

Project title NEOLAIa, Transforming Regions for an Inclusive Europe
Project acronym NEOLAIa
Project no. 101124794
Call Identifier ERASMUSEDU-2023-EUR-UNIV-2

NEOLAIa

Transforming Regions for an Inclusive Europe

WORK PACKAGE 8 – Adopting & Sustaining Open Science Deliverable 8.1 Initial Report on the NEOLAIa Open Science Policy

June 2024

WP8	D8.1 Initial Report on the NEOLAIa Open Science Policy
WORK PACKAGE	WP8 – Adopting and Sustaining Open Science
DELIVERABLE	D8.1 Initial Report on the NEOLAIa Open Science Policy
DATE	25-06-2024
CONTRACTUAL DELIVERY DATE	M6/June 2024
VERSION	1
DISSEMINATION LEVEL	Public
WORK PACKAGE LEADER / TASK LEADER	Work Package Leader and Task Leader of Tasks 8.2 and 8.3 Prof Vittorio Scarrano, UNISA Task Leader of Task 8.1: Prof George Giaglis, Marianna Charalambous, Tonia Damvakeraki, UNIC
CONTRIBUTORS	University of Jaén, Örebro University, Bielefeld University, University of Ostrava, University of Nicosia, Ștefan cel Mare University of Suceava, University of Tours, University of Salerno, and Šiauliai State University of Applied Sciences
Project WEB SITE	https://neolaiacampus.eu/

Document History

Version	Date	Who	Description
0.1	18.04.2024	University of Nicosia	First Complete Deliverable
0.2	26.04.2024	All partners	Reviewed, submitted feedback

0.3	19.05.2024	University of Nicosia, University of Salerno	Finalized and submitted to Peer Quality Assessment Committee
0.4	28.05.2024	University of Nicosia, University of Salerno	Addressed feedback by Peer Quality Assessment Committee and submitted to Executive Committee
0.5	25.06.2024	University of Nicosia, University of Salerno	Addressed feedback by Steering Committee and submitted to Coordinator

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Quality Control

Role	Date	Reviewer	Approved/Comment
Internal Review	26.04.2024	WP8 Delegates	Document accepted; only minor changes suggested.
Peer Quality Assessment Committee	20.05.2024	Renata Šivickienė, Project Manager, Lecturer, Šiauliai State University of Applied Sciences WP1 Delegate	Document accepted; only minor changes suggested
Peer Quality Assessment Committee	20.05.2024	Irmantas Pilypas, IT technician, Assistant lecturer, Šiauliai State University of Applied Sciences, WP9 Delegate	Document accepted; only minor changes suggested
Executive Committee	06.06.2024	Prof. univ. Dr. Carmen NASTASE Stefan cel Mare University of Suceava	Document accepted; only minor changes suggested
Executive Committee	07.06.2024	Dr. Amelie Labusch Universität Bielefeld	Document accepted; only minor changes suggested
Steering Committee	22.06.2024	Steering Committee	Accepted providing the changes suggested are addressed

Table of Contents

Table of Contents	5
1. Used terms and abbreviations	6
2. List of figures	8
3. Introduction.....	8
4. Executive summary/abstract.....	11
5. Description	11
5.1 Definition of Open Science	11
5.2 Definition of Citizen Science	12
5.4 Methodology Approach Towards the NEOLaIA Open Science Policy (NEOL)	18
5.5 NEOLaIA Universities Open Science Policies Status	19
University of Nicosia	19
University of Salerno	21
University of Jaén	24
Bielefeld University	27
Örebro University	27
Šiauliai State University of Applied Sciences	31
“Ștefan Cel Mare” University of Suceava	33
University of Ostrava	34
5.6 Other Alliances’ Open Science Policies.....	36
5.7 NEOLaIA Alliance Open Science Policy – Main Pillars	37
6. Conclusion - Foreword	39
7. References.....	39

1. Used terms and abbreviations

APCs: Articles Processing Charges for open access publications in hybrid journals.

BPC: Book processing charges

CC license: Creative Commons License

CHARM-EU Alliance: Challenge-driven, Accessible, Research-based, Mobile European University. The CHARM-EU Alliance is a European University alliance, co-funded by the Erasmus + Programme, aiming to design and create a new university model to become a world example of good practice to increase the quality, international competitiveness, and attractiveness of the European Higher Education landscape.

CoARA: Coalition for Advancing Research.

CRIS: Current Research Information System

CRUI: The Conference of Italian University Rectors (CRUI) is an association of both public and private universities.

DAPE methodology: Diagnosis, Alignment, Pilots/Practices, and Engagement/Education/Training

DAU: Data Access Unit

DiVA portal is a finding tool and an institutional repository for research publications and student theses written at 50 universities and research institutions.

A **DOI**, also known as the “Digital Object Identifier,” is a unique identifier that consists of various numbers, symbols, as well as letters. It is used to enduringly recognize and identify a document, hence linking it to the web. A Digital Object Identifier will assist the reader in effortlessly locating a particular written academic output from a citation.

DORA: The San Francisco Declaration on Research Assessment.

ECSA: European Citizen Science Association

EDUO: Education Sector

EGA: European Genome-Phenome Archive.

ENCA: Spanish National Open Science Strategy

EOSC-A: European Open Science Cloud Association.

EUNICE: The **European University for Customised Education**; it is a transnational alliance of public universities founded in 2020 and currently present in ten countries: Belgium, Finland, France, Germany, Greece, Italy, Poland, Portugal, Spain, and Sweden.

European OpenAIRE Guidelines: Provide orientation for repository managers to define and implement their local data management policies in compliance with the Open Access demands of the European Commission.

FAIR Principles: Findability (ensures that data is easy to locate for both humans and computers), Accessibility (ensures that data can be accessed by humans and machines, under well-defined conditions), Interoperability (ensures that data can be integrated with other data and can be used in different applications and workflows), and Reusability (ensures that data can be reused in future research and applications.)

GDPR: General Data Protection Regulation

‘Gold Route’: Refers to the published version of the research paper that is freely available online in an Open Access journal, without an embargo period. Publishing in Open Magazines (Gold Route) is defined as the publication of a research paper in e-journals, freely accessible to anyone and free of charge, in which, academic and research articles that have been evaluated are published. These journals are issued either by traditional publishing organizations or by Open Access Exclusive Publishers or by new forms of publishing.

‘Green Route’: Refers to an article being published in a subscription journal and depositing the final accepted version (post-print) in an institutional repository.

HAL: The national platform HAL (Hyper Article en Ligne) is the institutional repository to ensure international visibility and long-term preservation of its publications.

HEI: Higher Education Institute.

IMI: Innovative Medicines Initiative.

ISSN: ISSN (International Standard Serial Number) is the international number that identifies serial publications (newspapers and periodicals, book series, yearbooks, etc.), whether printed or electronic, and allows for unique identification even if there are several publications with the same title.

LOSU: Organic Law of the University System in Spain.

MedOANet: An EU funded project that addresses the necessity for coordinated strategies and policies in Open Access to scientific information in Europe. The project will enhance existing policies, strategies and structures for Open Access and will contribute towards the implementation of new ones in six Mediterranean countries: Greece, Turkey, Italy, France, Spain, Portugal. It will also promote national and regional coordination of policies, strategies, and structures in these six countries and beyond.

MUR: The Italian Ministry of Education, University, and Research

NEOL Approach: The NEOLAiA Alliance is pioneering a methodical progression towards Open Science, captured in the **NEOL (Navigate, Engage, Outline, Launch) Approach**.

OA Publications: Open Access publications.

OER Policy: Open Educational Resources Policy.

Open Access to Scientific Information: free, direct, and royalty-free online access to digital academic and scientific content.

ORCID: (Open Researcher and Contributor Identifier) is a registry of unique identifiers for researchers and scholars.

OSN: Open Science Network of Bielefeld University

PASTEUR4OA: Open Access Policy Alignment Strategies for European Union Research is an EU project that aims to stimulate policy development to ensure Open Access to all outputs from European publicly funded research.

PNSA: Italian Plan for Open Science

PUBL: Public Sector

ReCode Project: The ReCode Project is a community-driven effort to preserve computer art by translating it into a modern programming language (Processing).

RUJA: Open Access Institutional Repository of Jaén

Scientific Research sets out scientific articles published in scientific journals or conference proceedings.

SDGs: Sustainable Development Goals

SND: Swedish National Data Service

SUHF: Swedish Higher Education Institutions

UNESCO: United Nations Educational, Scientific and Cultural Organisation.

UNISA IRIS: University of Salerno electronic infrastructure.

YUFE: Young Universities for the Future of Europe.

2. List of figures

Figure 1 - Citizen Science Disciplines	13
Figure 2 – Open Data – Open Access – Citizen Science under the UNESCO Open Science umbrella. Image by Lotta Tomasson, VA CC BY-NCE 2.0, [When et al. (2020)].....	17
Figure 3 - NEOLAIa nine pillars in the context of UNESCO Open Science "umbrella" definition.....	38

3. Introduction

NEOLAIa, with its motto 'Transforming Regions for an Inclusive Europe', is an Alliance of nine European Universities co-funded by the European Commission in its 2023 call for the period 2024-2027. The aim of NEOLAIa is to transform regional connectivity by embracing (i) digital transformation, through (ii) inclusion and diversity in a context of (iii) enhanced mobility, which are the three pillars of the project.

