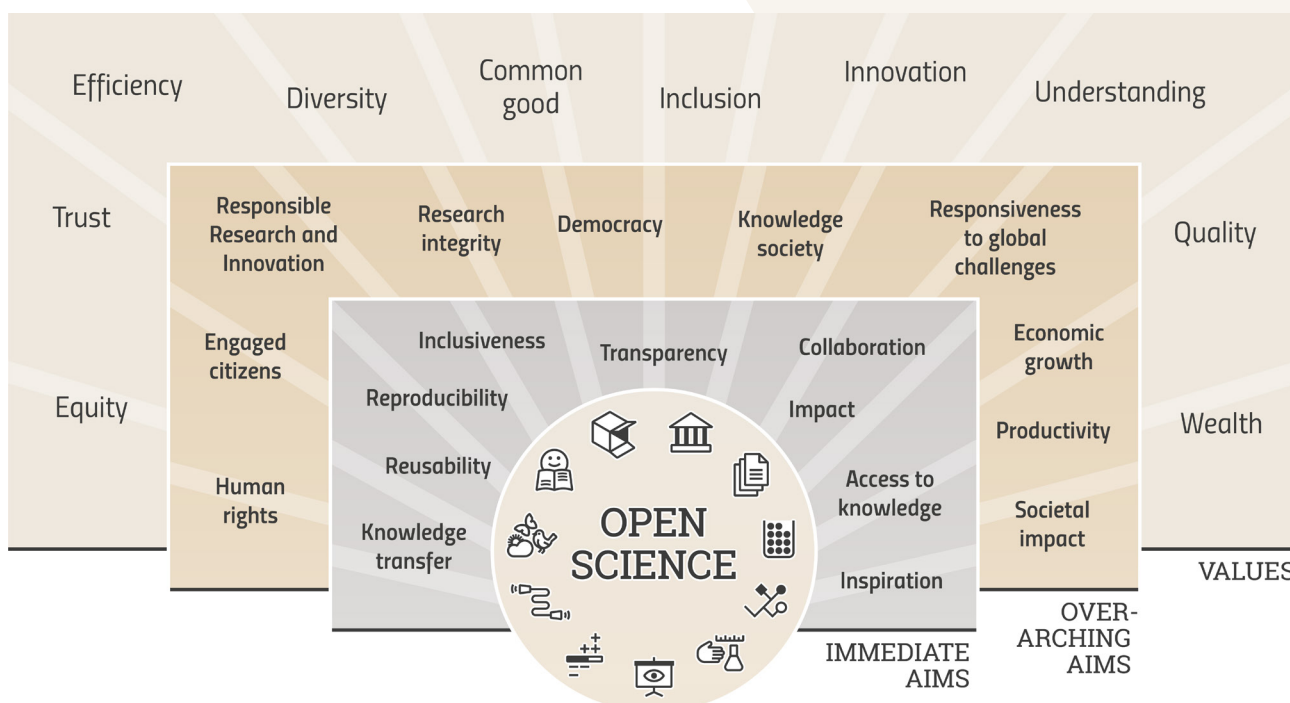
The Arqus European University Alliance brings together the universities of Bergen, Granada, Graz, Leipzig, Lyon, Padua and Vilnius, which share academic, scientific and cultural objectives, a common vision of the role of higher education and research, and mutual fields of interest. The Alliance lays the foundation for building bridges toward a shared future, to respond to the grand societal challenges and to advance towards deeper European integration. It is based on the conviction that by working together it is possible to progress towards existing institutional goals and new Alliance strategic goals faster, better and with greater societal impact than individually. As part of its mission, the Arqus Alliance strives to attain a substantially higher level of quality in education and research, and deeper societal, cultural and civic engagement. The Alliance is committed to actively supporting OS practices, specifically regarding Open Access and Open Data. As an enabling strategy, Openness guides all activities and future-oriented plans for research, education and third mission. The shared vision and mission, core values, major goals and enabling strategies of the Arqus European University Alliance are summarised in its Mission Statement².

¹ This document uses the term “Open Science”, recognising “Open Scholarship” and “Open Research” as synonyms without explicitly using them. The social sciences and humanities are equally addressed here in the same way as the natural sciences.

² Arqus, 2019: [Arqus Mission Statement](#)



European universities have a common history as cornerstones of research and education. In the face of today’s grand societal challenges, the importance of opening them up, recognising knowledge and expertise outside academia, and actively strengthening the relationship with society has become clear and has been highlighted in key declarations. The Lund Declaration in 2009 called for an emphasis on societal challenges, the Vilnius Declaration in 2013 underlined that a resilient partnership with all relevant actors is required if research is to serve society, and the Rome Declaration of 2014 encourages Responsible Research and Innovation. Beyond these, this position paper draws inspiration from a variety of other high-level documents including the UNESCO Recommendation on Open Science³, the Annotated Grant Agreement for the EU funding programmes 2021-2027⁴, the LERU note on Implementing Open Science⁵ and the EUA vision paper “Universities without walls”⁶.



