Creating and circulating Knowledge in Resilient Societies

Open Science @ Leiden University

1. A transformation of the way we create and circulate knowledge
2. Why is a change necessary?
3. What has been realized?
4. Our ambitions
   Developing open knowledge practices: five key areas
5. How are we going to do this?
6. Members of the Open Science Working Group
7. Best practices

Discover the world at Leiden University
A transformation of the way we create and circulate knowledge

We live in a globally connected knowledge society. Knowledge has become a crucial component in every country, although the forms of knowledge vary by culture and social and economic configuration. This has changed the way universities must connect to society.

This is where open science and open scholarship come in. Creating and disseminating knowledge in a more open way can radically improve the quality of life in contemporary society. Researchers, teachers, and scholars at Leiden University have developed a series of initiatives to contribute to a more open and sustainable practice in research and teaching. The Open Science Program of the university, Creating and Circulating Knowledge in Resilient Societies, aims to support these bottom-up initiatives and increase their scope.

The shift towards Open Science is based on the following prevailing values of the university: Transparency, Accessibility, Open to participation, Integrity, Honesty, Academic freedom, Accountability, and Responsibility.

“Open Science represents a new approach to the scientific process based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools” (European Commission, 2016).

Open Science does not by definition entail that all scientific products and publications are accessible to everyone at any time. Different academic fields will have to define their own route and speed to develop Open Knowledge principles that are relevant and achievable in their daily work practices: “As open as possible, as closed as necessary”.

Discover the world at Leiden University
Stimulated by the democratization of science and technological innovation, numerous initiatives by scientists, research funders, and governments, have been developed to give science a new, fundamentally transparent life. This is internationally captured under the broad term "Open Science".

Universities, governments and research funders have made Open Science and Open Access the norm. This is evidenced by the launch of Plan S, the new framework used by the European Union and the Rutte III coalition agreement. The Netherlands has opted to actively stimulate Open Science through its National Platform Open Science. Such rapid development of Open Science requires cooperation between universities on a national and international scale, and therefore a proactive attitude on the part of Leiden University.

**Open Science is essential in order to:**

- Increase the quality of the research results and data;
- Improve the quality of (inter)disciplinary cooperation;
- Bring the integrity of the research process to a higher level, and with it prevent fraud in research;
- Enable the public to play a more active role in the research agendas (e.g. Dutch National Research Agenda);
- Use research data faster and on a larger scale for research, policy, and applications;
- Stimulate social and technological innovation.
What is already realized? Open Access (OA)

- Policy implemented since 2017 has already made it mandatory for researchers affiliated with Leiden University (LU) to make their peer reviewed academic publications available via LUCRIS and the University repository Scholarly Publications (Green OA).

- Since December 2020 all scientific and professional articles (short works) can be made openly available in Leiden’s Scholarly Publications after a maximum period of 6 months.

- The university monitors the number of these OA publications.

- LU researchers and authors are also able to make use of a large number of OA deals, usually without additional costs, which have been made with high quality publishers.

- The university library actively supports all researchers to achieve the open access obligations of their publications.

- An increasing number of publishers are prepared to publish books OA immediately (Gold OA). Principal investigators and research team members of NWO financed projects can submit a request for funding from NWO to help cover the cost of OA book publishing.

- In addition, the non-profit organization Knowledge Unlatched helps libraries share the cost of OA book publishing. Through this cooperation libraries (among which the UBL) create a sustainable business model for OA books.

More information on OA can be found on the UBL website.
In April 2016, Leiden University launched its research data management (RDM) regulations. These regulations were established to make it easier for researchers to comply with RDM requirements set by funders and other external parties to enhance the transparency and integrity of research. The RDM regulations are inspired by the FAIR Principles (ensuring that data and software are Findable, Accessible, Interoperable, and Reusable by humans and machines.) These are widely adopted by research funding and research performing organizations. The RDM regulations apply to three distinct stages of data management: before, during, and after research.

Additional services and support are offered to LU researchers to help ensure researchers meet the requirements as mentioned in the RDM regulations. The university has a template which researchers can use to describe their data management plan (DMP). Data stewards inform researchers about the Leiden regulations, offer training, and give advice on how to write a DMP. They also advise the faculties how best to implement the RDM regulations on a faculty level. Through the ISSC and the faculties, the university offers basic services for researchers to make their research data findable and accessible.

More information on FAIR data and Data management can be found on the UBL website.
What is already realized? Research software and Citizen Science

After completion of the research process, research data need to be sustainably stored in combination with the meta data, software, and other documentation that is required for reuse. Leiden University wants to enhance the visibility of software as scientific output, make software FAIR, and wants rewards and recognition for research software. In order to do so, a Leiden Data Competence Center (LDCC) is being set up.

The Citizen Science (CS) Lab in the Faculty of Science acts as a knowledge hub and incubator by combining expertise from pioneering CS projects and research into CS itself, and stimulates innovation related to all aspects of CS.

