

Framework for
Open and
Reproducible
Research
Training



FORRT

Integrating Open Science into Education & Research

SINCE 2018



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In this booklet, we'll introduce you to FORRT and some of our resources and projects. But we hope this is more of an *invitation* to get involved and become part of our community.

We will highlight projects from each *Focus Areas* of FORRT (1. Education & Pedagogy; 2. Metascience & Research; 3. Social Justice & DEIA; 4. Community & Sustainability) and end with our vision for FORRT's future.

We warmly welcome you to be(come) part of this future.

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ABOUT FORRT

FORRT (Framework for Open and Reproducible Research Training) is an organization that advocates for **research transparency, reproducibility, rigor, justice and ethics** through pedagogical reform and meta-scientific research. Established in 2018 as a **grassroots, volunteer-based** organization, FORRT now includes over **1500+ researchers** from diverse fields in Social, Behavioral, and Life Sciences and the Humanities, including Psychology, Ecology, Medicine, Epidemiology, Computer Science, Philosophy, History, and many other disciplines.

We provide **pedagogical infrastructure and didactic resources** designed to recognize and support the **accessible and inclusive teaching and mentoring** of open and reproducible research.

Our goals:

- Promote **incremental adoption** of open science practices in higher education
- Educate on **epistemic uncertainty, plurality, humility, research integrity, and credibility**
- Reframe open science as **inclusive scholarship**
- Advocate for greater **recognition of educational contributions**

FORRT raises awareness of the **pedagogical implications of open and reproducible scholarship** and its associated challenges, and advocates for the opening and **formal recognition of teaching contributions** to facilitate access, discovery, and learning for those who would otherwise be **educationally disenfranchised**.

EDUCATION & PEDAGOGY

FORRT's Curated Resources

FORRT's curated resources database now hosts over **1400 open science materials** organized according to the framework of FORRT's clusters.

FORRT's Curated Resources

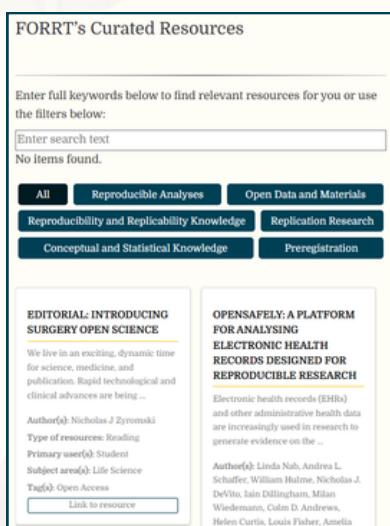
Enter full keywords below to find relevant resources for you or use the filters below:

No items found.

All Reproducible Analyses Open Data and Materials
Reproducibility and Replicability Knowledge Replication Research
Conceptual and Statistical Knowledge Preregistration

EDITORIAL: INTRODUCING SURGERY OPEN SCIENCE
We live in an exciting, dynamic time for science, medicine, and publication. Rapid technological and clinical advances are being ...
Author(s): Nicholas J Zyromski
Type of resource: Reading
Primary user(s): Student
Subject area(s): Life Science
Tag(s): Open Access
[Link to resource](#)

OPENSAFELY: A PLATFORM FOR ANALYSING ELECTRONIC HEALTH RECORDS DESIGNED FOR REPRODUCIBLE RESEARCH
Electronic health records (EHRs) and other administrative health data are increasingly used in research to generate evidence on the ...
Author(s): Linda Nah, Andrea L. Schaffer, William Hulme, Nicholas J. DeVito, Iain Dillingham, Milan Wiedermann, Colin D. Andrews, Helen Curtiss, Louis Fisher, Amelia



You can contribute to the database by adding missing resources yourself!

forrt.org/resources



FORRT's Glossary

Open scholarship has transformed research practices, but new terminology can be overwhelming. Unfamiliar vocabulary creates barriers for newcomers and vague definitions confuse experienced researchers alike.

