Nordic Perspectives on Open Science

Grassroots networks can help implement and harmonize open research efforts

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Nordic Perspectives on Open Science 2025, https://doi.org/10.7557/11.8343

Abstract

Grassroots networks are peer-led, bottom-up initiatives that can drive meaningful change in research reform. Norwegian Reproducibility Network (NORRN), a nation-wide initiative after the model from similar networks around the world, is an example of a grassroots network where a community of researchers works together towards more transparent, rigorous and robust research. By connecting with other researchers, librarians and research support staff across Norwegian universities and colleges as well as various stakeholders, including higher-education institutions and research funders, NORRN aims to help implement and harmonize open and reproducible research efforts across the country. In this paper, we describe the origins, mission, and structure of NORRN and similar networks, as well as successes, challenges and future directions of NORRN's efforts that show a critical role of grassroots initiatives in supporting research improvement.

Keywords

reproducibility network, Norwegian Reproducibility Network, NORRN, UK Reproducibility Network, UKRN, grassroots, community building, community engagement, open research, open science, open scholarship, research reform

Introduction

The growing adoption of open and reproducible research principles and practices has been changing the research landscape worldwide with the ultimate goal of normalising transparency and reproducibility to improve research practice (Munafò et al., 2017; "UNESCO Recommendation on Open Science," 2021). Achieving this goal heavily depends on top-down initiatives and structural incentives, such as new policies and research assessment criteria. However, top-down efforts alone are not sufficient for successful research reforms. Bottom-up initiatives, which are typically initiated and facilitated by researchers in the form of peer-led grassroots communities or networks, can

complement top-down effects by fostering long-term cultural change, among other benefits. An example of such grassroots initiatives are “Reproducibility Networks”, which have been established in many regions globally (22 countries and 5 continents as per 2025). Here, we outline the origins and mission of reproducibility networks with a special focus on the Norwegian Reproducibility Network (NORRN). We provide a detailed overview of NORRNs aims and structure as well as the successes and challenges in its role as a grassroots initiative for research improvement on a national scale.

Grassroots networks for open and reproducible research

What are grassroots networks?

Grassroots networks for open and reproducible research are typically peer-led, small-scale initiatives. They are often initiated and developed by early careers researchers in the form of local journal clubs (such as ReproducibiliTea Journal Club) or low-threshold meetings or webinars available to all (such as the RIOT Science Club seminar series) and are important parts of the research ecosystem, aiming to facilitate interactions among researchers to accelerate the adoption of new practices. Such communities often start as informal groups of like-minded researchers who interact to learn, support and share knowledge with each other. With time, they can have a substantial and meaningful impact and a national or even international reach, for example by contributing to the development of open research infrastructures, innovation, and policies, and to the broader visibility of open and reproducible research practices (Bertram et al., 2023; UK Reproducibility Network Steering Committee, 2021).

From one network to global federation

Even though grassroots networks have the potential to drive meaningful change, there is a considerable risk of inefficient action or duplicating efforts without effective coordination. In addition, because academia is highly interconnected not only across institutions but also across various stakeholders, such as funders and publishers, coordinated action across multiple areas can create synergies that can enhance the effectiveness of initiatives promoting open and reproducible research (Munafò et al., 2017). Here, incentives play a critical role – both in how research is currently practised but also in how easy or difficult it might be to change the research landscape (Nosek et al., 2012). Both computational modelling and empirical evidence indicate that current research incentives affect scientific outputs, for example by increasing the chances of false positive findings in the literature (Smaldino and McElreath, 2016). Because scientific publishers and research funders place a disproportionate value on novel findings (compared to the confirmation of past findings) and institutions place a high value on scientific publication and grant funding capture in hiring and promotion, researchers have less of an incentive to pursue verification or confirmation of past findings, and relatedly, to share research data, methods and tools with others. Even if one institution chooses to change how they incentivise research practices, this may have limited impact if other institutions don’t adopt the same practices. As researchers often change institutions, they are less likely to change their practices if only their current institution

incentivises these practices. Therefore, coordinated activities across stakeholders is more likely to facilitate changes in research practices.

With this in mind, a national grassroots network driven by researchers – the UK Reproducibility Network (UKRN) – was launched in March 2019 in the United Kingdom, although the concept was first suggested at a 2015 meeting (UK Reproducibility Network Steering Committee, 2021). At the time, the UKRN contained three key elements that are coordinated by the UKRN Steering group: 1) Local networks (typically at universities) of groups of researchers, 2) Institutional members that have established senior research positions for research improvement, and 3) External stakeholders, such as funding agencies and publishers. Coordinating these three elements helped better link bottom-up grassroots efforts (i.e., researchers and research support staff in local networks) with organisations that can make top-down changes. Given the varied needs of institutions and research areas, local networks have been operating in a fairly autonomous nature. As of October 2025, UKRN has over 100 local networks, 44 institutional members, and 56 stakeholder members.