To achieve this end, “NEOLAIa, Transforming Regions for an Inclusive Europe” is based on ten lines of action:

- WP1 Project Management.
- WP2 Improving Teaching and Learning
- WP3 Diversity and inclusion - Overcoming barriers to participation.
- WP4 Enhanced Mobility
- WP5 Increasing Regional Research Impact
- WP6 Entrepreneurship - NEOLAIa Capabilities for the society of tomorrow
- WP7 Towards a multilingual and intercultural European university
- WP8 Adopting and Sustaining Open Science
- WP9 Digital Transformation
- WP10 Sustainability and dissemination

The NEOLAIa Alliance consists of nine partners: University of Jaén, Örebro University, Bielefeld University, University of Ostrava, University of Nicosia, Ștefan cel Mare University of Suceava, University of Tours, University of Salerno, and Šiauliai State University of Applied Sciences.

Work Package 8, focuses on **Adopting and Sustaining Open Science**, plays a critical role in aligning the alliance with the broader European agenda of making scientific research more open, collaborative, and accessible.

The aim of WP8, Adopting and Sustaining Open Science, is to:

- Increase researchers’ early knowledge-sharing practices with all relevant stakeholders across academia, industry, public authorities, citizens’ groups, non-governmental organisations, and society at large.
- Support widespread stakeholder participation in knowledge-sharing to increase trust in science.
- Contribute to the growth of Europe’s community of digitally empowered citizens.
- Design appropriate rules, internal procedures, and strategies to enable the NEOLAIa alliance to understand and implement Open Science principles and practices. (T8.1)
- Develop and sustain a NEOLAIa Open Science Policy that will be embraced by all alliance partners and stimulated through training, dissemination, and exploitation activities. (T8.1)

- Ensure that data on research results is fed into this WP so that open science is connected to concrete research activities throughout the NEOLAIa alliance, by working closely with WP5 Research Excellence and Regional Impact through joint remote annual meetings. (T8.2)
- Engage and stimulate all partners in co-creating Open Data on their teaching and research activities, by collaborating with citizens and citizens' groups. (T8.2)

The specific objectives of this package are 3:

1) Developing and sustaining the NEOLAIa Open Science Policy:

The NEOLAIa Open Science Policy will be developed in alignment with national and European policies, aiming to facilitate collaboration among alliance members, enabling open dissemination of research results to become available to the public without any restrictions.

2) Setting up, developing and Managing the Infrastructure for NEOLAIa Open Science

NEOLAIa partners are committed to a sustainable digital transformation through Open Science as part of the key NEOLAIa Pillar 1— Digital Transformation (one of the 3 key NEOLAIa Pillars) and WP9— Digital Transformation). In this task, the necessary infrastructure to provide Open Science access to all NEOLAIa activities will be set up and developed. The infrastructure will include:

- A public repository for all the scientific results by NEOLAIa researchers;
- A public open dataset server that performs harvesting and collection of open data on the NEOLAIa universities and their activities (based on CKAN open source).

3) Collaborative Building of Open Data and Open Data User experience boosted by AI.

The purpose is to augment the open data collected and harvested by the partners, through new, jointly authored and collaboratively created datasets by the NEOLAIa community (including researchers, staff, students, and citizens).

Thus, achievement of objectives will help the project to reach the overall goals in alignment with the national and EU policies, focused on digital transformation and digital empowerment of citizens.

The present **Deliverable 8.1**, titled **"Initial Report on the NEOLAIa Open Science Policy,"** provides a foundational overview of the strategies and measures being implemented to integrate Open Science principles across the NEOLAIa consortium. D8.1 reflects the collaborative input of all partner institutions but also serves as a testament to NEOLAIa's commitment to the principles of openness, transparency, and cooperation in scientific research – whenever applicable. It is designed to set the stage for ongoing efforts to foster an environment where scientific knowledge and data are freely shared and where innovation is nurtured through inclusivity and collaboration.

As Open Science becomes increasingly integral to the European research agenda, NEOLAIa aims to be at the forefront of this transformation by fostering principles of openness, accessibility, interoperability, and reusability of scientific data and publications.

4. Executive summary/abstract

D8.1, titled "Initial Report on the NEOLAIa Open Science Policy," sets the stage with an introduction to NEOLAIa's goals and frameworks and distils the essence of **Open Science and Citizen Science** in the context of the Alliance.

Significant emphasis is placed on **global Open Science initiatives**, demonstrating NEOLAIa's alignment with international standards and practices, and underscoring the alliance's commitment to a collaborative and transparent research environment. The methodology adopted for implementing the Open Science policy, dubbed the **NEOL Approach (NEOL)**, navigates through assessment, engagement, outlining strategic objectives, and launching initiatives to foster a sustainable Open Science culture across NEOLAIa universities.

A comprehensive **review of the current Open Science policies at NEOLAIa universities** highlights varying levels of adoption and points towards areas for development to achieve uniformity and compliance with overarching European directives. **Comparative insights from other alliances** illustrate diverse strategies and common challenges in Open Science implementation, providing a broader perspective and potential lessons for NEOLAIa.

The **main pillars of the NEOLAIa Open Science Policy are articulated**, emphasizing the alliance's strategic actions, including fostering citizen engagement, promoting FAIR principles, and ensuring that Open Science practices are integral to research activities across the consortium.

The **Deliverable 8.1 "Initial Report on the NEOLAIa Open Science Policy"** serves as the first document to outline the adoption and implementation strategies of Open Science within the NEOLAIa alliance.

5. Description

5.1 Definition of Open Science¹

Open Science represents a progressive approach to research, characterized by its emphasis on openness and collaboration in the scientific community. Central to this concept is the idea of sharing knowledge, results, and tools as promptly and broadly as possible, a practice that is compulsory under the Horizon Europe framework. This framework operates under the guiding principle of being "**as open as possible, as closed as necessary.**" This means that while the default approach is to **make research results and data openly accessible, exceptions are allowed to protect legitimate interests such as commercial**

¹ https://rea.ec.europa.eu/open-science_en#:~:text=Open%20science%20is%20an%20approach,%2C%20as%20closed%20as%20necessary, accessed on 11 April 2024

exploitation or compliance with legal obligations like data protection, which may necessitate some restrictions on accessibility.

The ethos of Open Science is further reinforced through the practice of open access, which ensures that scientific publications and research data are freely available online without charge and are reusable. While Horizon Europe does not mandate researchers to publish their findings, it stipulates that any published results should be accessible openly. Additionally, open access to research data is crucial, enabling the use of data collected for scientific analysis to be freely accessed and reused under specific conditions laid out in funding agreements. An example of this is the European Genome-Phenome Archive (EGA), which provides a resource ensuring that genomic and phenotypic data are findable, accessible, interoperable, and reusable. This approach aims to uphold the FAIR principles, ensuring that data is findable, accessible, interoperable, and reusable.

The benefits of Open Science are manifold, promoting enhanced collaboration across various sectors including academia, industry, and public authorities, while fostering greater creativity and trust in scientific outcomes. This collaborative environment not only increases the transparency and potential impact of research but also enhances the efficiency of research processes and fosters global scientific cooperation. An example of a collaborative project facilitated by Open Science practices is the Innovative Medicines Initiative (IMI) in Europe, which pools resources and data from public and private sectors to drive drug development processes. Programs like Horizon Europe and Erasmus+ champion this inclusive and transparent approach by mandating certain practices such as open access to publications and data, while recommending other practices like involving diverse knowledge actors, early sharing of research, and conducting open peer reviews to further enrich the research ecosystem.

5.2 Definition of Citizen Science

The European Commission defines Citizen Science as *“the voluntary participation of non-professional scientists in research and innovation at different stages of the process and at different levels of engagement, from shaping research agendas and policies, to gathering, processing and analysing data, and assessing the outcomes of research.”*²

Citizen Science can:

- Engage citizens and society to boost research relevance and align it with societal needs and values.
- Expand collective research capabilities, enhancing creativity, and improving data quality and quantity.
- Increase transparency, boost public science literacy, and strengthen confidence in research.

² <https://op.europa.eu/en/publication-detail/-/publication/d1768147-f17a-11ea-991b-01aa75ed71a1/language-en/format-PDF/source-152465380>, accessed on 28 March 2024

Citizen science is one of the 8 pillars of Open Science (European Commission 2019³). It is a concept that can be applied to different contexts and disciplines. It refers to scientific activities in which ordinary citizens participate, in collaboration with each other or under the guidance of professionals in the field. The disciplines in which citizen science is most widespread as presented in the following figure (2017 data⁴) are:

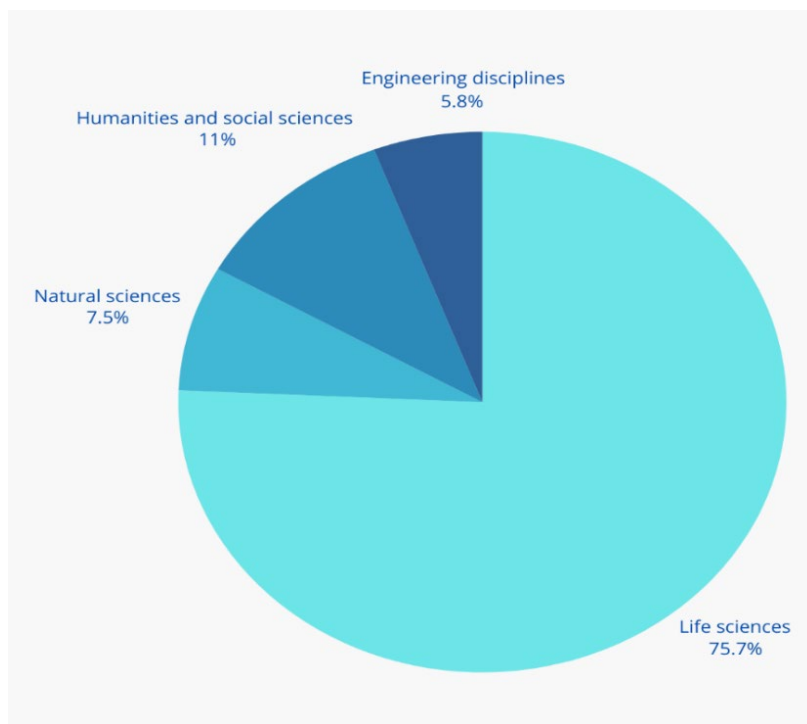


Figure 1 - Citizen Science Disciplines

In 2014, the European Citizen Science Association (ECSA) was founded, a Berlin-based association that aims, among other things, to build a bridge between citizens and science. ECSA also developed the Ten Principles of Citizen Science⁵.