This **crowdsourced initiative** brings together over **110 contributors** who have defined more than **250 terms** using clear, jargon-free language and relevant references.

The glossary clarifies terminology across disciplines, **reduces barriers for newcomers** to open scholarship, and facilitates **efficient communication** in teaching and mentoring.

You can contribute to the Glossary by adding terms, improving terminologies, and adding translations.

forrt.org/glossary



FORRT's Lesson Plans

FORRT's lesson plans help address the challenge that pedagogical resources are regularly created but often not openly shared. We have compiled **evidence-based, high-quality resources** using expertise from our community of researchers and teachers, making it easier to develop content without starting from scratch. Topics include *Interpreting Effect Sizes, Generalizability Crisis, and Understanding the replication crisis with app activities.*

Each lesson plan and activity is sorted by **theme, learning outcome, and delivery method**, so educators can quickly find what works best for them.

You can contribute by giving your feedback on the lesson plans or add your own ideas to the **Table of Activities**.

forrt.org/lesson-plans/



Open Research Games Portal

The Open Research Games Portal is a **free, community-curated directory of games** related to open scholarship. Whether you're looking for serious games to teach reproducible research practices or lighthearted icebreakers about research culture, the Portal includes any game that helps **disseminate knowledge, foster engagement, and/or supports learning in open research.**

This Portal is unique in its inclusion of **practical implementation notes and user testimonials**, highlighting user experiences and different ways the games can be used in education.



You can contribute by sharing your own game, suggesting games you've discovered, or adding information and reviews to existing entries.

forrt.org/games/



JUST-OS

JUST-OS (Judicious User-friendly Support Tool for Open Science) is an innovative AI-powered chatbot developed through collaboration between researchers at the *University of Groningen* and FORRT.

This initiative addresses a widespread challenge: helping researchers, teachers, students, and others **navigate the vast landscape of open science resources** efficiently and confidently.



Meet JUST-OS, the friendly AI jellyfish companion designed to guide you through the Open Science landscape. When you ask a question about Open Science practices, tools, or principles, JUST-OS retrieves relevant information from its carefully curated knowledge database. Using advanced **Large Language Models (LLMs)**, it formulates **clear, personalized responses**.



What is Bropen science?

Bropenscience refers to the aggressive machismo and exclusionary behavior observed in open science circles [1]. This term was coined by Olivia Guest to describe the condescending, forthright, aggressive, overpowering, and lacking kindness and self-awareness behavior often exhibited by men in open science [1]. Bropenscience is seen as a problem in the open science movement, as it can be exclusionary and hurt women and other underrepresented minorities [1].

Use JUST-OS yourself on just-os.org and keep an eye out for the planned FORRT website integration.



METASCIENCE & RESEARCH

Replications (FReD & FReD Annotator)

Replications are central to open scholarship, but keeping track of which findings hold up can be challenging as replication efforts grow. **FORRT's Replication Database (FReD)** provides a **central location** where anyone can explore past **replication efforts**.

The database makes **replication data more accessible**, promotes transparency, and encourages new replications by showing what's already been tested and discovered.

Additionally, the **FReD Annotator app** takes this further: simply input a reference, and it shows you whether that work has been replicated. This **practical tool** helps researchers and educators make **informed choices** about which work to cite and teach, avoiding the perpetuation of findings that haven't held up under scrutiny.

REPLICATION DATABASE

Learn more about the FReD and other FORRT replication projects.

forrt.org/replication-hub

Submit your own replication study to the FReD Database.

Try out the FReD Annotator for yourself.

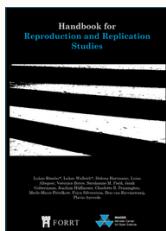


Handbook for Reproduction and Replication Studies

Our handbook enables researchers to conduct **high-quality reproductions and replications** across social science disciplines. Repeatability is important because it's essential for building **reliable scientific knowledge**. By repeatedly testing claims with the same or new data, **limits of generalizability can be identified** and researchers and practitioners can better decide whether to build on a previous finding. Our guide walks researchers through the **entire process of conducting rigorous replications and reproductions**, from selecting a target study to publishing your finding.