Arqus Alliance/quaint.ch.
 This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Figure 1: The Open Science Cosmos. Arqus attributes a range of values to OS and expects that OS will be instrumental in achieving the immediate and overarching aims mentioned. Proximity of terms is not meant to imply that specific immediate goals are correlated only with nearby overarching goals. The values provide the reasoning for as well as guidance in the transition to OS.

3 UNESCO, 2021: [UNESCO Recommendation on Open Science](#)
 4 EU, 2021: [Annotated Grant Agreement for the EU funding programmes 2021-2027, Pre-draft HE](#)
 5 LERU, 2020: [Implementing Open Science – Challenges and Opportunities for research-intensive universities in LERU](#)
 6 EUA, 2021: [Universities without walls - A vision for 2030](#)



The Arqus Openness Position Paper presents values, principles, and standards shared by the Arqus Alliance and highlights common aims and recommendations on how to achieve them. It builds upon and aims to align existing policies and guidelines already set in place by the Arqus universities. The concept of an Open Science Cosmos (Figure 1) with different spheres is intended to strengthen orientation on the aims and recommendations defined by the Alliance.

All Arqus universities have their own histories and cultural backgrounds that have shaped their respective positions towards OS; however, they share common goals and the vision of an Open University Alliance. While opening up and striving to reach these common goals together, the Arqus universities are determined to uphold values and characteristics of regional research culture and to recognise discipline-specific differences in OS perspectives, since cooperation and collaboration will benefit from this cultural diversity.

The Arqus universities are convinced that OS practices and measures must be implemented in a transparent and participatory process in an accountable manner. They are aware of the importance of paying attention to concerns regarding the transition to OS, since these help to achieve a fair and sustainable advancement of Openness.

The Arqus universities will support and monitor the OS implementation process and carefully review the individual steps of the progressive transformation to OS. They will involve and engage researchers, students and administrative staff in the implementation of OS practices and regulations.

The Arqus European University Alliance commits itself to addressing OS at all institutional levels and to working on all political levels – regional, national and international – to contribute to a world-wide transformation towards Openness in science. To this end and to help make the vision set out below a reality, Arqus will foster partnership, exchange of knowledge and consultation throughout the Alliance to achieve the mutually-agreed goals and to align strategies and practices with universities across and beyond Europe.

2. Vision: A future with Open Science⁷

The year is 2051. Europe and its knowledge society are thriving thanks to its OS and innovation system. In many of Europe's major and growing cities, clusters of well-funded, internationally renowned universities – of which the European University Alliances have formed the core – are flourishing in strong partnerships with regional and global institutions. Education is still the basis for innovation, but it is also central to the overall quality of life as working hours continue to decline. Thanks to Open Education, lifelong learning is available to all: course modules shared within university clusters, online and artificial intelligence-based teaching enable individuals to participate and to engage as critical citizens. To solve global problems, citizens, businesses, universities, and many new players – foundations, NGOs – collaborate in flexible global networks.

⁷ This section is based on Schaper-Rinkel, P., 2021: [Europa im Jahr 2051: Ein offenes Innovationsökosystem für Alle](#)



Research outputs from universities and public research institutions are distributed online, free of cost. Free access to research results – Open Access – has become a matter of course, as has research data shared as openly as possible and according to FAIR principles (findability, accessibility, interoperability and reusability). A culture of research based on Open Peer Review and Open Research Assessment helps researchers to produce high-quality research proposals and publications. These assessment mechanisms have also significantly expanded the understanding of excellence to include impact in terms of societal challenges. Through Open Research Agenda Setting, relevant new research fields and emerging challenges become rapidly visible in a transdisciplinary way. These practices of Open Scholarship could only become effective because Europe has widely promoted open, shared infrastructures at public universities that support collaboration between research, industry and citizens. Open, interconnected infrastructures have emerged from the beginnings of the European Open Science Cloud (EOSC) and form the basis for the network of open European platforms on which collaboration between research institutions, universities, public services, business, industry and citizens takes place.

Until the 2020s, European innovators of the digital transformation and the research community were dependent on the operating systems and platforms of a few global companies and had to submit to their framework conditions. Today, researchers and innovators are continuously evolving their own frameworks in an open, interoperable innovation ecosystem. The impact of this paradigm shift and the development of scalable, open source-based infrastructures has been enormous since the late 2020s: open and public digital infrastructures and platforms have enabled public sector data to be available in real time to researchers, infrastructure providers, industry and citizens. This has fostered rapidly-evolving, high quality and sustainable research and its application to societal challenges, such as inclusion and the decarbonised economy.

