

Recognising Open Science practices in higher education staff assessment

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Purpose and background of this document

University staff should be recognised for Open Science practices as part of their assessment, for instance in annual and promotion reviews. In this document, we propose guiding questions to help facilitate this assessment for topics relevant to Open Science practices. We wrote this document at the 2024 Open Science Retreat in the Netherlands, and for this reason, we focus on the Dutch higher education context. The document may also be applicable outside the Dutch context.

In proposing the guiding questions, we use the UNESCO's definition of Open Science, where **Open Science** *"is defined as an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the 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."* (UNESCO 2021).

We drew inspiration from existing initiatives and documents such as the [Open Science Career Assessment Matrix](#) (OS-CAM), [Open Science: A Practical Guide for Early-Career Researchers](#) (Brinkman et al. 2023), [Guzman-Ramirez, et al., \(2023\)](#), and [NOR-CAM](#).

Why do we need to include Open Science in Research Assessment?

As a signatory of the San Francisco Declaration on Research Assessment ([DORA](#)), Dutch higher education institutes are committed to making research assessment more comprehensive (rather than based solely on journal-based metrics) and to encouraging and incentivising participation in Open Science. Open Science is also a part of the [Netherlands Code of Conduct for Research Integrity](#), which promotes openness and transparency in research processes. All Dutch individuals involved in research are bound by this Code of Conduct for Research Integrity. There are also developments in the Netherlands ([Regieorgaan Open Science](#), [Recognition and Rewards](#)) and globally ([COARA](#)) that increasingly see Open Science as the norm in research. In addition, funders (such as [NWO](#) and [Horizon Europe](#)) are increasingly mandating Open Science practices. However, we do not have a good way of assessing how we are doing in terms of Open Science. Thus, we wrote the guiding questions to start the conversation and reflect on where we are and where we want to go on the Open Science journey.

This is an overview of Open Science activities that can be discussed - this does not mean that all of the aspects are relevant to everyone. Thus, this list should not be seen as a mandatory, exhaustive checklist that all individuals should adhere to.

Category	Subcategory	Supporting questions on what you have done OR what you will do in the future (if applicable)?	Definition
Research	Publishing	<p>Have your articles/monographs been published Open Access?</p> <ul style="list-style-type: none"> • If not, what will you do to open up your research? <p>Do you make use of preprints?</p> <p>Do you use preregistration/registered reports?</p> <p>Do you share/publish negative results?</p> <p>Do you conduct your reviews openly (Open Peer Review)?</p>	<p>Open Access means that articles are freely available on the public Internet and that any user may read, download, copy, distribute, print, search, or link to the full text.</p> <p>A preprint is a version of a scholarly or scientific paper that has not been formally peer-reviewed and published in a journal. It is usually uploaded by the authors to a public server (such as arXiv and BioRxiv) where it is openly available.</p> <p>Preregistration is the practice of specifying your research plan in advance of your study and submitting it to a registry (Open Science Framework).</p> <p>A registered report is an article format in which the research proposal is peer-reviewed before the research is carried out. Once approved by the reviewers and the editors, the results are published as long as the study plan is followed and any deviations are clearly indicated. This article format facilitates the publication of negative results and reduces time wasted on irrelevant study proposals.</p> <p>Open Peer Review means that the review content is published openly, and in addition the identities of the peer reviewers may be open (The Turing Way).</p>