1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.
2. Citizen science projects have a genuine science outcome: for example, answering a research question or informing conservation action, management decisions or environmental policy.
3. Both the professional scientists and the citizen scientists benefit from taking part. Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social

³ https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en accessed on April 12th, 2024

⁴ Hecker S., Garbe L., Bonn A. (2018), *The European citizen science landscape – a snapshot*, in Hecker S., Haklay M., Bowser A., Makuch Z., Vogel J., Bonn A. (eds.), *Citizen Science - Innovation in Open Science, Society and Policy*, pp. 190-200. UCL Press. (https://www.istor.org/stable/pdf/j.ctv550cf2.20.pdf?refreqid=fastly-default%3A5e259620c15f53dede330e2fb1b596c0&ab_segments=&origin=&initiator=&acceptTC=1)

⁵ <https://zenodo.org/records/5127534#.YPrkNEBCRhE>

benefits, satisfaction through contributing to scientific evidence e.g. to address local, national, and international issues, and through that, the potential to influence policy.

4. Citizen scientists may, if they wish, participate in multiple stages of the scientific process. This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
5. Citizen scientists receive feedback from the project. For example, how their data are being used and what the research, policy or societal outcomes are.
6. Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for. However, unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
7. Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format. Data sharing may occur during or after the project unless there are security or privacy concerns that prevent this.
8. Citizen scientists are acknowledged in project results and publications.
9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.
10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.

The ECSA portal (<https://www.ecsa.ngo/>) also collects a list of projects that provide descriptive metadata, the DOI and the guidance needed to make project data openly accessible in line with the FAIR principles.

5.3 Global Open Science Initiatives

The EU's open science policy⁶

According to the European Commission, Open Science represents a transformative shift in how science is conducted, promoting openness and collaboration in the generation, and sharing of knowledge and data right from the early stages of research. This approach influences research institutions and scientific practices, introducing new models for funding, evaluating, and rewarding researchers. It enhances science's quality and impact by encouraging reproducibility and cross-disciplinary work and increases efficiency and reliability through improved resource sharing and verification processes, ensuring that scientific endeavours are more aligned with societal needs.

The EU's Open Science policy is defined by eight key goals, including making research data findable, accessible, interoperable, and reusable (FAIR), and establishing a European Open Science Cloud for shared research data. It also aims to create new metrics for assessing research, ensure free access to

⁶ https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en, accessed on 28 March 2024

peer-reviewed publications, recognize open science in career evaluations, uphold research integrity, equip scientists with necessary open science skills, and engage the public in scientific research.

Amsterdam Call for Actions on Open Science⁷

The Amsterdam Call for Action on Open Science is a directive aimed at transforming scientific and research practices to better align with the principles of open access and collaboration. This call was made during the conference on 'Open Science – From Vision to Action', organized under the auspices of the Netherlands' EU Presidency in April 2016. The call emphasises the urgency of transitioning towards open science, noting that despite numerous initiatives, the broad adoption of open science practices is still lagging. The goal is to **make scientific research and results more accessible**, thereby increasing the rate of scientific innovation and its societal benefits. This includes pushing for open access to all scientific publications and advocating for a fundamentally new approach toward the optimal reuse of research data by 2020.

The action plan includes twelve strategic actions centred around five main themes. These actions are designed to address various barriers within the current research and publication landscape, such as outdated assessment and reward systems, restrictions on data mining, and lack of transparency in publication costs. Specifically, the Amsterdam Call for Action proposes changes to ensure that research data and outputs are openly accessible and reusable in line with FAIR principles—Findable, Accessible, Interoperable, and Reusable. It also calls for the implementation of new evaluation systems that reward open science practices, aligning policies across Europe to foster a coherent open science environment.

The Amsterdam Call for Action is not just a framework for advancing open science but also a commitment to continuous improvement and evaluation of its implementation. It stresses the need for a unified approach across member states and stakeholders to create a sustainable and inclusive open science ecosystem. By fostering greater transparency, removing barriers to data sharing, and promoting new forms of scientific communication and collaboration, the Call aims to enhance the impact of science on society and the economy, ensuring that Europe remains at the forefront of global research and innovation.

UNESCO Recommendation on Open science

The UNESCO Recommendation on Open Science, adopted in November 2021, **establishes a crucial international normative framework that underscores the vital role of open scientific practices in addressing global challenges such as climate change, health crises, and sustainable development**. This recommendation aims to **democratize access to scientific information and data**, fostering a more inclusive global scientific community that can accelerate progress toward achieving the United Nations Sustainable Development Goals. By promoting open science, UNESCO aims to **reduce inequalities** within and among countries, **enhance the quality and impact of scientific research**, and ensure that the benefits

⁷ <https://www.openaccess.nl/sites/www.openaccess.nl/files/documenten/amsterdam-call-for-action-on-open-science.pdf>, accessed on 11 April 2024

of scientific advancements are accessible to all segments of society, especially those in less developed and underserved regions.

The recommendation delineates seven key areas of action for its implementation, including promoting a common understanding of open science, developing enabling policies, investing in open science infrastructure, and enhancing training and education to broaden participation in scientific processes. It also emphasizes fostering a culture that aligns with open science principles, innovating scientific processes through openness, and strengthening international cooperation on open science initiatives. These actions are designed to ensure that open science practices become integral to the research and innovation ecosystems, enhancing transparency, collaboration, and reproducibility of scientific research.

UNESCO's framework also advocates for integrating open science into national policies and educational systems to create an environment where scientific research and data are openly shared. This includes developing supportive legal and policy frameworks, improving digital literacy, and ensuring that investments in science and technology promote public access to scientific knowledge. Through these measures, UNESCO aims to empower researchers and the public by facilitating the free exchange of knowledge and collaboration, thus fostering more resilient and informed societies equipped to tackle the pressing issues of our time.⁸

UNESCO Definition of Open Science is often compared^{9,10} to an umbrella term 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 benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.

The umbrella of Open Science depicts three pillars: Open Access, Open Data and Citizen Science, with the conjugation of these actions in good practices. The UNESCO vision is particularly relevant for NEOLAiA as the work planned in WP8 all fit within these three pillars, illustrated in the picture below:

⁸ <https://www.unesco.org/en/open-science>, accessed on April 11, 2024

⁹ Maedche, A, Elshan, E, Höhle, H, Lehrer, C, Recker, J, Sunyaev, A, Sturm, B & Werth, O 2024, 'Open Science: Towards Greater Transparency and Openness in Science', Business & Information Systems Engineering. <https://doi.org/10.1007/s12599-024-00858-7>

¹⁰ Katherin Wagenknecht, Tim Woods, Francisco García Sanz, Margaret Gold, Anne Bowser, Simone Rüfenacht, Luigi Ceccaroni, Jaime Piera; EU-Citizen.Science: A Platform for Mainstreaming Citizen Science and Open Science in Europe. Data Intelligence 2021; 3 (1): 136–149. doi: https://doi.org/10.1162/dint_a_00085

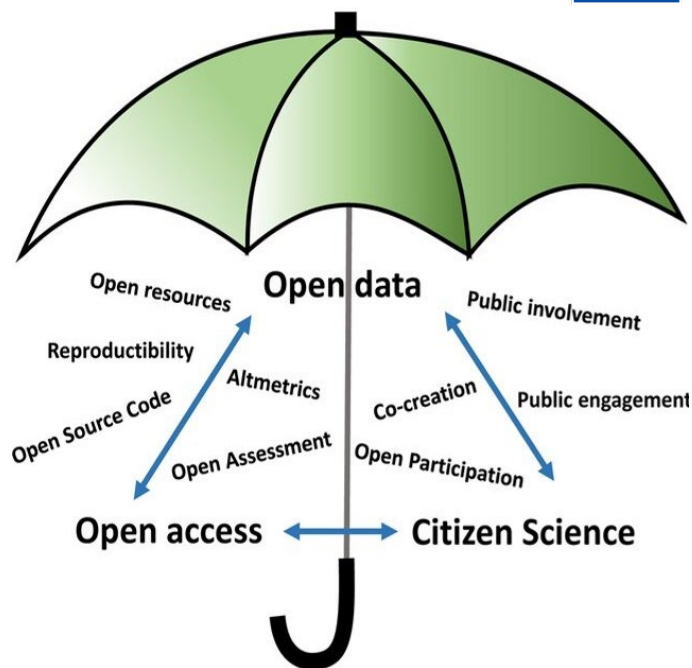


Figure 2 – Open Data – Open Access – Citizen Science under the UNESCO Open Science umbrella. Image by Lotta Tomasson, VA CC BY-NCE 2.0, [When et al. (2020)]

The Berlin Declaration on Open Science to Knowledge in the Sciences and Humanities

The Berlin Declaration of 2003 also strives to spread knowledge globally, by making it widely available to the public. The aim of the Berlin Declaration is to establish a maintainable, cooperative, and transparent environment on the World Wide Web, as well as create material and software apparatuses, which will be publicly available and attuned. It sets the guidelines that provide users with free-of-charge, global, and irreversible authority to access scientific/academic work. Furthermore, it grants a permit to utilize and disseminate scientific/academic work openly, only if it is accompanied with a consent form that authorizes the aforesaid activities¹¹.