Fees and taxes for networked, open platforms of communication and commerce in Europe are far lower today than they were when European businesses and consumers were dependent on private global platforms. The public, open, science-based innovation ecosystems in Europe have driven Open Innovation forward and given new players the chance to develop their ideas together and lead them to success. This in turn has increased tax revenue in Europe and has enabled extensive redistribution, thus promoting inclusion and expanding provision of public research, education and health services.

Openness has become a defining feature of science. The underlying idea has become more powerful than ever: theories, concepts, results, and data represent a common good of humanity, freely shared to innovate, enjoy, and benefit. OS is an interactive pursuit from which no one is excluded and to which everyone can contribute, and from which everyone can benefit without diminishing the benefits to others.



3. Definition of Open Science

Open Science (OS) is a set of good practices, principles and goals that aims to reduce barriers in all aspects of the research process for the benefit of research and society. It encompasses transparency, accessibility, reproducibility, comprehensibility, trustworthiness, participation and inclusiveness in all parts of the research process. OS increases the efficiency of research by making scientific knowledge findable, accessible, interoperable and reusable, thereby accelerating progress and discoveries for the common good.

The most immediate applications of OS include the dissemination of research through Open Access publishing, sharing of research data and methods, and the provision and use of open infrastructures. It means opening up scholarly production in all of its stages (such as publications, data, lab notes, records, software, algorithms, protocols, procedures, workflows, models) with the permission to reuse and redistribute it. OS also includes practices like pre-registration, crowdsourcing, preprint publication, and Open Peer Review. It is increasingly becoming part of guidelines on good scientific practice.

Ideally, OS makes research processes and results accessible to everyone worldwide, without financial, legal or technical barriers, and invites participation, discussion, questioning and reuse.

The term Open Science is a dynamic concept that has grown to include the concepts of Citizen Science, Open Education and Open Innovation.

Citizen Science includes the active participation of lay people in research activities to generate new knowledge in collaboration between the scientific community and society. Citizen Science approaches allow for inclusion of citizens' perspectives, experiences and expertise, thereby strengthening the societal relevance of research questions and research projects, as well as increasing the potential of bidirectional knowledge transfer and productive use of research outcomes in and for society⁸.

Open Education aims at offering high-quality learning environments and materials to everyone in order to widen access and participation. This Position Paper mainly refers to Open Educational Resources, which include resources, tools and practices that provide access to a variety of formal and informal education opportunities.

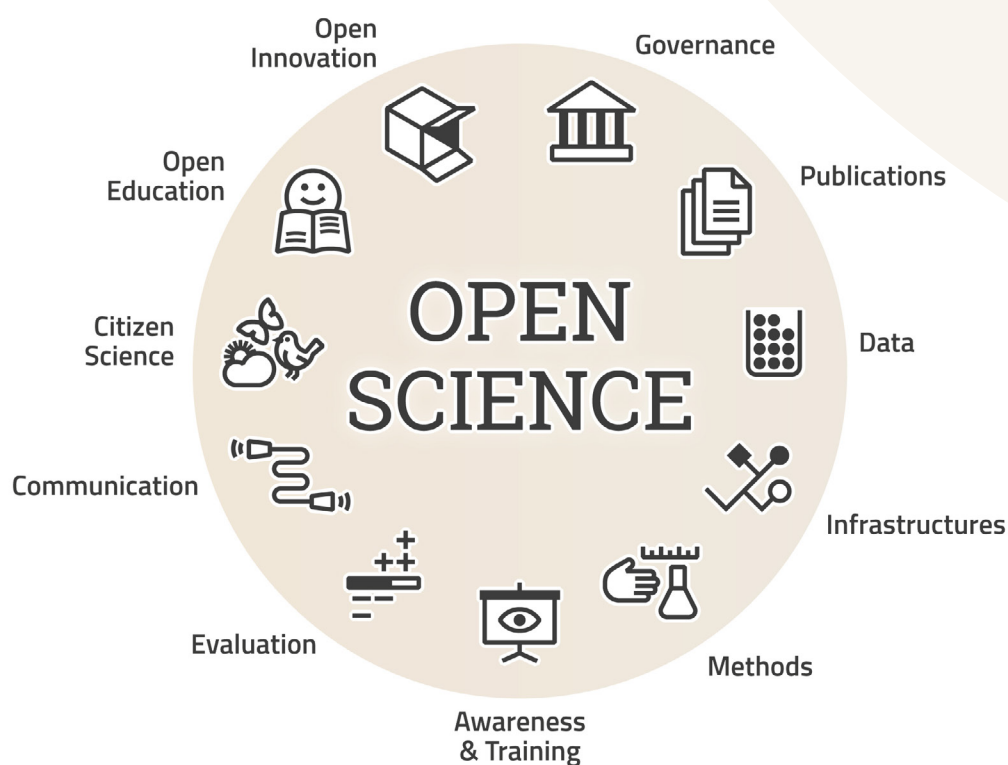
Open Innovation is characterised by a networked, dynamic ecosystem where actors from different environments – businesses, academia, civil society or governments – become part of the innovation process. Building on collaboration and co-creation, Open Innovation facilitates and accelerates knowledge circulation and its transformation into products and services, and can foster economic growth and help solve societal challenges.