Have a look at the Handbook yourself! You can contribute by giving your feedback on the current version.

forrt.org/
[replication_handbook](#)



<h1>Handbook for Reproduction and Replication Studies</h1>
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<h2>The Replication Process</h2>
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5 Execution of Reproductions
6 Execution of Replications
7 Discussion
<h2>Advanced Topics and Applications</h2>
8 Communicating and Publishing
9 Field-Specific Replication Challenges: An example from MRI research
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Impact of OS on Students

In the last ten years “**The credibility revolution**” has transformed academic practices. However, these practices remain **underintegrated into teaching and mentoring**.

FORRT reviewed the evidence on teaching open and reproducible scholarship to students. The findings show that integrating these principles into higher education **improves scientific literacy, engagement with science and attitudes towards science**.

If you want to know more and/or need help convincing them to integrate more open scholarship in their teaching, have a look at the published manuscript! Additionally, if you know of more studies on this topic, reach out by email or via Slack.

forrt.org/impact/



Replication Research (R2) Journal

Replication Research (R2), is a **free to read, free to publish, researcher-led, multidisciplinary, diamond open access journal**. It was developed in collaboration with the *Münster Center for Open Science (MüCOS)* and is hosted by the *University of Münster*. We publish **replication studies, reproductions, and interdisciplinary discussions**. These types of work have been **traditionally undervalued and difficult to publish**, despite being crucial for science. We're changing that by sharing rigorous replications, whether you're reanalyzing existing data or testing claims with new data, through **transparent peer review** and at **no cost** to authors and readers.

 **R2 REPPLICATION
RESEARCH**

You can contribute by submitting your own replication research to the journal or apply to become a member of the R2 Editorial Team.

replicationresearch.org



SOCIAL JUSTICE & DEIA IN ACADEMIA

Academic Wheel of Privilege

Authorship order determines research impact and career advancement in academia, yet decisions about it often lack **fairness and equity**. By favoring privileged researchers, current systems of **recognition** reinforce existing authorship inequities.

To address this, Team Neurodiversity developed the **Academic Wheel of Privilege (AWoP)**, an interactive app that assesses academic privilege through an intersectional framework that can help **guide author order decisions**, among other applications. By integrating accessibility, inclusivity, diversity, equity and social justice, AWoP helps the academic community build a research culture that values diverse backgrounds and experiences.



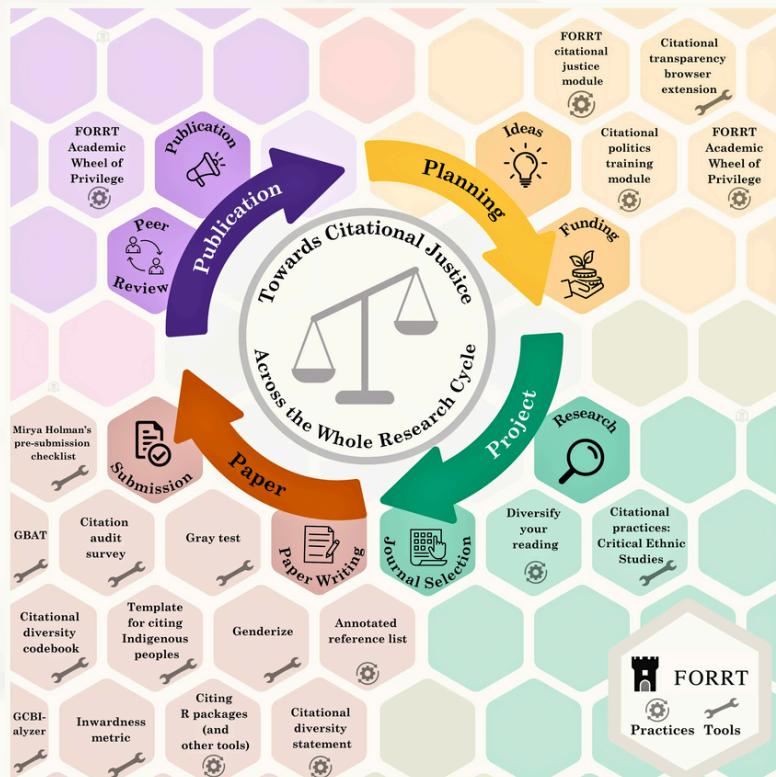
Explore the AWoP toolkit yourself and let us know if you have ideas for improving the accessibility or any other aspect.