Citizen Science comes in many shapes and sizes. Depending on the research project, it can be fruitful to ask members of the non-scientist public (citizens) to assist with data collection, or (once data has been collected) to help with the classification or interpretation of data. Research projects can also be co-created with citizens. Citizen-led science initiatives can also be of interest to researchers. Thus, researchers sometimes even participate in citizen research initiatives.

More information about Citizen Science can be found at the Citizen Science Lab.

1. A transformation of the way we create and circulate knowledge
2. Why is a change necessary?
3. What has been realized?
4. Our ambitions
5. Developing open knowledge practices: five key areas
6. How are we going to do this?
7. Members of the Open Science Working Group
8. Best practices

Discover the world at Leiden University
Traditionally a strong emphasis has been placed on the published results of science: a book (chapter) or a peer reviewed article in a prestigious journal. The methods and data are not given nearly as much attention. With the new broader perspective of Open Science, more attention is also paid to ‘how’ research is conducted. This includes the way we obtain, share, and interpret data, at what point in the research process we share a research design, and in what way we share software. What is important in Open Science is the creation of knowledge and its dissemination: not just the final products or results.

We'll distinguish between the ambitions specific to the Open Science program, and the ambitions within the different Open Science themes.

**Ambitions Open Science program 2021 - 2027**

The program

1. Connects different Open Science initiatives and programs throughout the university.
2. Drives evidence informed Open Science
3. Enhances the visibility of Open Science

---

**The way we reach these ambitions**

1. Develop the Open Science principles in programs such as EUNiWell, Erkennen en Waarderen, and Research Datamanagement
2. Create a Chair of Open Science that will study this fundamental transformation of the scientific and scholarly research process. This will include monitoring the progress being made and delivering evidence to inform open science policies.
3. Make the different Open Science practices and steps in the research process more visible and highlight the different options that a researcher has.
4. Information about Open Science becomes an integral part of all Leiden University communications.
5. Share best practices in Open Science and organize events on a regular basis.
6. The Open Science Community Leiden will act as a catalyst for sharing best Open Science practices.
Our ambitions: Open Access

Open Access to Results, Process, and Agenda

**Ambitions**

1. All researchers are aware of all the possibilities to publish their research results Open Access.
2. Researchers can publish OA in many formats besides peer reviewed articles.
3. Researchers are encouraged to publish their research publications as early as possible.
4. We work towards an affordable and diversified OA approach.

**The way we reach these ambitions**

1. Encourage and support faculties and institutes to develop a publishing policy, keeping in mind national and university guidelines.
2. Explore the possibility with stakeholders to support the publication of OA books.
3. Share best practices on how to preregister research and publish preprints.
4. Facilitate the discussion around the possibilities of university hosted or third-party alternative publication platforms.
5. Management and monitoring of OA publications.

---

1. A transformation of the way we create and circulate knowledge
2. Why is a change necessary?
3. What has been realized?
4. **Our ambitions**
   Developing open knowledge practices: five key areas
5. How are we going to do this?
6. Members of the Open Science Working Group
7. Best practices

---

Discover the world at Leiden University
Our ambitions: FAIR data

**FAIR data and data management support**

**Ambitions**

1. Researchers are supported by a community of data stewards.
2. A federated infrastructure enables researchers to find, access, and combine interoperable datasets and research software in order to process, analyse, share, archive, and publish FAIR data.
3. FAIR data is included in the reward and recognition process.
4. Data will be Findable, Accessible, Interoperable, and Reusable for both humans and machines.

**The way we reach these ambitions**

1. The capacity of data stewardship within the faculties and institutes will be strengthened.
2. Encourage and Support faculties and institutes to develop a FAIR data protocol.
3. The Leiden Digital Data Competence Centres will be developed to act as the hub to connect local, national, and international infrastructures.
4. FAIR practices will be communicated by organizing events, by means of Open Science ambassadors and by sharing best practices.
5. A data catalogue will be realised to make FAIR research data visible.
6. Management and monitoring of FAIR data.
Our ambitions: Research software

Open Research methods and software

Ambitions
1. Researchers are knowledgeable about the benefits and rationale of Open research methods and software.
2. A federated infrastructure enables researchers to find, access, and combine interoperable datasets and research software in order to process, analyse, share, archive, and publish FAIR data.

The way we reach these ambitions
1. Establish and coordinate a network for sharing knowledge about research software management (including research software engineers).
2. The Leiden Digital Data Competence Centre will establish an infrastructure to archive, share, and publish research software.
3. A research catalogue will be realised to make LU research software visible.
4. Develop and implement a central software policy.
5. Management and monitoring of research software.

Discover the world at Leiden University
Our ambitions: Citizen Science

Citizen Science

Ambitions

1. Citizen Science practices are embedded in (international) research, education, clinical practices, and societal activities in Leiden and The Hague.

2. Leiden researchers are aware of the opportunities to strengthen the connection with society and heighten societal impacts via citizen science.

The way we reach these ambitions

1. The Citizen Science Lab will be a project incubator and a knowledge hub for the whole university. The lab will invite Leiden University colleagues and societal actors to make Citizen Science part of their research.