⁸ ECSA, 2015: [ECSA Strategy](#); ECSA, 2015: [Policy Paper #1](#); Heigl, F., Kieslinger, B., Paul, K. T., Uhlík, J., & Dörler, D., 2019: [Opinion: Toward an international definition of citizen science](#)



In the process of developing this Position Paper the Arqus Alliance has identified the following core elements of OS (Figure 2) which form the centre of the OS cosmos (Figure 1) above:

- Governance
- Publications (including Open Access)
- Data (including research data management, FAIR⁹ and Open Data)
- Infrastructures (including support staff, OS software and tools, repositories, Open Labs)
- Methods (including source code, preregistration, materials, workflows, protocols, lab notes)
- Awareness and training (including education of early-stage researchers)
- Evaluation (including Open Metrics, research assessment, Open Peer Review, rewards and incentives)
- Communication (including multilingualism)
- Citizen Science
- Open Education
- Open Innovation



Arqus Alliance/quaint.ch.
This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Figure 2: Elements of Open Science

9 Wilkinson, M. D., et al., 2016: [The FAIR Guiding Principles for scientific data management and stewardship](https://www.nature.com/articles/s41587-016-0025-2)



The aims and recommendations outlined in this Position Paper are structured according to these elements of OS.

The numerous positive effects of OS are evident, widely acknowledged and have been outlined above. Nevertheless, substantial changes in research processes such as the transformation to OS inevitably bring complexities with them that require critical consideration. Taking this into account, the next section gives some examples of unresolved questions and challenges that need to be discussed in depth.

4. Areas of tension

OS challenges research processes and stirs up fundamental debates about values, intentions, and incentives. To ensure a sustainable advancement of Openness, it is important to reflect critically on existing reservations and different interests of involved parties.

The Arqus Alliance aims to be a forum for debate and mutual coordination for its members. Both the process of implementing OS practices – including requirements, incentives and metrics, and administrative burden – and the consequences of opening up research outputs – including intellectual property rights, loss of control, and misuse – may and do create areas of tension, such as the following:

- Enabling and fostering the implementation of OS practices requires financial and administrative resources. While it can be expected that an open availability and reusability of data, software, educational material and infrastructures presents great potential for savings and more efficient use of resources, these effects may occur with a time lag and may be distributed unevenly amongst institutions. Thus, such investments must be assessed on a case-by-case basis while also considering non-financial aspects such as community involvement, collaboration with stakeholders, the establishment of robust databases and future-oriented research infrastructure.
- One fundamental debate is about how academic research should be made available to society in order to achieve maximum impact and benefit – in commercial settings or free to access and use. Universities need to find their own approach to this topic, with the rationale depending on their respective research areas and local environments. On the one hand, research is a key factor for the global and regional distribution of economic development, innovative force and wealth; on the other hand, it is meant to serve society by fostering equality, inclusion and the idea of knowledge as a common good. Permission to exploit research results in the form of patent applications allows companies to invest in their ideas, to turn those results into innovations, and then have their investments returned through commercialisation. While publishing research results under an open licence may impede financial profitability, it allows knowledge to be used in different ways, creating its own dynamics in the development of society. Furthermore, there is a political and ethical dimension here: research and research institutions largely depend on public funds, which gives society a legitimate interest in a



valuable return on this investment. This return may be better ensured and more transparent by following OS principles. OS implementation needs to balance these different interests, considering the potential of research to ensure economic sustainability while leaving no one behind and sharing knowledge generated in and about the research process.