[forrt.org/
awop](http://forrt.org/awop)



Citation Politics

Higher **citation counts** supposedly indicate higher quality, but in reality, citation practices often function as a **reproduction of existing power structures**. The **Citational Justice Toolkit** introduces a toolkit that individuals can use to **encourage a conscientious, and more just, citation practice**.



There are many ways to contribute to the Citational Justice Toolkit - have a look at our website to see how you can help promote equity and justice in academia.

forrt.org/citation-politics



Team Neurodiversity

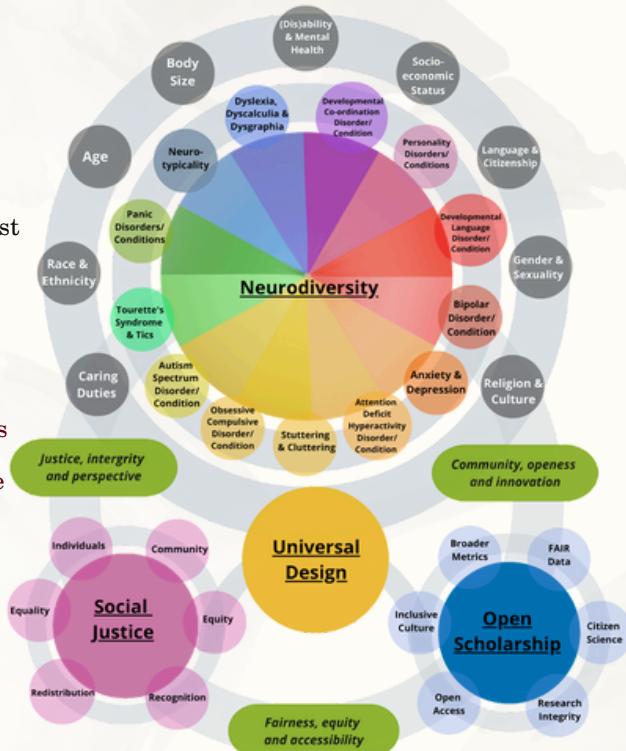
'Their strengths and deficits do not deny them humanity but, rather, shape their humanity' (Grinker, 2010, p.173).

Team Neurodiversity explores how open scholarship can support the neurodiversity movement and strengthen the link between open practices and neurodiversity. Together, we're looking at ways open scholarship and neurodiversity can work together to make **higher education more inclusive and accessible** for everyone.

Team Neurodiversity does diverse work including creating **inclusive curricular resources**, producing **discourse** around the benefits of an inclusive academia, creating an **annotated reading list** on neurodiversity, and developing **practical tools** such as the Academic Wheel of Privilege app.

Team Neurodiversity is always welcoming new members and there are many projects you can contribute to. You do not need to be neurodivergent to take part.

[forrt.org/
neurodiversity](http://forrt.org/neurodiversity)



COMMUNITY & SUSTAINABILITY

Credit & Contributorship

Within FORRT, we use **Tenzing**, an online app and R-package, to **track and report the contributions** of each team member using **CRedit (Contributor Roles Taxonomy)** in an efficient way, allowing us to document who did what on each project. This ensures **contributions are properly recognized and credited**, which is especially important for early-career scholars and others who rely on FORRT for professional development, mentorship, and resources. Through **responsible leadership and clear documentation**, we **maximize the impact** of our collective efforts.