2. Raise awareness about Citizen Science by sharing best practices with the scientific community.

3. Strengthen the capacity for citizen engagement in research within the faculties and institutes via dedicated webinars, workshops, and training.
Our ambitions: Open Science Community Leiden (OSCL)

The Leiden Open Science Community (OSCL) was established in 2019. It is part of a growing International Network of Open Science Communities (INOSC). OSCL is a bottom-up learning community that discusses open science practices within and across disciplines. The OSCL makes knowledge and experiences more visible and accessible for scholars and policy makers, thereby playing a facilitating role in scaling up the best practices from pioneering researchers to common practice.

The OSCL strives to facilitate a culture change in all layers of the university. It aims to further the discussion about how practicing open science will contribute to researcher’s careers in science. An important part of this change is that best practices need to be rewarded and recognized.

The OSCL will serve to:
- function as the eyes and ears in the institutes of each faculty, allowing for a rich diversity in open science practices to feed into policy.
- organize workshops on topics that allow employees to take the next step towards open science.
- connect experiences and knowledge across department boundaries.

To enable the OSCL to reach these ambitions, it will be strengthened by Open Science ambassadors.

More information on how to take your next step in Open Science can be found on the OSCL website.
Developing open knowledge practices requires progress in five areas

Our general priority areas are:

1. Development of new and more effective use of already existing research infrastructures for effective and open knowledge sharing.
2. Development of open knowledge practice skills in the relevant scientific communities.
3. Investment in and the spreading of best practices and inspiring strong examples of effective knowledge sharing.
4. Reform the rewards and recognition system to include open knowledge practices.
5. Incorporate open science in the key responsibilities of academic leaders at Leiden University.

Why these areas?

Open Science involves a change. These five priority areas each contribute to making this change possible. In order to share data, methods, software, and publications, accessible infrastructure is needed. Researchers who want to share their work, need the skills to do so. Furthermore, researchers need to be aware of the possibilities and the benefits of open knowledge to be active in this change. Being rewarded and recognized for participating in Open Science serves as a further incentive for researchers. Academic leaders can lead by example and inspire others to follow.
1. By communication about best practices and raising awareness
   The smaller scale of most bottom-up initiatives carries the risk that parts of the university remain unaware of these initiatives. For this reason, we aim to raise awareness of Open Science initiatives at all scales by sharing best practices with the scientific community. In this way, we’re not only creating awareness, but we are also inspiring others to get involved.

2. With an integrated approach
   Open Science is a broad concept that contains numerous themes and initiative. Initiatives and developments related to Open Science are spread out throughout the university and different centrally organized programs. In order to move forward, a connection between these different programs is essential.

   Leiden University’s approach to Open Science is strongly informed by the work of organizations such as the European Commission Open Science Policy, the Dutch National Open Science platform and League of European Research Universities (LERU) Open Science Ambassadors, which recommend leading practices for the implementation of the Open Science principles. The experience gained and lessons learned from the implementation of Open Science at Leiden University can in turn be used to strengthen national and international leading practices.
3. By means of Open Science profiles
Open Science should be in tune with disciplinary and field diversity. Disciplines have diverse ways of doing research, have different methods, work with different materials and people, and produce different types of research outputs. These result in different priorities, ambitions, and obstacles for each field. These differences do not always match the traditional borders of faculties. For this reason, Leiden University will work with Open Science profiles (OSP).

4. Evidence Informed
Since the transition to Open Science has major consequences for the way in which researchers work and are assessed, a thorough scientific analysis of the transition process and intended impact of Open Science is a distinctive part of the Leiden Open Science program. Many Open Science policies are based on assumptions that may not have been sufficiently tested. By means of accurate scientific research, the Leiden Open Science program aims to provide evidence-informed direction for the implementation of Open Science at the university.
# Members of Leiden University Open Science working group

**Open Science ambassador**
Paul Wouters (Dean Faculty of Social and Behavioral Sciences)

**Working group Open Science**
Kurt De Belder (Leiden University Libraries)
Emma Kooijman (Strategie en Academische Zaken)
Jacqueline Kruse (Strategie en Academische Zaken)
Laurents Sesink (Centre for Digital Scholarship)
Jacko Koster (Research Datamanagement program)
Thed van Leeuwen (Centre for Science and Technology Studies)
Sonja Meeuwsen (Leiden Universitair Medisch Centrum)
Frans Snik (Citizen Science Lab)
Anna van ’t Veer (Open Science Community Leiden)

---

**Function of working and focus group**
- Link with the official body of the university
- Coordinate the alignment between different Open Science related programs and activities.
- Establish the connection between faculties

---

**Focus Group Open Science**

1. A transformation of the way we create and circulate knowledge
2. Why is a change necessary?
3. What has been realized?
4. Our ambitions
   Developing open knowledge practices: five key areas
5. How are we going to do this?
6. Members of the Open Science Working Group
7. Best practices

---

Discover the world at Leiden University
Open Science initiatives can be found throughout Leiden University. Ranging from research projects with citizens to organizing a Reprohack, these initiatives show that Leiden University is passionate about Open Science and its possibilities. Examples of best practices can be found [here](#) or watch this short video.