- Another controversial issue concerns the extent of intellectual property rights (IPR) attributed to individual researchers or institutions respectively, even more so if findings and inventions might lead to commercial exploitation such as patent applications. To establish sustainable and fair approaches to Openness, a clear definition of the IP framework is needed which ensures acknowledgement and recognition of research contributions. To ensure an optimal path for knowledge transfer, the concepts of OS and IP should be elaborated such that they complement each other.
- Much debate currently focuses on the concept of academic freedom of researchers within the OS framework. This includes not only freedom of inquiry and the free expression of ideas and opinions, but also the freedom of researchers to choose publication venues and communication channels. An obligation to publish research results under an open licence, for example, will restrict individual researchers' options, may limit opportunities for exploitation and may be in conflict with their ambition to publish in closed-access venues that are often still held in high esteem in communities, research assessment procedures and university rankings. Nevertheless, it has been shown that Open Access publications reach a larger audience and receive more citations and resonance. In the creation of OS policies, recommendations or requirements for OS practices could increase over time, depending on institutional or discipline-specific contexts.
- A sustainable transition towards Openness requires a comprehensive change in academic culture, revising ingrained habits and overcoming inclinations to conservatism. Therefore, institutional strategies should incentivise the adoption of OS practices by adapting their assessment criteria for research projects and researchers, while choosing an appropriate pace and degree of obligation for any OS requirements.

Arqus institutions will carefully consider these and further issues in the planning of their transition to OS. There must be a thorough debate that may lead to different forms, velocities and degrees of OS implementation. The ideas of maximising benefits to science and society and supporting the mission and values of publicly funded research should guide specific decisions. Joint action within the Alliance and firm support from the European Union can pool risks and increase benefits through synergies, thus facilitating the transition to Openness for individual institutions.



5. Aims and recommendations

Considering the values, aims and vision attributed to OS while taking into account the caveats mentioned, Arqus aims to make research as open as possible and as closed as necessary over the entire research life cycle, while supporting the development of a research system that is more transparent, trustworthy, accessible and inclusive. Recognising Openness as a fundamental value, the Arqus Alliance aims to advance the institutional transition towards OS from a strategic, practical, cultural and financial perspective. In support of the aims outlined below, the Arqus universities will consider the following recommendations, grouped according to the OS core elements (Figure 2).

OS General

Aims

- Comply with the highest standards of good scientific practice and research integrity
- Build an open and trustworthy environment for research
- Contribute to relevant networks and engage in international bodies
- Promote transdisciplinarity in science
- Reinforce knowledge and technology transfer
- Remove barriers for participation in research
- Align research agendas with the values, needs and expectations of society
- Align strategies and practices with universities across and beyond Europe

Recommendations

- Implement, update, link, align and promote relevant policies and guidelines, such as for OS, research integrity, ethics, Open Access, research data management, Open Data, digital preservation, infrastructure development, research assessment, bibliometrics, Citizen Science, Open Education and Open Innovation
- Reinforce and network support in legal and ethical issues, data management and publication, technical and other skills that are crucial for practising OS
- Exchange experiences and practices with regard to OS within and beyond the Arqus Alliance
- Invest strategically to support OS initiatives (preferably open source, non-profit, and community-governed) in order to foster diversity and prevent vendor lock-in effects
- Support local researcher-led initiatives such as OS communities at Arqus universities
- Participate in networks and interest groups that cover aspects of OS, such as COAR, RDA, LIBER, EUA, ECSA
- Conduct and commission research on strategic, practical, cultural and financial effects of the transition to OS



Governance

Aims

- Enable participation of various stakeholders in the development of OS aims and policies
- Conduct a wholistic and coordinated transition towards OS, while considering and responding to possible negative effects
- Establish a network of OS Ambassadors

Recommendations

- Ensure involvement of the research community in the creation of new policies
- Monitor and evaluate the implementation of OS at Arqus institutions based on common standards, and display data on the current status
- Appoint an OS coordinator or a steering group to decide on strategic issues
- Define the role of an OS Ambassador and identify OS ambassadors at each institution to give discipline-specific advice and recommendations, and connect them across and beyond Arqus



Publications

Aims

- Encourage the research output of the Arqus universities to be made available under an open licence
- Cooperate across and beyond Arqus to achieve a joint and sustainable transition to Open Access
- Provide guidance and support for researchers on all questions pertaining to Open Access publishing
- Provide resources to implement, sustain and further develop institutional, academic-led and non-profit Open Access publishing venues

Recommendations

- Encourage researchers to make their scholarly publications openly available, ideally under an open licence, if necessary after an embargo period
- Recommend that authors retain their copyright when publishing and grant non-exclusive licences to publishers
- Recommend upload of publications in institutional repositories and/or research information systems
- Provide funding for Open Access publications via publication funds and include Open Access criteria in any negotiations with publishers
- Host and support Open Access journals and books through university presses and open publishing platforms
- Participate in initiatives for quality-assured, non-profit, possibly academic-led diamond Open Access publishing venues



Data

Aims

- Ensure proper management of research data by using data management plans to guarantee reproducibility of research results as well as research integrity
- Make research data produced within the Arqus Alliance available as open as possible, as closed as necessary, in trusted repositories in line with FAIR and CARE¹⁰ principles
- Provide comprehensive support for researchers across the research data life cycle