Process for Projects

In the name of transparency, here's how the process for FORRT projects works: **Everyone can propose new ideas** through our Slack. If an idea is approved, it gets assigned to a **project leader** and receives its own Slack channel. We share the project to reach more people, organize meetings, and work together to complete it. Finished projects are published on our website and social media. When relevant, community members collaborate to write and publish a paper that's **reviewed by the FORRT community** before submitting it to a journal.



Have a look on forrt.org to learn more about FORRT and all its projects.



FAIR & CARE

FORRT applies the FAIR and CARE principles in its work, particularly within its efforts in Community & Sustainability and its broader mission for open scholarship.

FAIR:

- **Findable:** FORRT makes its resources findable through organized databases and online platforms.
- **Accessible:** We emphasize accessibility in educational resources by co-developing **multilingual resources**, including lesson plans and a community-sourced glossary, and by offering an educational and learning toolkit.
- **Interoperable:** FORRT's collaborative approach and efforts to standardize terminology through its glossary facilitate **compatibility across diverse fields and disciplines**.
- **Reusable:** Many of FORRT's resources are organized by theme, learning goal, and delivery method to make them easy for educators to reuse. We also put systems in place to **continuously update and tailor our resources** to keep them relevant and reusable over time.

CARE:

- **Collective Benefit:** FORRT aims to build a **just, inclusive, and sustainable ecosystem for open scholarship**, centering the voices and needs of students, early-career researchers, educators, scholars from the Global South, and those from minoritized backgrounds.
- **Authority to Control:** FORRT broadly implements **participatory governance models**, giving marginalized communities power over projects that concern them.
- **Responsibility:** Our mission explicitly challenges the status quo of academic power and aims to **redistribute power, credit, and access**.
- **Ethics:** FORRT's work is grounded in principles of **social justice, diversity, equity, inclusion, and accessibility (DEIA)**. We actively promote ethical data stewardship by integrating qualitative methods, epistemic diversity, and structural critiques into research, pedagogy, and policy.

FORRT Community

FORRT is a **welcoming, worldwide, volunteer-based community**. We're committed to fostering an **open, inclusive environment** where everyone - regardless of background, identity, or experience - can contribute to advancing open and reproducible research education. We value **respectful collaboration, diverse perspectives, and mutual support.**

Community Map

The FORRT Community Map visualizes the **global reach and diversity** of the FORRT community. It reflects FORRT's dedication to inclusivity and building a diverse **network** of scholars, educators, and researchers united in advancing open science principles worldwide.



The majority of FORRT's operations go through our Slack channel. We use Slack to keep everyone up-to-date, coordinate teams, and provide a platform for ongoing discussions on our projects.

You can join the **slack channel** and check out other ways to get involved with FORRT.

forrt.org/about/get-involved/



VISION

Curriculum Hub

FORRT's mission is to create a **comprehensive, open resource hub** that empowers educators and learners to **understand and implement Open Science principles** through high-quality, community-curated materials.

Our vision centers on a **Curriculum Hub** organized by **thematic clusters**, offering **foundational knowledge** (readings, glossary entries, curated resources), **teaching materials** (lesson plans, slides, games, syllabi), and **pedagogical support** (exemplary teaching practices, activity descriptions, didactic guidance).

What makes FORRT unique is our **community-driven, iterative approach**. We actively gather feedback, testimonials, and real-world experiences from educators and learners. A clear process enables community members and others to **submit suggestions, contribute materials, and help refine resources continuously**.