Research	Data	<p>Do you publish your datasets openly? If so, where?</p> <ul style="list-style-type: none"> • Do you publish your processed data? • Do you publish your raw data? • How does your shared data contribute to the reproducibility of your work? • To what extent do you follow the FAIR principles? • Have your shared datasets been re-used or led to further collaboration? <p>Have you discussed your Data Management Plan with relevant support staff (such as a Data Steward, Ethics Committee and/or Privacy Team)?</p>	<p>Open data is data that can be freely used, re-used and redistributed by anyone (Open Data Handbook).</p> <p>Raw data is the data originally generated by a device or a person, which has not yet been processed or altered. Processed data is the data that has been modified and translated to address research questions.</p> <p>FAIR (The Turing Way) is an acronym for:</p> <ul style="list-style-type: none"> • Findable: Research objects need to be accompanied by metadata (information about the data such as keywords) and a persistent identifier (such as a DOI). • Accessible: Data may be openly available, or it may require authentication and authorisation procedures. • Interoperable: Research objects can be integrated with other research objects and interoperate with applications or workflows. Using metadata standards, which are more formal ways of structuring the data, makes it easier to integrate research objects. Using open data formats makes it easier to integrate and preserve data. • Reusable: Research objects should be well described so that they can be used, combined, and extended in different settings. They also need to be accompanied by a licence (allowing re-use and redistribution), so that potential re-users know what they are allowed to do with the research objects. <p>Note, FAIR does not necessarily mean open - some FAIR datasets cannot be freely used or distributed by anyone.</p> <p>Reproducible research can be independently recreated from the same data and the same code that the original team used (The Turing Way).</p> <p>A Data Management Plan is a living document that describes how your research outputs will be generated, stored, used and shared within your project (The Turing Way).</p>
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Research	Code / Software	<p>Do you publish your code/software openly?</p> <ul style="list-style-type: none"> • Do you publish it in a (data) repository? If so, where? Is it registered in a software directory? • To what extent do you follow the FAIR principles? • Is the software open source? Under which license is it shared? <p>How does your shared code contribute to the reproducibility of your work (for example, use of CODECHECK)?</p> <p>How do you ensure that your code is reproducible (for example, use of Docker)?</p> <p>Do you build on or contribute to existing projects?</p> <p>Is your software developed and shared in a sustainable way (for example, do you use a Software Management Plan to ensure this)?</p>	<p>Open-source software can be viewed, used, modified, and redistributed for any purpose.</p> <p>FAIR Research Software refers to research software developed according to the FAIR principles (see also FAIR4RS Principles).</p> <p>Software Management Plan helps to implement best practices during software development and ensures that software is accessible and reusable in the short and long term.</p>
Research	Methods	<p>Do you share your methodology openly (Open Hardware, Open Methods)?</p> <p>Do you use open platforms, tools and services in your research (for example, using Python instead of MATLAB)?</p> <p>How do you ensure that your methods are reproducible?</p>	<p>Open Hardware: Physical objects that are licenced in such a way that the object can be studied, modified, (re)created, and redistributed by anyone.</p> <p>Open Methods are available details of the research methods, such as procedures, protocols, plans, notes and interpretations.</p>

Research	Collaboration	<p>Do you use tools that allow for more detailed contribution information, such as CRediT?</p> <p>Do you contribute to projects that you do not lead? If so, how?</p> <p>Do you engage in team science through, for example, cross-disciplinary research?</p>	<p>CRediT allows you to specify the contributions that individuals have made to research objects, which is facilitated by Tenzing.</p> <p>Team science is an approach to research in which a team of researchers from different disciplinary backgrounds carry out research together so that their individual strengths and expertise are demonstrably mutually reinforcing. (Based on the NWO description of the Team Science Award).</p>
Education	Resources	<p>Do you make your educational resources open?</p> <ul style="list-style-type: none"> • In which languages are your Open Educational Resources (OER) available? • Do you use open platforms to share the resources? <p>Do you make use of open materials such as open source software?</p>	<p>Open Education is a collective term that encompasses educational resources, tools and practices that can be freely used in the digital environment without legal, financial or technical barriers (The Turing Way 2022).</p> <p>Open Educational Resources (OERs) are teaching and learning materials that can be freely used and reused for learning or teaching, without cost.</p>
Education	Collaboration	<p>Do you use tools that allow for more detailed contribution information (for example, script writers/producers) such as CRediT?</p> <p>Do you involve students in your course development, for example adjustments to the syllabus or co-developments of course assignments?</p>	