Recommendations

- Support researchers in making research data findable, accessible, interoperable and reusable according to the FAIR Principles in a trustworthy data repository or infrastructure
- Enable and ensure long term preservation of research data for at least 10 years after the end of a research project
- Promote and use (metadata and technical) standards approved by communities, preferably non-proprietary ones
- Recommend that researchers use open licences for research data as well as for related metadata
- Define roles and assign resources for discipline-specific data stewardship and support, including advice on creating data management plans
- Engage actively in the realisation of the European Open Science Cloud

Infrastructures

Aims

- Increase the use of open source software and research data management tools that commit to Openness and FAIR principles as well as to the Principles of Open Scholarly Infrastructures¹¹
- Foster interoperability and use common standards of digital infrastructures to reduce fragmentation and improve accessibility of data and content
- Provide researchers with the resources and services to practice OS, including permanent, safe and trustworthy access to storage facilities and data repositories, electronic lab notebooks and data management support
- Make physical and digital infrastructures accessible to researchers from other institutions as well as to citizens and other stakeholders

¹⁰ GIDA, 2018: [CARE Principles of Indigenous Data Governance](#)

¹¹ Bilder, G., Lin, J., Neylon, C., 2020: [The Principles of Open Scholarly Infrastructure](#)



Recommendations

- Provide researchers with access to tailored, trustworthy OS infrastructures by establishing and sustaining own repositories or discipline-specific, national or international infrastructures that comply with established quality standards
- Build, promote, run, use, and sustain interoperable, FAIR compliant infrastructures that are based on open-source software and make data and content available via open interfaces
- Review technical characteristics of infrastructures at Arqus universities (technology, software, interoperability, protocols, harvesting, standards) and collaborate to further develop them
- Establish services dedicated to the promotion and use of open-source software
- Offer and support electronic lab notebook software
- Implement and use persistent identifiers such as RRID, ROR, ORCID and DOI for all institutional research infrastructures
- Install open laboratories and factories that allow students and external users to freely experiment and drive pilots to foster creative research and Open Innovation
- Provide long-term financial support for selected, quality-assured, preferably community-owned open infrastructures and tools, based on transparent criteria



Methods

Aims

- Make outputs generated during the research process such as materials, workflows, protocols and lab notes available to improve reproducibility and allow for quality assurance
- Give access and assign licences to software source codes
- Increase preregistration of research activities

Recommendations

- Request digital documentation of research activities, for example by establishing the use of data management plans or open lab notes
- Encourage researchers to publish research methods, including materials, workflows, protocols, experiments and lab notes, and to preregister studies
- Encourage researchers to publish source code under an open licence



Awareness and Training

Aims

- Inform and educate researchers and students on OS policies, principles, values, advantages, limitations, opportunities, terms, requirements, standards, tools and practices
- Provide researchers and students across Arqus universities with training and up-to-date resources for OS and prepare them for upcoming changes in research assessment
- Integrate OS into curricula where possible

Recommendations

- Make OS policies, support services and activities visible at and across Arqus universities
- Create and keep up to date a website with essential information on principles, tools, resources and local contact points for OS
- Make researchers and students aware of the close connection between OS and good scientific practice
- Develop, offer and share tools, tutorials and OS training courses within Arqus with a focus on early-stage researchers covering principles and values of OS, copyright, data literacy, legal, ethical and data management skills, traditional and alternative metrics and assessment criteria as well as the use of OS tools
- Establish credible introductory OS courses for students, such as an Arqus OS lecture series
- Introduce rewards for OS practices, such as Arqus OS prizes



Evaluation

Aims

- Strengthen and align the recognition of and rewards for OS practices throughout the Arqus Alliance
- Make research assessment more transparent and open for discussion
- Establish common OS criteria such as the OS-CAM¹² criteria within Arqus and make them transparent in research assessment, recruitment and promotion processes
- Consider OS criteria equally with classical (bibliometric) assessment methods
- Increase the use of qualitative rather than quantitative assessment approaches and acknowledge a diversity of forms of research outputs
- Promote and acknowledge Open Peer Review as a form of transparent quality assurance, while safeguarding for the risks to equality and inclusion

12 Working Group on Rewards under Open Science, 2017: [Evaluation of Research Careers fully acknowledging Open Science Practices](#)