Coalition for Advancing Research Assessment (CoARA)

The Coalition for Advancing Research Assessment (CoARA) were initiated in 2022 and is a European version of the San Francisco Declaration on Research Assessment (DORA) from 2013. These initiatives are both aimed at developing and promoting new practices to assess research and researchers.

CoARA consists of 10 different commitments to abide to reform the landscape of research assessment. The focus is that the assessment should recognize the diversity of contributions within different research areas and that it should be more qualitative evaluations with peer review, but still be supported by responsibly used quantitative metrics. It also includes new types of methods of assessment of research and raise awareness of the reform of research assessment. Finally, it states that these new types of research assessments practices, criteria and tools should be evidence based and the corresponding data should be openly available for future and further research of research assessments. This will also include

¹¹ <https://openaccess.mpg.de/Berlin-Declaration>, accessed on 15 April 2024

collaboration to develop new practices, sharing of experiences and training other universities in these areas.

Taken together, this would provide opportunities to develop new types of assessment practices for research outputs outside the traditional research assessment and improve career opportunities for researchers. It will be a catalyst for Open Science Practices as a natural part of the assessment process.

5.4 Methodology Approach Towards the NEOLAIa Open Science Policy (NEOL)

The NEOLAIa Alliance is pioneering a methodical progression towards Open Science, captured in the **NEOL (Navigate, Engage, Outline, Launch) Approach**.

Navigate (N): The journey begins with a comprehensive assessment of the existing Open Science framework within the NEOLAIa network. This foundational step involves identifying the current practices, policies, and any barriers that might impede the integration of Open Science. In parallel, there's a conscious effort to explore global Open Science trends, standards, and best practices. This exploration is crucial as it provides insights into potential pathways and innovations that can be adapted and adopted within NEOLAIa's unique context.

Engage (E): The Alliance believes in the power of inclusive dialogue. Hence, the engagement phase involves reaching out to a broad spectrum of stakeholders within the NEOLAIa community to gather diverse perspectives on Open Science. The aim here is to establish a participatory platform that facilitates continuous dialogue, feedback, and the co-creation of Open Science policies and practices, ensuring that the voices of all participants are heard and valued.

Outline (O): With insights gained from thorough navigation and comprehensive engagement, the Alliance proceeds to develop a clear and actionable Open Science framework. This framework is tailored to align with NEOLAIa's ambitions and encompasses strategic objectives and key action areas such as open access publishing, data sharing, and research integrity. It also includes defined implementation timelines that align with NEOLAIa's broader mission and values, thus ensuring coherence and relevance across the network.

Launch (L): The final phase of the approach is the launch, a crucial step where initiatives are put into action to test and refine the Open Science strategies. This phase builds on the collaborative energy and ideas emanating from the engagement phase. It includes implementing targeted education and training programs aimed at enhancing Open Science capabilities and awareness throughout the NEOLAIa network. Moreover, there is a strong focus on promoting, when possible, the Open Science policy and its initiatives, both internally within the NEOLAIa community, and externally.

The NEOLAIa Alliance's adoption of the NEOL Approach signifies its commitment to shaping a resilient and dynamic Open Science ecosystem that resonates with the values of collaboration, transparency, and shared knowledge.

5.5 NEOLAIa Universities Open Science Policies Status

In analysing the Open Science policies of partner institutions within the NEOLAIa network, several areas for improvement across the partner institutions have been identified:

- **Consistency and Universality:** While the adoption of Open Science practices is evident, the depth and implementation of these practices vary significantly among universities. A more unified and consistent approach could bolster collaborative efforts and have a greater impact. The NEOLAIa-wide Open Science Policy could serve as a standardizing framework.
- **Open Educational Resources (OER):** Although OERs are recognised and promoted, not all institutions have established formal policies or dedicated repositories. The development of such policies and infrastructures would further endorse and consolidate both individual and institutional Open Science initiatives.
- **Infrastructure for Research Data:** The availability and uniformity of institutional research data repositories vary. The establishment of such repositories, aligned with the FAIR (Findable, Accessible, Interoperable, Reusable) principles, would enhance data sharing and usability.
- **National Open Science Plans:** There is an uneven distribution of National Open Science Plans across the alliance. Countries within the alliance that have published National Open Science Plans are at an advantage. The accelerated development of such plans could create a more defined national framework for universities to align their policies, fostering greater coherence and collaboration.

The NEOLAIa Alliance has the potential to spearhead a more cohesive and robust Open Science ecosystem by addressing these areas for improvement and ensuring a harmonized adoption of Open Science standards and practices.

Below we present the Universities involved in the project, as well as the national policies regarding Open Science, for the countries where they are established.

University of Nicosia

The National Policy of the Republic of Cyprus for Open Access to Scientific Research

The application of the Open Access Policy adheres to the National Policy of the Republic of Cyprus for Open Access to Scientific Research, as well as corresponds to the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. The Cyprus National Policy is affiliated with the existing provisions and implementations of the Horizon 2020 and Horizon Europe agendas, which falls under the European Union's Research and Innovation framework programme for the period ranging from 2014 to 2027. It is built upon the Open Access strategies established by the UNESCO policy; whilst also being heavily inspired by both- the PASTEUR4OA as well as the MEdOANet projects that also concern the policy on Open Access. In addition, it derives further inspiration from the existing EU and global policies, meanwhile correspondingly considering the suggestions enlisted within the RECODE project, regarding the Open Access Policy. However, it is also important to note the importance that the maintenance and utilization application— that are actively encouraged by OpenAIRE, a Pan-European programme that aims to transfer academic dissemination to a state of frankness as well as transparency whilst also enabling pioneering methods of communication and overseeing of research — have on this National

Policy on the Open Access Policy. With the aforementioned information taken into consideration, the National Policy offers a framework — alongside wide-ranging enactment provisions and procedures— which in turn will assist research sponsors as well as research participants, to adopt the policies for the National Open Access agenda.

The **University of Nicosia** has started designing its Open Access Policy as a comprehensive framework aiming to enhance the visibility, accessibility, and impact of scientific research. By embracing open access, the university aims to democratize knowledge, fostering a more inclusive and collaborative academic environment. The University of Nicosia has not fully adopted or implemented the policy yet, as it has not been finalized. However, here's a breakdown of the key elements and benefits of the suggested policy:

- **Increased Research Impact:** The policy facilitates wider dissemination of research, making it more accessible to a broader audience, including academics, industry professionals, and the public. This increased visibility can lead to higher citation rates and greater academic recognition.
- **Organized Preservation and Accessibility:** Research outputs are systematically collected, preserved, and categorized, simplifying the process for readers to find and utilize scientific work.
- **Enhanced Monitoring Tools:** The policy provides researchers with tools to track how their work is being used, offering insights into the impact of their research.
- **Opportunities for Collaboration and Funding:** Open access to research broadens the scope for partnerships and funding by making it easier for potential collaborators and sponsors to find and evaluate relevant projects.
- **Reduced Access Barriers:** Lower subscription costs and the elimination of paywalls mean that more people can access high-quality academic work, enriching public knowledge and fostering educational growth.

Permanent Accessibility: Each project is assigned a permanent internet link, enhancing the discoverability of researchers' work.

Policy Scope and Exceptions: The policy applies to all research outputs from the University of Nicosia, including peer-reviewed articles and conference proceedings. Exceptions include research involving patents, sensitive personal data, and matters of security and privacy.

Roles and Responsibilities for Researchers:

- **Submission to Repository:** Researchers are encouraged to submit their publications and associated metadata to the University of Nicosia's Repository.
- **Compliance** with publisher embargo periods is required, not exceeding 12 months for peer-reviewed articles.
- **Intellectual Property:** Researchers are advised to retain certain rights and utilize European Commission documents for Intellectual Property Rights preservation.
- **Use of Identifiers:** Adoption of ORCID and DOI identifiers is recommended to distinguish researchers' works.

- **Research Data Deposits:** Researchers are encouraged to deposit supporting research data sets in the Institutional Repository, adhering to personal data protection regulations.

For the University:

- **Infrastructure Development:** The university is responsible for providing an electronic infrastructure and creating an Open Access Institutional Repository compatible with European OPENAIRE standards.
- **Support and Training:** Offering guidance and training for repository use and metadata submission is crucial.
- **Creative Commons Licensing:** Informing researchers about the benefits and use of Creative Commons Licenses is essential.
- **Policy Implementation and Monitoring:** The university is tasked with implementing and monitoring the Open Access Policy, aligning it with national and international open access standards.