<p>Outreach/ Impact</p>	<p>Impact</p>	<p>Who can potentially benefit from your research?</p> <ul style="list-style-type: none"> • Do you prepare a stakeholder analysis in your research projects? • Do you design an engagement plan to reach your stakeholders during and/or after your research? • Do you include these stakeholders in your research process (for example through Citizen Science)? • Is there any evidence of the use of your research (results) by, for example, societal groups, individuals, and communities? <p>How do you plan to engage more effectively with any potential stakeholders in your research?</p>	<p>Citizen Science (community-led research, participatory research): the involvement of members of the public in scientific research through jointly:</p> <ul style="list-style-type: none"> • setting research priorities, and/or • developing research methodology, and/or • collecting and analysing data, and/or • publishing research results and/or • using the results for advancing societal change.
<p>Outreach/Imp act</p>	<p>Engagement</p>	<p>Do you use any public engagement methods (such as podcasts, news articles, public talks, workshops with citizens) during your research and/or after the results are published?</p> <ul style="list-style-type: none"> • Do you receive support/advice from others (such as communication teams, library, other researchers)? <p>How do you ensure that your research is available in the relevant language(s)?</p> <p>How do you plan to engage more with the general public?</p>	<p>Science communication or public engagement is the practice of engaging, informing, educating, and raising awareness of science-related topics among the general public.</p>

Leadership	-	<p>Do you develop a vision, strategy, and/or policy for integrating and raising awareness of Open Science practices within your faculty/department/research group?</p> <p>Do you take a leadership role in Open Science Communities or Open Science projects/events/training?</p> <p>How do you promote an inclusive working environment?</p>	
Mentorship	-	<p>Do you mentor/support others in Open Science practices? If so, how?</p>	
Professional development	-	<p>Do you attend conferences and/or trainings with a focus on Open Science/skills for Open Science practices?</p> <p>Do you have a role with an Open Science focus? For example, trainer, working group/project member, or being an Open Science ambassador/champion.</p> <p>Have you secured any funding for Open Science activities?</p> <p>Are you involved in Open Publishing (Diamond Open Access Journals, editing and reviewing)?</p>	<p>Open Science Ambassadors/Champions are individuals who are taking a leading role in the practice of Open Science at their institute, such as the Data Champions at TU Delft.</p> <p>Diamond Open Access is Open Access where neither the reader nor the authors pay fees to publish or read.</p>

Institutional involvement	-	<p>Do you participate in any Open Science Communities?</p> <p>Do you promote Open Science within the faculty/department/research group? (for example, discussing Open Science topics and/or providing support within the department)</p>	<p>Most of the Dutch institutes have an Open Science Community (OSC), a bottom-up learning initiative where members can share expertise, learn from each other and advocate for change.</p>
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Further Resources related to Open Science assessment

- [Guzman-Ramirez, et al., \(2023\) Badges to Reward Open & Responsible Research Practices](#)
- [NWO \(2019\) Recognition Rewards Position Paper \(pdf\)](#) and [Recognition and Rewards](#) website
- [Read the Declaration | DORA \(sfdora.org\)](#)
- [FAIR | Use a publicly accessible repository with version control \(fair-software.nl\)](#)
- [FAIR research software | Research Software Management | Digital Competence Centre | University of Groningen \(rug.nl\)](#)
- [FAIR Cheatsheets: help with open publication of research data and software - News - Utrecht University \(uu.nl\)](#)
- [DORA | NWO](#)
- [EC: Evaluation of research careers fully acknowledging Open Science practices](#)
- [ORION: ORION Open Science Factsheets](#)
- [Guidance Document for HorizonEurope projects - Google Docs](#)
- [Open Science: A Practical Guide for Early-Career Researchers](#)
- [The Career Framework for University Teaching](#)
- [FORRT Glossary of Open Scholarship Terms](#)

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