Recommendations

- Examine alternative assessment approaches, indicators and metrics, taking account of discipline-specific differences and including Citizen Science, Open Education and Open Innovation contributions
- Record, acknowledge and reward a broad range of OS activities across the research life cycle in evaluation, promotion, hiring and tenure processes, such as publication of pre-prints and research data, use of open licences, open source code and open source software, preregistration, Open Peer Review, public outreach and engagement activities like science communication, Citizen Science and entrepreneurship initiatives
- Align with the DORA declaration, follow the Leiden Manifesto principles and support the European Commission's initiative on reforming research assessment
- Acknowledge contributions to research beyond authorship and include the Contributor Roles Taxonomy (CRediT taxonomy) in research assessment
- Introduce open metrics in the local research assessment system

Communication

Aims

- Encourage the dissemination of scientific knowledge to a wide range of audiences through a multitude of channels adhering to the principles of open and equitable access
- Enable an open dialogue between researchers and societal actors in order to identify priorities and to support mutual understanding, knowledge transfer and engagement
- Enhance multilingualism by supporting the use of local languages in scholarly communication

Recommendations

- Encourage researchers to provide scientific information in various formats, considering scientific journalism, popularisation of science, open lectures and various forms of social media communication
- Provide support through research communication offices to help researchers communicate their research questions, projects and results
- Foster communication formats that aim for open dialogue
- Support the integration of lay summaries in local languages for scholarly journals hosted at Arqus institutions and beyond



Citizen Science

Aims

- Intensify collaboration with laypersons and experts outside academia, recognising external knowledge to co-create new scientific knowledge
- Enable the engagement of all parts of society in research activities across disciplines, also encouraging the inclusion of hard-to-reach and disadvantaged groups
- Integrate local knowledge in research processes following integrity standards such as collective benefit, authority to control, responsibility, and ethics (CARE principles)
- Recognise publications and other contributions from citizen scientists, created individually or in participatory processes, if they meet scientific quality standards

Recommendations

- Acknowledge the potential of Citizen Science and support local initiatives
- Exchange experiences in participatory research and foster mutual support networks within the Arqus Alliance
- Adopt the 10 ECSA Principles of Citizen Science in order to ensure a common understanding of Citizen Science that includes genuine engagement and acknowledgement of citizen scientists
- Conduct and support research on Citizen Science at Arqus universities in order to evaluate participatory methods for their reliability and impact
- Raise awareness of rights and responsibilities when working with citizens, such as in the design of the Informed Consent Procedure
- Establish institutional contact points for researchers, students and citizens to provide information about funding opportunities, national and EU policies, best practice, legal and ethical aspects, tools and toolkits as well as ongoing projects and opportunities for participation



Open Education

Aims

- Increase the use, development and publishing of Open Educational Resources (OER)
- Promote a culture of sharing OER
- Provide high quality OER to support open teaching and learning and to promote inclusion

Recommendations

- Recommend that staff and students use and create high quality OER and publish them on appropriate infrastructures and under an open licence if the legal framework permits
- Support staff and students in the use, creation, publication and sharing of OER by offering consulting services, qualification measures and the provision of information material



Open Innovation

Aims

- Develop an open, interoperable innovation ecosystem
- Stimulate mutual knowledge and technology transfer and inspiration while considering legitimate interests of contributors and data protection rights
- Foster the co-creation of innovative products and services through collaboration with stakeholders such as businesses and the public sector

Recommendations

- Offer education on Open Innovation and foster an Open Innovation culture
- Explore ways to open up selected innovation processes, making connections between inside-out and outside-in transfers of knowledge and innovation
- Establish contact points for entrepreneurs seeking to cooperate and share knowledge
- Create Open Innovation hubs at each Arqus university
- Conduct and support research on Open Innovation at Arqus universities

6. Validity

The Openness Position Paper was approved by the Arqus Rectors' Council on January 10, 2022.

The Openness Position Paper was created by representatives of all Arqus institutions and will be updated as deemed necessary.



Annex: Achievements of Arqus institutions

Arqus institutions have made considerable progress in the implementation and support of OS practices and offer tools and solutions for a wide range of topics. The examples below illustrate what has already been achieved in the effort to make OS a reality:

Governance

In 2020 the **University of Bergen** adopted a policy for OS covering the areas Open Access to research publications and artistic research, Open Access to research data, Open Innovation, Open Educational Resources, and Citizen Science. The policy for OS applies to research, education, and dissemination at the University of Bergen.

Vilnius University aims to have its institutional OS Policy document approved by Spring 2022. The policy will cover the areas of research publications, data, Open Educational Resources, Citizen Science and infrastructure. It will apply to all groups of the Vilnius University community: researchers, students and non-academic staff. The Policy document should be complemented by an implementation plan by 2023.

Publications

The **University of Bergen** supports Open Access publishing through publishing agreements with several publishers, through an Open Access publication fund, and by hosting Open Access journals. Researchers are required to upload a peer-reviewed version of all research articles to its institutional repository, Bergen Open Research Archive. As a result, the share of Open Access articles at the University of Bergen has increased continuously, reaching 73 percent in 2020.