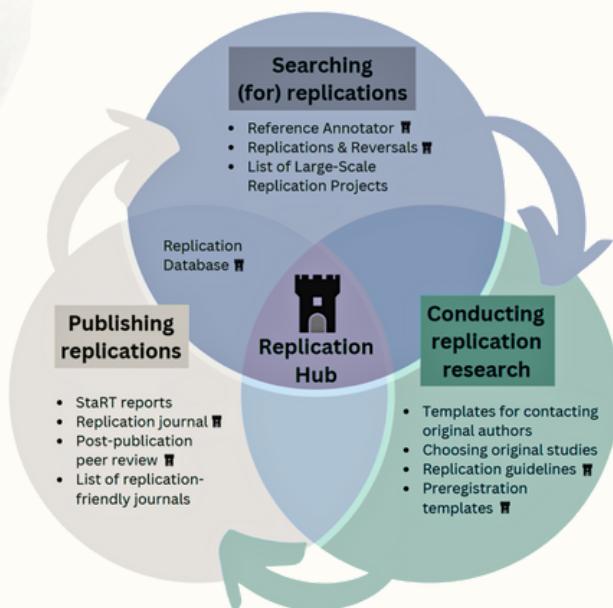
You can help to realize this vision by contributing with your expertise, feedback, and resources to help build this dynamic and impactful learning hub.

Replication Hub

FORRT's vision for the development of the **Replication Hub** is that of a **one-stop resource for all things related to replications and reproductions**. Organized around the **stages of research**, from identifying what to replicate to planning, publishing, and rewarding, the Hub will provide **coordinated tools, templates, databases, and educational materials** that make replication accessible and rewarding.

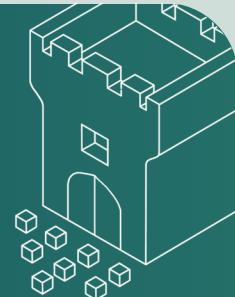
What sets the Replication Hub apart is its ongoing dedication to **openness and teamwork**. By making replication a key part of research culture and evaluation, we aim to **boost public trust** and make sure that solid findings help **move science forward**.

There are many exciting projects in the works for the Replication Hub. Join the Slack and check out the website to see what you can do.



FORRT'S PARTNERS, COLLABORATIONS & COOPERATIONS

- Society for the Improvement of Psychological Science (SIPS)
- Center for Open Science (COS)
- Liberate Science
- The ReproducibiliTea
- The UK Reproducibility Network (UKRN)
- Access 2 Perspectives
- Project TIER
- The German Reproducibility Network (GRN)
- The ReplicationWiki
- PaPOR TRAIL
- The Stanford Big Team Science (BiTS) Lab
- The Collaborative Replications and Education Project (CREP)
- The Nowhere Lab
- Advancing Big-team Reproducible science through Increased Representation (ABRIR)
- Quala Lab
- Open Life Science (OLS)
- The Berkeley Initiative for Transparency in the Social Sciences (BITSS)
- Metadocencia
- The African Reproducibility Network (AREN)
- The Collaborative Library
- Incentivising Collaborative and Open Research (ICOR)
- The Junior Researcher Programme (JRP)
- Feminist Wonderlab Collective
- The Open Science Learning GATE
- The Brazilian Reproducibility Network (BrRN)
- The LMU Open Science Center (OSC)
- The Digital Research Academy
- The Researchers of Statistics Education (RoSE)
- The BordeauxTea
- The Münster Center for Open Science (MüCOS)
- Meta-Psychology
- Psychological Science Accelerator
- Utrecht University's Department of Interdisciplinary Social Sciences
- FORRT membership in the UNESCO Global Open Science Partnership



Learn more about
**FORRT's
Partnerships**



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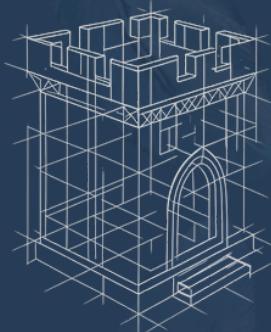
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