University of Salerno

Italian National Plan for Open Science (PNSA)

The Italian National Plan for Open Science (PNSA) constitutes a significant initiative aligned with both European directives and national regulations, promoting transparency and open access in scientific research. It reflects the concrete commitment of the Italian government to adhere to the principles outlined in the Directive 2019/1024/EU of the European Parliament and of the Council of 20 June 2019 on open data and the reuse of public sector information, as well as to promote the sharing and dissemination of scientific knowledge, as also emphasized in the Law of 9 January 2019, No. 4 "Provisions for the protection and enhancement of Italian scientific and technological research work and for the adoption of the principle of open access." The primary goal of the Italian National Plan for Open Science (PNSA) is to foster an ethos of open science, encouraging collaboration and knowledge sharing among researchers, academic institutions, government bodies, and civil society. This aims to enhance access to research findings, scientific data, publications, and educational materials, thereby facilitating greater participation in the generation of knowledge.

The PNSA's implementation strategies involve specific actions designed to support and promote open science across various fronts, aligning with both European directives and Italian laws. These actions include the adoption of institutional policies favouring open access, the establishment of platforms for sharing research data, promoting publication in open-access journals, and developing educational resources on open science.

Active engagement of stakeholders such as researchers, academic institutions, publishers, NGOs, and the public is essential for the plan's success. Collaboration among these groups is crucial for effective implementation.

Additionally, the PNSA incorporates monitoring and evaluation mechanisms to track the adoption of open practices and address any challenges. This ensures compliance with European and national regulations and meets the needs of the scientific community and society at large.

The Italian National Plan for Open Science underscores Italy's commitment to transparency, open access, and collaboration in scientific research. This commitment, aligned with European and national regulations, aims to enhance research quality, and maximize the dissemination of scientific knowledge for the benefit of society.

The University of Salerno follows the directives of the PNSA and, in accordance with it, has produced its own policy for the publication and accessibility of data and publications through an open access regulation.

UNISA Open Access Regulation

The Open Access Regulation of the University of Salerno (UNISA) establishes guidelines and procedures to promote and regulate open access to the institution's scientific and academic output.

This regulation:

- Implements the EU Commission Recommendation of July 17, 2012, on access to and preservation of scientific information (2012/417/EU) in OJEU L. 194/39 of July 21, 2012.
- Implements Article 4, paragraphs 2, 3, and 4, of Law No. 112 of October 7, 2013, in OJ No. 236 of October 8, 2013, which converted with amendments Decree Law No. 91 of August 8, 2013.
- Implements the EU Commission Recommendation of April 25, 2018, on access to and preservation of scientific information (2018/790/EU) in OJEU L. 134/12 of May 31, 2018.
- Incorporates recommendations from the Commission on Libraries— Open Access Group of the Conference of Italian University Rectors (CRUI).
- Facilitates compliance with open access obligations stipulated by research funding programs of the European Commission and the Italian Ministry of Education, University, and Research (MUR).

Its main features include:

- **Objectives:** The regulation aims to promote the dissemination of scientific knowledge by increasing accessibility to research outcomes produced by the university.
- **Scope:** It governs the archiving and dissemination of scientific research outcomes, ensuring they are accessible to all, reducing economic barriers, and promoting data sharing and reuse.
- **Applicability:** The regulation applies to all university members, including faculty, researchers, and students, as well as all research outcomes produced within the institution.
- **Deposit Requirements:** The regulation establishes requirements and procedures for depositing scientific materials in institutional archives, ensuring compliance with national and international open access standards.
- **Licenses and Copyright:** It regulates licenses and copyright associated with deposited materials, ensuring they are adequately protected while guaranteeing user freedom of access and use.

Role of Institutional Repository: The regulation specifies the role and responsibilities of the institutional repository in implementing and enforcing open access policies, including managing deposited materials and promoting their visibility and accessibility.

Policy Scope

The policy applies to all research outputs from the University of Salerno, including peer-reviewed articles and conference proceedings.

Roles and Responsibilities of Researchers:

- **Submission to Repository:** The University utilizes its institutional repository, IRIS UNISA, for implementing the regulation. Repository deposit ensures the long-term preservation of the university's scientific output and makes it available.
- **Embargo Periods:** An embargo is the period during which open access to the contribution is suspended, even if it is already deposited in the Institutional Repository. Researchers are encouraged to verify, before submitting the product to a journal or other publishing venue, the conditions provided by the publisher regarding distribution terms, to publish openly or with a reserved embargo in the Institutional Repository at least the refereed digital version (post-print) of the product. The Commission delegates the task of evaluating requests to the competent office based on periodically formulated general guidelines and establishes the terms of the embargo itself.
- **Intellectual Property:** Researchers are advised to retain certain rights and utilize European Commission documents for Intellectual Property Rights preservation.
- **Use of Identifiers:** Based on the book's ISSN, adoption of ORCID and DOI identifiers is optional to distinguish researchers' works.
- **Research Data Deposits:** The University expects every researcher to deposit research data in the open-access institutional repository at the time of publication.
- **Infrastructure Development:** The University is responsible for providing an electronic infrastructure (IRIS) and creating an Open Access Institutional Repository compatible with best practices and international technical standards for open access and long-term preservation of contributions.
- **Support and Training:** The University organizes periodic training initiatives on open access for authors, as well as public events such as conferences and seminars to raise awareness of open access principles and best practices. In order to pursue the goals of open access and facilitate its dissemination, the University has established a University Commission and a working group that provide assistance to authors in copyright management aimed at Open Access or free access to the Institutional Repository. A Guide for copyright management aimed at Open Access is being prepared.
- **Creative Commons Licensing:** Informing researchers about the benefits and use of Creative Commons Licenses is essential.
- **Policy Implementation and Monitoring:** The University Commission, composed of the two research delegates, the President of the Board of Directors, and the President of the Board of

Directors Technical-Scientific Committee, defines and proposes to the competent statutory bodies the policies for implementing the principle of open access, reviews, and updates this regulation.

University of Jaén

The Spanish National Open Science Strategy 2023-2027

Mission: The Spanish National Open Science Strategy (ENCA) has the mission of strengthening the quality, transparency, and reproducibility of scientific activity in Spain, improving dissemination among the scientific community and knowledge transfer to society, and designing how Spain responds to the challenges faced by the Spanish scientific community in this new global paradigm.

Vision: Through the ENCA, the aim is to ensure that by 2027 the funding, execution, communication, and assessment processes of scientific research in Spain incorporate the principles of open science. The ENCA will provide support for the preparation of the upcoming State Plan for Science, Technology, and Innovation 2024-2027 to be aligned with national, European, and international policies on open science.

The ENCA 2023-2027 is based on all previous commitments related to open science adopted by different agents in the system, including those contained in Law 17/2022, in Organic Law 2/2023 on the University System (LOSU), in the Spanish Science, Technology, and Innovation Strategy 2021-2027, and in the State Scientific, Technical, and Innovation Research Plan 2021-2023. The Strategy has **4 main objectives**:

1. Ensure the existence of sufficiently robust and well-articulated interoperable digital infrastructures capable of absorbing the impact of implementing a national open science policy and facilitating its integration into the international ecosystem, including, where applicable, the European Open Science Cloud (EOSC).
2. Promote the proper management of research data generated by the national R&I system through the FAIR principles (Findable, Accessible, Interoperable, Reusable).
3. Implement open and free access by default to publications and scientific results directly or indirectly funded with public funds, for the entire population.
4. Establish new research assessment mechanisms and a system of incentives and recognition aimed at promoting open science practices, as well as providing training to all personnel (researchers, managers, funders, evaluators) to align their professional performance with the principles of open science.

Support to Open Access at the University of Jaén

The University of Jaén does not have a formally written Open Science or Open Access Policy. However, several services support Open Access:

- Open Access Institutional Repository, named RUJA. URL: <https://ruja.ujaen.es/>

- Current Research Information System (CRIS), named Portal de la Investigación (Research Portal). URL: <https://investigacion.ujaen.es/>
- Transformative agreements for Article Processing Charges (APCs).
- Open Access Journals.
- **Support and Training.** The University of Jaén offers guidance and training for repository use and metadata submission. Also, it offers personalized assistance for creating and maintaining identifiers such as ORCID.

Creative Commons Licensing: Informing researchers about the benefits and use of Creative Commons Licenses.

Roles and Responsibilities for Researchers:

- **Submission to Repository:** Researchers are encouraged to submit their publications and associated metadata to the University of Jaén's Repository. Publication in open institutional repositories is compulsory for researchers that get funding from the national research programmes. Also, PhD thesis must be deposited in the institutional repository.
- **Embargo Periods:** Compliance with publisher embargo periods is required, not exceeding 12 months for peer-reviewed articles.
- **Intellectual Property:** Researchers are advised to retain certain rights and utilize European Commission documents for Intellectual Property Rights preservation.
- **Use of Identifiers:** Adoption of ORCID and DOI identifiers is recommended to distinguish researchers' works.

Research Data Deposits: Researchers are encouraged to deposit supporting research data sets in the Institutional Repository, adhering to personal data protection regulations.

University of Tours The French national strategy on open science is formalized since 2018 in **French Plan for Open Science.**, and University of Tours has adopted an open science charter that closely follows the structure, aims and scope of this national strategy.

University of Tours' charter for open science

Open science is an international movement which aims to make scientific research and its data accessible to everyone, at all levels of society. It draws on the opportunity provided by recent digital progress to facilitate and develop open access to publications, research methods and source codes, and – as much as possible – to research data, in compliance with the principle “as open as possible, as closed as necessary.”

In accordance with legal and regulatory framework:

- French Digital Republic Act (2016)
- National Plans for Open Science (2018 and 2021)
- Decree No. 2021-1572 of December 3, 2021, on Scientific Integrity,

and in consistency with research funders' requirements (European Commission, French National

Research Agency), the University of Tours hereby formalizes its open science policy and strategy taking on the following commitments.