The **University of Graz** offers extensive support to journal editors, hosting more than 20 Open Access journals and series. A library publishing programme for Open Access books is being established to provide a non-commercial alternative for authors affiliated with the university.

The **Leipzig University** Library is host to the OS Office, offering Open Access publication services, individual counselling and a publication server, an Open Access publication fund for journal articles, monographs and non-commercial publications as well as text and data mining services. Leipzig University is a member of the German ORCID consortium and gives assistance for researchers to use ORCID in an appropriate way.

Data

At the **University of Granada**, the institutional repository Digibug, established in 2009, collects digital documents generated at the university and supports the dissemination of research data as well as Open Access publications in line with Article 29.3 of the Horizon 2020 programme (now Horizon Europe).

The research data management team at **Leipzig University**, a collaborative effort of the research services department, the University Library and the Computer Centre, offers services from individual counselling to specific research data management courses as well as a wide range of training materials and technical support.

The library of **University of Claude Bernard Lyon 1** has been running the project Dataacc.org since 2019, with the aim of improving research and data management in chemistry and physics. Dataacc.org provides a wide range of information related to data management plans, open formats and disciplinary-specific data repositories. A monthly newsletter keeps researchers informed about recent developments in research data management and Open Access. The project also addresses the issue of electronic laboratory notebooks, providing access to software packages adapted to the researchers' needs.



Infrastructures

The library of the **University of Claude Bernard Lyon 1** hosts the platform “Open Access & Frais de publication” which offers extensive information on Article Processing Charges (APC). It provides researchers with access to the pricing policy of more than 13,000 journals as well as to the libraries’ agreements with publishers, to facilitate Open Access publishing.

The **University of Padua** Digital Library provides users with an online help service based on a ticketing system for support requests on Open Access.

Vilnius University provides its research community with a technical infrastructure that enables the implementation of OS principles: an online data management planning tool, an Open Access research data repository and an Open Access repository for publications and electronic theses.

Methods

The **University of Granada** established a Free Software Office in 2010 which advises, promotes and trains university members on software licensing, open formats, publication of datasets and other aspects of OS.

Awareness and Training

The International Research Office of the **University of Padua** has launched the Master Class@UniPD, an intensive three-day training session designed to provide researchers with the technical and methodological tools for successful proposal writing and with useful information about available funding opportunities. One out of five learning modules is dedicated to the compliance with EU ethical requirements in research and OS (Open Access and data management plans).

Vilnius University library has a division dedicated to OS training and raising awareness of topics related to OS. Training events on Open Access publishing and research data management are regularly offered to PhD students as part of the doctoral training programme. In addition to this, each autumn, Vilnius University library representatives hold a “Data Day” at two faculties of the university: a research data management training event for research staff with a focus on a specific discipline or group of disciplines. They also participate in the international Open Access Week.

Evaluation

University of Claude Bernard Lyon 1 has signed the DORA declaration and is part of the national working group “GT Evaluation DORA” working to increase recognition of OS practices in the national research assessment system.

Communication

The Seventh Faculty: Centre for Society, Science and Communication at the **University of Graz** is dedicated to science communication and knowledge transfer in innovative formats for a multitude of audiences. Each format is tailored to its respective target audience, aiming to foster understanding, interaction and engagement.

The **University of Padua** Digital Library publishes a monthly newsletter on “Open Science, Academic Publishing and Library Science”: the newsletter is initially being sent to librarians with the intention to „train the trainers“, the plan is to extend this to professors, researchers, and PhD students.



Citizen Science

The Botanical Garden of **Leipzig University** offers different societal groups various ways to get involved in research projects: for example, children can learn about biodiversity in the “Green School”, or participate in various transdisciplinary workshops on ecology and sustainability, politics and society, or legal issues and ethics. Research projects dealing with climate change are open to citizens, inviting them to collaborate on all aspects of data collection, data analysis and data visualisation.



Open Education

The Centre for Digital Teaching and Learning at the **University of Graz** is setting up an institutional Open Educational Resources (OER) repository, supports the creation of OER (especially in the form of videos) and helps teachers to create OER materials for self-study and courses.

The **University of Bergen** is implementing an OER repository. The goal of the University of Bergen is that researchers and students will be able to develop, publish, and use OER as an integrated part of research-based education.



Open Innovation

UGR-Medialab – Research Laboratory for Digital Culture and Society at the **University of Granada** is an open physical and digital space to promote participatory OS. Within this laboratory, projects with private and public institutions based on participation and open civic innovation have been developed, such as Laboratorio 717 – Laboratory of Participation and Democratic Innovation of Andalusia, and UnInPública Network, a network for public innovation from universities.