Pillar 1: Opening access to scientific publications

The University of Tours aims to disseminate all its publications in open access. The national platform HAL (Hyper Article en Ligne) is designed as the institutional repository to ensure international visibility and long-term preservation of its publications. The University of Tours' researchers are required to deposit their publications in full text on the dedicated HAL portal, in accordance with regulatory framework. The University of Tours recommends publishing in natively open access journals. It strongly advises against paying APCs (Articles Processing Charges) for open access publications in hybrid journals. Indeed, it is possible to give open access to a publication by depositing the post-print in HAL. To preserve authors' copyrights, the University of Tours advises against depositing full texts on academic social networks. If used wisely those could be used only as communication tools. It is then possible to refer to the publication on social networks by linking to the version deposited in HAL.

Pillar 2: Managing and sharing research data

The University of Tours aims to publish its research data in open and certified repositories. The University of Tours promote the share of projects' research data, in compliance with regulations (especially GDPR, intellectual property code), ethics and contractual commitments that are applicable to said data.

The University of Tours supports its research teams in writing Data Management Plans following FAIR principles (Findable, Accessible, Interoperable, Reusable). The Data Management Plan is a document that outlines how data will be handled during and after a research project. The university also implements a strategy to secure storage of research data on server(s) in accordance with its Information Systems Security Policy.

Pillar 3: Opening software source code

The University of Tours aims to promote the provision of software source code resulting from research work, with the possibility of disseminating, reusing, and modifying them to facilitate the reproducibility of scientific results, while respecting the principle "as open as possible, as closed as necessary." The University of Tours supports its research teams in disseminating software source code and choosing appropriate licenses, while respecting legal and contractual requirements.

Pillar 4: Making open science the default principle

The University of Tours aims to promote an open science and to value the diversity of its scientific productions and dissemination. The university defends the recognition of open science in research assessment. It raises awareness and trains its research teams in open science.

Bielefeld University

Compared to France, for example, Germany does not have a national open science plan or a national open science strategy. One of the main reasons for this is the federal organisation of the education system in Germany and the differentiation between university and non-university research institutions. The Federal Ministry of Education and Research published its own open access strategy in 2016 and called on the federal states to develop corresponding strategies for their universities. The federal state of North Rhine-Westphalia, which is home to Bielefeld University, published a state-wide Open Access Strategy in 2023, which is to be further developed into an Open Science Strategy. Non-university research institutions such as the Helmholtz Association replaced their Open Access Strategy from 2016 with an Open Science Strategy in 2022.

Regarding the various pillars of Open Science, the situation at Bielefeld University is as follows:

Pillar 1—Open Access: Adoption of an Open Access Policy in 2005. Implementation is supported by a range of services (repository, Open Access publication fund, platform for publishing own Open Access journals, university press).

Pillar 2—Research data: Bielefeld University published a policy on handling research data in 2011 and reinforced it with a resolution on research data management in 2013. Implementation is supported by the Research Data Competence Centre at Bielefeld University.

Pillar 3—Opening software source code: Bielefeld University Library is running a central GitLab system as a collaborative development environment for all researchers at Bielefeld University.

Pillar 4 – OER: The adoption of an OER policy for Bielefeld University is currently being prepared.

An Open Science Network exists at Bielefeld University since 2021, which is supported by researchers from various faculties, the University Library, and the Bielefeld Centre for Data Science. Within the network, researchers exchange experiences, practices, resources, and tools. Members of the OSN are currently preparing an interdisciplinary course on Open Science.

Örebro University

National guidelines focusing on Open Science in Sweden

Swedish research bill 2020

From this Research Bill of 2020/21, the Swedish Government states the following about Open Science in Sweden: “In the national roadmap for the European research area in 2019, the Swedish approach to open access was clarified. It means that research products, as far as possible, must meet the FAIR principles and that scientific publications produced with public funds no later than 2020 should become openly available immediately when they are published. In line with the expected guidelines for open science in Horizon Europe and to speed up the transition to an open science system, the government sees a need to update the national direction for open science. This means a clarification that scientific publications, resulting from research financed with public funds, must be immediately openly accessible from 2021. Regarding research data, the transition must be fully implemented by 2026 at the latest, which means

research data must be made available as open as possible and limited, as necessary. [...] Several challenges have also been identified. It is important to follow up and measure the national work for an open science system in an integrated way. It is also of great importance that research funders' and universities' principles for open access to publications and research data are harmonized, as far as possible. To facilitate the openly accessible publication of scientific books, there is a special need for support from research funders and universities. Universities and research funders are also responsible for designing clear incentives promoting open science. To meet these various challenges and to speed up the transition to an open science system, the government intends to clarify existing coordination assignments to the Royal Library and the Swedish Research Council regarding open access."

National guidelines for Open Science

In addition to this the Royal Library has created the National Guidelines for Open Science to broaden the national approach of Open Science to also include Open Research Methods, Open Educational Resources, Citizen Science, and infrastructure to support Open Science. These additional areas have been set an aim of 2030 to coincide with AGENDA 2030 and SDGs. The National Guidelines of Open Science from the Royal Library will be revised every three years.

The association for Swedish Higher Education Institutions (SUHF): road map for open science

In this Road Map, SUHF is the Swedish Higher Education Institutions help to get a better understanding of their responsibilities and measures to reach the national research policies and guidelines for open science.

"The goal is to contribute to creating improved opportunities for the universities and other stakeholders to coordinate on issues of a common nature and encourage increased cooperation. It is important to jointly create conditions within the sector so that researchers at Swedish universities, regardless of university affiliation, have similar opportunities for services and support in an open science system."

This Road Map consists of 9 recommendations/responsibilities and is supported by a guidance for the Road Map.

The HEIs' responsibilities:

1. To create research and educational environments that support, encourage, inform, and educate about open science as a practice, by adopting, implementing, and anchoring local policy documents or frameworks.
2. to provide relevant research and education support services regarding open science, which can resource-efficiently meet researchers' needs for support throughout the research process, i.e. before, during and after a research project.
3. to actively work to create a sharing culture regarding educational resources by encouraging and promoting the creation, sharing and use of open learning resources.
4. to strive toward that research data and research results meet the FAIR principles as far as possible and are searchable, accessible, interoperable, and reusable.

5. to offer researchers affordable, adequate and secure infrastructural services— which comply with current regulations (especially the Freedom of the Press Ordinance, the Publicity and Privacy Act, the Archives Act and the GDPR) as well as the FAIR principles — for handling, storing, making available and preserving research data and research results where archiving and thinning are included as an integral part of the research process and open access work.
6. to actively collaborate with other universities, infrastructures, and financiers to find resource- and cost-effective, joint national solutions regarding governing documents, frameworks, and infrastructural services.
7. to promote, participate and collaborate with international actors and initiatives, for example within the Coalition for Advancing Research Assessment (CoARA), the European Open Science Cloud Association (EOSC-A) and The San Francisco Declaration on Research Assessment (DORA)
8. to develop an incentive structure that promotes, and values open science, for example in merit assessment and performance-based distribution of funds.
9. to act so that the copyright for publication and reuse of research results is not exclusively transferred to commercial scientific publishers.

Örebro University's policies connected to Open Science

Publishing with Open Access at Örebro University (revised 2024-03-05)

Örebro University's vision is *"An outstanding university —for knowledge-based social development"*. This includes, among other things, that research results are made available and communicated successfully to both the scientific community and the public.

In the research bill *"Research, freedom, future —knowledge and innovation for Sweden"* (prop 2020/21:60) the importance of high-quality Swedish research being published with open access is emphasized. The aim is for the research to be disseminated within the scientific community and to society in general to contribute to society's development. "The government therefore considers that scientific publications, which are the result of research financed with public funds, should be immediately openly accessible with effect from 2021." (prop 2020/21:60, p.16).

Most major Swedish and international research funders set some form of requirement for publication with immediate open access, this applies to both public and private funders.

Policy for publishing with Open Access at Örebro University

Örebro University's aim is that publications produced at the university should be published with open access. The policy is general, while conditions and practices may vary based on the publication traditions of different research disciplines.

- Scientific publications must be published with immediate open access to the greatest extent possible. This means that an article or book must be available in digital form without delay.

- Scientific publications that are not published with immediate open access must be deposited in the university's publication database DiVA, and published open access with as short a delay as possible.
- PhD students should publish doctoral and licentiate theses with open access in the publication database DiVA. Open access publication can only take place for those parts for which the author owns the copyright.
- Students must be informed about and given the opportunity to publish their degree project reports with open access in the DiVA publication database .

Research data policy for Örebro University

The research data policy is based on the Association of Swedish Higher Education Institutions' (SUHF's) recommendations and is a way of working towards open access of research results and research data at the university. Furthermore, it also addresses the responsibility of the university and the individual researcher regarding research data dissemination.

Örebro University supports national and international efforts to make research results and research data produced at the university as openly accessible. In accordance with the research bill from 2020, the goal is that research data from research conducted at Örebro University using public funding will be fully open access no later than 2026. The university also follows the national roadmap for Open Science, adopted by SUHF-associated institutions in 2021, and which aims to clarify the HEI's responsibilities.

The Swedish Research Council's definition of research data applies:

"Research data can be of many different types and formats, such as results from experiments and measurements, observations from field work, statistics, questionnaire responses, interviews, images, and text. [...] Within the framework of this assignment, the term research data is used in a broad sense, as digital information created or collected for analysis for research purposes."

Örebro University's aim is that research data, as far as possible, have to comply with the international FAIR principles – Findable, Accessible, Interoperable, and Reusable.

Consideration shall be given to current regulations and research ethics principles. In cases where research data cannot be made available for ethical or commercial reasons, metadata must be open access. Research data must be "as open as possible, as closed as necessary."

Proprietary rights

As the principal and authority responsible for archives, the university owns the primary data produced in research as a rule. With the support of the intellectual property rights of academic staff, researchers have the right to their research results, though in general, research data are not covered by this exemption.

Division of responsibility

The university's responsibility

1. Provide support to the researcher on following the research data policy, the research funding body's requirements, and any other recommendations regarding research data.
2. Ensure that there is a specially designated support function (Data Access Unit, DAU), which provides support in the processing, reviewing, and making available of research data and metadata based on FAIR principles, in accordance with existing agreements between the university and the Swedish National Data Service (SND)
3. Provide secure and appropriate technical solutions and services that make research data available and enable its storage and preservation.
4. Educate doctoral students and other employees in good research practices and procedures for handling research data and inform them about the support offered.

The researcher's/doctoral student's/ research team's responsibility

1. Follow the research data policy, the research funding body's requirements, and any other recommendations regarding research data.
2. Prepare a data management plan followed by their university, or the research funding body's requirements, at the outset of the research project.
3. Be familiar with current rules and regulations for research.
4. Inform partners about the university's research data policy and consider the requirement for making research data available in connection with the establishment of agreements with third parties.
5. Decide whether research data should be made available locally or via external research data repositories/catalogues.

Šiauliai State University of Applied Sciences

The National Guidelines for Open Access to Scientific Publications and Data (hereinafter – the Guidelines)

Open access to scientific publications

1. Open access to scientific publications shall be made available through repositories and/or open access journals.
2. All scientific publications of projects shall be cached and archived. Digital copies of publications must be submitted to the repository immediately after acceptance for publication. The repository shall assign an identifier to the submitted publications and shall immediately open their metadata. The metadata of publications must be fully open, searchable, and automatically retrievable, even when the scientific publication is under embargo.
3. When scientific publications are published, repository copies of the publications must contain links to the officially published versions.
4. Project research publications, unless there is an embargo period, must be opened immediately after submission to the repository.

5. Open access to scientific publications in the fields of biomedical, physical, technological and agricultural sciences may be subject to a six-month embargo period, and to a twelve-month embargo period for scientific publications in the humanities and social sciences.
6. Authors of publications and/or their institutions are advised to negotiate with publishers to implement the above principles or to choose another journal that can ensure compliance with the requirements of these Guidelines.
7. Article processing charges (APC), book processing charges (BPC) and the costs of publishing in open access journals or open access books may be charged to projects funded by the Council and shall be included in the project's cost estimate.
- 8.. Costs for opening publications in hybrid journals are not covered by Council projects.
9. All books and articles published in open access journals for which article and/or book preparation fees have been paid must be published under a Creative Commons CC-BY licence

Open Access to data

1. The project leader shall ensure that the data generated during the implementation of the project are preserved in digital format and, at the end of the project, are transferred to the institution for preservation and/or made available to the repository. The data must be retained for at least 5 years after the end of the project.
2. The promoters of the project for which the data will be stored shall submit a data management plan in the application. The data management plan may be revised during the project.
3. Costs incurred for the implementation of the data management plan during the project period may be charged to projects funded by the Council and shall be included in the project cost estimate.
4. The data on which the scientific publications referred to in Section IV of the Guidelines are based must be made openly available at the same time as the publications. These data must be available in repositories or by other means specified by the publishers of the publications and linked to the relevant publications.
5. Project promoters may be exempted from the provisions of the Guidelines on open access to data (or part of it), subject to a reasoned explanation, if:
 - 5.1. the data were not generated during the project, or the scientific publication is not based on original data, i.e. they were not collected and/or generated during the project.
 - 5.2. there is a need to protect the results with a view to the use of the data for commercialisation or industrial development purposes.
 - 5.3. the release of the data is incompatible with confidentiality requirements.

5.4. the disclosure of the data would be contrary to the requirements for the protection of personal data.

5.5. the disclosure of the data would hinder the achievement of the objectives of the project.

5.6. there are other legitimate reasons for not opening the data.

“Ștefan Cel Mare” University of Suceava

At the national level, there is a strategy for adopting open science principles by 2030 (see [The White Book of the Transition to Open Science, 2023 – 2030](#)).

The Vision states that "By 2030, the research culture will go through a transformational process towards the openness, reuse, and reproducibility of research results, increasing the transparency, quality, and efficiency of research, enriching knowledge, accelerating innovation and response to the major societal challenges.". To achieve the Vision, 8 strategic objectives have been detailed:

1. "Ensuring Open Access to Scientific Publications Resulting from Publicly Funded Research"
2. "Managing Research Data and Ensuring Open Data Access"
3. "Ensuring Transparency, Equity in the Costs of Open Publication, and Access to International Publications"
4. "Development of Infrastructures and Services for Open Science"
5. "Ensuring Open Science Governance"
6. "Developing the Capabilities Required for Open Science Implementation"
7. "Adapting the Research Evaluation and Rewarding Process to the New Context of Open Science"
8. "Involving Citizens in Science"

Each strategic objective has several actions that operationalize the way the objective can be achieved.

The targets for achieving the Vision are as follows:

- (2030) 100% of scientific publications resulting from publicly funded projects are open access.
- (2027) 70% of research data is FAIR, and as much as possible open.
- (2030) Specific infrastructures, services, and digital repositories are adapted to open science and, where possible, integrated into the European Open Science Cloud (EOSC).
- (2026) The national curriculum is adapted to the European data stewards training framework.
- (2030) 80% of researchers and staff in academic and research institutions have the necessary skills to implement specific open science practices.

(2026) A more diverse range of open science-specific research activities and outputs are recognized and rewarded in research assessment.

At the university level there is no specific regulation addressing Open Science and each group of researchers apply the European or National level guidance rules.

University of Ostrava

National Strategy

The Czech national strategy is based on the document entitled “National strategy for open access to scientific information 2017-2020”, which reflects the European goals in the context of the Czech environment. It defines the goals and the potential ways of their implementation. It is not a legislative document that would impose duties on academic and research institutions. This strategic document is of preliminary value and thus it still lacks a more thorough contextualisation and a comprehensive elaboration of the challenges of implementation universities and research institutions could be supported by.

Legislative framework

Currently, there is no effective law or a directive on Open Science Policy, however, the government has designed a bill “Act on Research, Development, Innovation and Knowledge Transfer” which is now under consideration.

The draft version strongly supports the full implementation of the Open Science policy to make “information from research” accessible.

It can be summarized saying that the Act’s real impact can hardly be predicted, however, providing information (for free) is its goal. Currently a key concern of Czech institutions is if the implementation of Open Science principles and rules will be supported with appropriate funding.

Practical framework

Open Science requirements are nevertheless already often met. Data Management Plans have become a mandatory part of any grant proposal submitted to some of the agencies or an explanation how the research data will be dealt with is required. These approaches by providers in the Czech Republic are manageable, not demanding for the researchers, and easy to comprehend.

For Operational Programmes projects co-funded by the EU, the ministries tend to request all published outputs with Creative Commons Licenses. Publishing the initial submitted report alone may not be sufficient; it is preferable that the final version, following the review process, is freely accessible under a CC license by the time it is published by the publisher. Additionally, with the emphasis on publishing in Q1 (or Q2) journals, which are predominantly hybrid, there is a concern about paying publishers twice. This situation can have two effects: a) the project applicant may need to adjust their budget, diverting funds from "pure research" to the APC budget, and b) the primary author may be limited to publishing

only the specified number of outputs, even though the project team might be capable of producing more results.

University strategy

The university has no strategy yet in the sense of a separate conceptual document, nor a Rector's Directive. The Strategic Plan of the University, however, mentions the importance of implementing steps towards an Open Science policy.

Regarding the intended strategy, independently of official documents, it can be stated that the Open Science policy will be supported and steps to be taken will be thoroughly considered to make the plan meaningful as well as realistic and sustainable.

Considering that Open Science principles can be easily obtained via sharing submitted preprints and avoiding commercial publishers, there is some scepticism in increasing the percentage of open-access (OA) publications by the authors from the University of Ostrava, because of financial concerns and the adverse impact on the real research funds, which are decreased by the cost associated with OA publications.

Regarding Open Data, the obvious strategy is to develop methodologies and manuals that would help the authors from the University to meet all expectations. At the University of Ostrava, we still lack an Open Science Manager, the position has been established and open competition published, finding expert staff unfortunately a challenge.

Legislative Framework

The Open Science policy at the UO is not yet embedded in a Rector's directive, in particular, a measure is needed that would make the persistent identifier ORCID mandatory for each University author.

Practical framework

From the practical point of view, the ORCID is required any time an author inserts a new publication item into the internal publication database (PUBL) which is necessary to "count" the publication.

The publication database PUBL serves as a means for all publications co-authored by employees from the University of Ostrava to be registered. So, it contains all the metadata required by the national database, however, it also allows for attaching, e.g., PDF files, which opens the possibility to attach the final version of the published work. The database is not technically ready to be considered an institutional repository. However, it can serve as a place of storage that would enable export of the database items to a future repository.

Apart from the PUBL database, the University of Ostrava operates also Dspace-based <https://explore.openaire.eu/> repository that is running on the URL <https://eduo.osu.cz/>. It does not contain publications co-authored by authors from the University of Ostrava. Its goal is to store publications such as books, proceedings of conferences organized by the University, and some journal titles, that are published by the University of Ostrava. Most of them are already stored or intended to be

stored in the repository in the near future. One potential way ahead is to consider this EDUO repository also as the major repository that could store all publications, including scientific papers, co-authored by employees the University of Ostrava. This would require the above-mentioned export of items from PUBL to EDUO.

The University of Ostrava receives 7-9 tokens per year from Springer, Wiley, and Taylor & Francis publishing houses respectively to cover the Open Access publication which needs otherwise be paid for. The allocation principles within Czech research environment are now being changed; the tokens will be provided only to authors of publications dedicated to a strategic University Operational Programme project.

5.6 Other Alliances' Open Science Policies

To contextualise our analysis of Open Science as implemented by other EUI Alliances, it is important to note that our analysis is selective rather than exhaustive. We have chosen to focus on a sample of three alliances—YUFE, EUNICE, and CHARM-EU—as illustrative examples. While examining only a subset has its limitations and may not encompass the full spectrum of Open Science initiatives, these three examples were deemed sufficient to provide a representative overview of current practices, challenges, and innovations in the field. This approach allows us to get meaningful insights and identify common themes and areas for improvement that could be applicable on a broader scale.

YUFE Open Science

The YUFE Open Science initiative embraces the DAPE methodology — Diagnosis, Alignment, Pilots/Practices, and Engagement/Education/Training — to forge a cohesive Open Science strategy across its universities. The initial phase conducts an extensive survey to understand current practices and identify obstacles. The Alignment Phase then analyses these to synchronize training and Open Science practices. This is followed by the Pilots/Practices Phase, launching initiatives like the Full Open Science program to reinforce research team support. The Engagement/Education/Training Phase advances these efforts, creating tools like the Open Science Calendar and Games. Despite active engagement in Open Science, gaps remain, particularly in legislation and citizen science. Recommendations focus on enhancing training, support, and adherence to the Open Science Commons Principles.

EUNICE Alliance

EUNICE Alliance's Open Science endeavours began with a comprehensive survey, leading to the development of an Open Science Framework centred around FAIR data principles and transparency. The alliance places a strong emphasis on open access and research data but faces legal constraints such as GDPR. The recommended strategy involves bolstering OER and infrastructure, enhancing communication with a variety of stakeholders, and promoting inclusivity of knowledge systems.

CHARM-EU Alliance

CHARM-EU Alliance prioritizes the future of scholarly publishing, focusing on open access and adherence to FAIR data principles. It seeks to integrate with the European Open Science Cloud and is proactive in developing education and skills in Open Science. There is a significant thrust towards incorporating Open Science into HR and career development, as well as fostering public engagement, especially in citizen science projects.

Together, these alliances provide a snapshot of the collective effort to navigate the evolving landscape of Open Science in Europe. They each contribute unique perspectives and strategies, reflecting a shared commitment to enhancing transparency, collaboration, and accessibility in research.

5.7 NEOLAIa Alliance Open Science Policy – Main Pillars

NEOLAIa Open Science Policy defines nine main pillars, that are described below. All the activities in the Alliance will be following the following pillars:



NEOL Approach (Navigate, Engage, Outline, Launch)

This principle outlines the main methodology for the ongoing development and refinement of the NEOLAIa Open Science policies and practices, including stakeholder engagement, strategic planning, and the launch of initiatives.



Alignment with National and European Policies

Ensuring the Open Science policy is in sync with national laws and European directives. Adapting to the goals set by the European Commission for digital education, research, and science (European Commission's 2030 Digital Compass)



Citizen Science and Community Engagement

Citizen Science is championed across NEOLAIa universities, fostering community engagement and participatory research methods within the scientific process.



Regional Leadership and Global Contribution

This principle outlines the main methodology for the ongoing development and refinement of the NEOLAIa Open Science policies and practices, including stakeholder engagement, strategic planning, and the launch of initiatives.



Collaborative Advocacy

NEOLAIa actively participates in regional and international advocacy efforts for Open Science, working in tandem with various networks and organizations to promote its widespread adoption.



Commitment to FAIR Principles

The FAIR data principles are vigorously promoted by NEOLAIa institutions, ensuring that research data management adheres to the highest standards of accessibility and interoperability.

7

Open Dissemination of NEOLAIa

Research Results: Making NEOLAIa research findings freely accessible to the public with no access restrictions.

8

Ubiquitous Integration of Open Science

NEOLAIa universities endorse the comprehensive integration of Open Science as essential for propelling research quality and innovation forward. The adoption of Open Science practices is encouraged, prioritizing enhancement of research excellence, and will be pursued wherever possible. This approach is rooted in the belief that the best results stem from intrinsic motivation and the recognition of the value Open Science adds to the academic and global community

9

Adoption by Encouragement and Incentives for Researchers and Staff

NEOLAIa supports a culture where Open Science policies are embraced through encouragement and incentives, respecting academic freedom and acknowledging that mandating such practices is not the approach of the alliance. The institutions promote the adoption of Open Science on the basis of its merits and benefits to the research community and society at large, rather than through imposition.

As showcased in Section 5.3, UNESCO vision on Open Science appears to be particularly relevant for NEOLAIa, as the work planned in WP8 aligns naturally within UNESCO areas of Open Access, Open Data and Citizen Science, each one conjugated in good practices. To wit, all NEOLAIa nine pillars, described above, can be placed into the activities of the UNESCO umbrella diagram. Some pillars are overarching, serving as political and strategic actions (Pillar 2, 4, 5, 8 and 9), thereby placed on UNESCO “umbrella”, while others (namely Pillar 1, 3, 6 and 7) are more specific, tactical actions in the three UNESCO areas of Open Data, Open Access, and Citizen Science. The resulting, summary image of NEOLAIa Pillars for Open Science is shown in Figure 3.

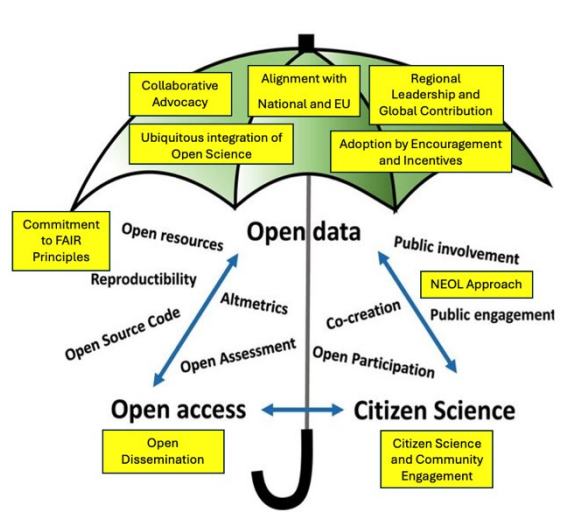


Figure 3 - NEOLAIa nine pillars in the context of UNESCO Open Science "umbrella" definition.

6. Conclusion - Foreword

The next deliverable D8.2 “*Intermediate Report on the NEOLAIa Open Science Policy*” (Due in Month 22) will provide an update on the NEOL approach and will describe the main pillars of the NEOLAIa Open Science Policy in detail. It will also provide guidelines on the practical implementation of the NEOLAIa Open Science Policy across the participating universities. D8.2 will address the varied levels of autonomy within the alliance, as expressed by our stakeholders. For instance, some universities might already have the mandate to require researchers to deposit their preprints or post-prints in institutional repositories. While these repositories may initially keep such deposits closed or restricted, they ensure that the data and research outputs are securely stored. This approach allows for the possibility of opening these resources in the future, should conditions permit. Furthermore, the upcoming deliverable will explore the idea that not all data and research need to be open. Instead, we aim to promote a gradual and strategic approach to openness, aligning with the specific capabilities and commitments of each institution within the NEOLAIa Alliance. This strategy recognizes the complex landscape of Open Science adoption and seeks to foster a flexible, yet progressively open environment for sharing research outputs.

7. References

- Grant Agreement. Project 101124794 — NEOLAIa (2023).
- Consortium Agreement. Project 101124794 — NEOLAIa (2024).
- <https://rea.ec.europa.eu>
- <https://op.europa.eu/>
- <https://research-and-innovation.ec.europa.eu/>
- Hecker S., Garbe L., Bonn A. (2018), The European citizen science landscape – a snapshot, in Hecker S., Haklay M., Bowser A., Makuch Z., Vogel J., Bonn A. (eds.), Citizen Science - Innovation in Open Science, Society and Policy, pp. 190-200. UCL Press.
- <https://zenodo.org/>
- <https://www.unesco.org/en/open-science>
- Maedche, A, Elshan, E, Höhle, H, Lehrer, C, Recker, J, Sunyaev, A, Sturm, B & Werth, O 2024, 'Open Science: Towards Greater Transparency and Openness in Science', Business & Information Systems Engineering. <https://doi.org/10.1007/s12599-024-00858-7>
- Katherin Wagenknecht, Tim Woods, Francisco García Sanz, Margaret Gold, Anne Bowser, Simone Rüfenacht, Luigi Ceccaroni, Jaume Piera (2021); EU-Citizen.Science: A Platform for Mainstreaming Citizen Science and Open Science in Europe. Data Intelligence 2021; 3 (1): 136–149. doi: https://doi.org/10.1162/dint_a_00085
- Wehn, U., et al. (2020): Global citizen science perspectives on open science. CSGP Citizen Science & Open Science Community of Practice to the UNESCO Recommendation on Open Science Available at <https://pure.iiasa.ac.at/16729> Accessed June 24th 2024
- <https://openaccess.mpg.de/>