Shortly after the network has been established in the United Kingdom, several other countries in Europe and beyond have followed the lead after the model from UKRN. By 2023, all national reproducibility networks (RNs) agreed to form the Global Federation of Reproducibility Networks (GFRN) to facilitate supranational coordination and growth of the international community of RNs. Currently, over 20 reproducibility networks are a part of this global federation, spanning North and South Americas, Australia, a large continental network in Africa, as well as many national networks in several countries across Europe – including in Norway.

NORRN: A grassroots network in Norway

The beginnings of NORRN

In early 2021, two grassroots open research initiatives surfaced independently in Oslo. First, a local ReproducibiliTea journal club was launched by early career researchers at the BI Norwegian Business School. Around the same time, another ReproducibiliTea journal club was created at the University of Oslo. A separate initiative, a RIOT Science Club, established its Norwegian node at Østfold University College. All initiatives aimed at creating regular forums for discussing current topics in the field of open and reproducible research. However, even though all were based in the same area, they were operating separately and with little coordination or knowledge exchange.

Reproducibility networks can help coordinate these and similar initiatives and harmonize efforts to ensure that advocates of open and reproducible research can connect, collaborate and exchange experiences. Thus, in late 2021, discussions of launching a Norwegian version of the reproducibility networks took place – with the aim of harmonizing efforts around open and reproducible research across the country and establishing synergies between local initiatives. Five researchers from the University of Oslo took initiative to establish the first idea for the network and write the terms of reference as well as the code of conduct in November 2021, followed by a town hall

meeting taking place in March 2022, introducing the vision, mission and aims as well as the initial structure of NORRN (the NORwegian Reproducibility Network)[1] to a wide audience of open and reproducible research enthusiasts across Norway. NORRN was officially launched on June 20th, 2022 at its first national hybrid conference.

Vision and mission for open and reproducible research in Norway

Aligned with the Global Federation of Reproducibility Networks, NORRN seeks to foster a national culture of transparent and reproducible research through evidence, collaboration, and education. Its main objective is to strengthen the Norwegian research landscape by advancing rigorous, robust and transparent research practices. This is achieved by education and awareness-raising, e.g. through establishing appropriate training activities and disseminating best practices, but also through contributing to research improvement efforts and their evaluation, as well as working with different stakeholders to ensure coordination across the sector. NORRN develops educational resources tailored to the Norwegian research community, ensuring that open and reproducible practices become known and used more broadly as well as introduced early in researchers' careers. Researchers in the network also conduct meta-research (i.e., research on research) that provides evidence-based guidelines for how research practice can be improved in Norway. Finally, NORRN also collaborates with key stakeholders to embed sustainable and trustworthy approaches across scientific disciplines. Through this three-fold focus on education, research and stakeholder engagement, NORRN envisions a future where open and reproducible research is not an aspiration but an integral part of the scientific culture in Norway, while also recognizing different needs for research practices in different disciplines, methodologies, and epistemic approaches.

NORRN as an organization: structure and governance model

Following the governance model from UKRN, NORRN consists of: 1) a Steering Committee, 2) Local and Institutional Nodes (led by Local and Institutional Node Leaders at Member Institutions), and 3) a Stakeholder Group (see NORRN's Terms of Reference). The network is currently coordinated by the Steering Committee with five members affiliated with different universities and colleges across Norway. The Steering Committee is supported by regular advice and knowledge exchange with other reproducibility networks from the Global Federation.

One of NORRN's Steering Committee members coordinates the network of the Local and Institutional Nodes across Norway (see Figure 1). Any researcher or research support staff at Norwegian higher-education institution can become a local node leader in NORRN, providing a mechanism through which local researchers can connect and the aims of the NORRN can be promoted within that institution. Typically, local node leaders establish open research groups, seminars, and communication platforms, run training workshops, and advocate for the broader adoption of open and reproducible research

[1] Note that the simpler acronym NORN was ruled out since the Norse mythology already used that name to refer to deities that shape the course of human destinies – probably a step too bold for a reproducibility network.

within their institution. Importantly, these local communities that form NORRN's Local Nodes are at the very core of the bottom-up, researcher-driven change towards research improvement.

To become an Institutional Node, however, the process is more formalized: an executive board or senior management at the institution needs to formally confirm that the institution supports the aims and vision of the network. Additionally, they are asked to identify a person in the management structure that would be responsible for implementation of NORRN's aims at the institution. Institutional Nodes are an important bridge between bottom-up and top-down initiatives in implementation of science reforms, and coordination between institutions is critical.

Finally, a Stakeholder Group aims to facilitate a dialogue between researchers and other stakeholders such as funders or publishers.

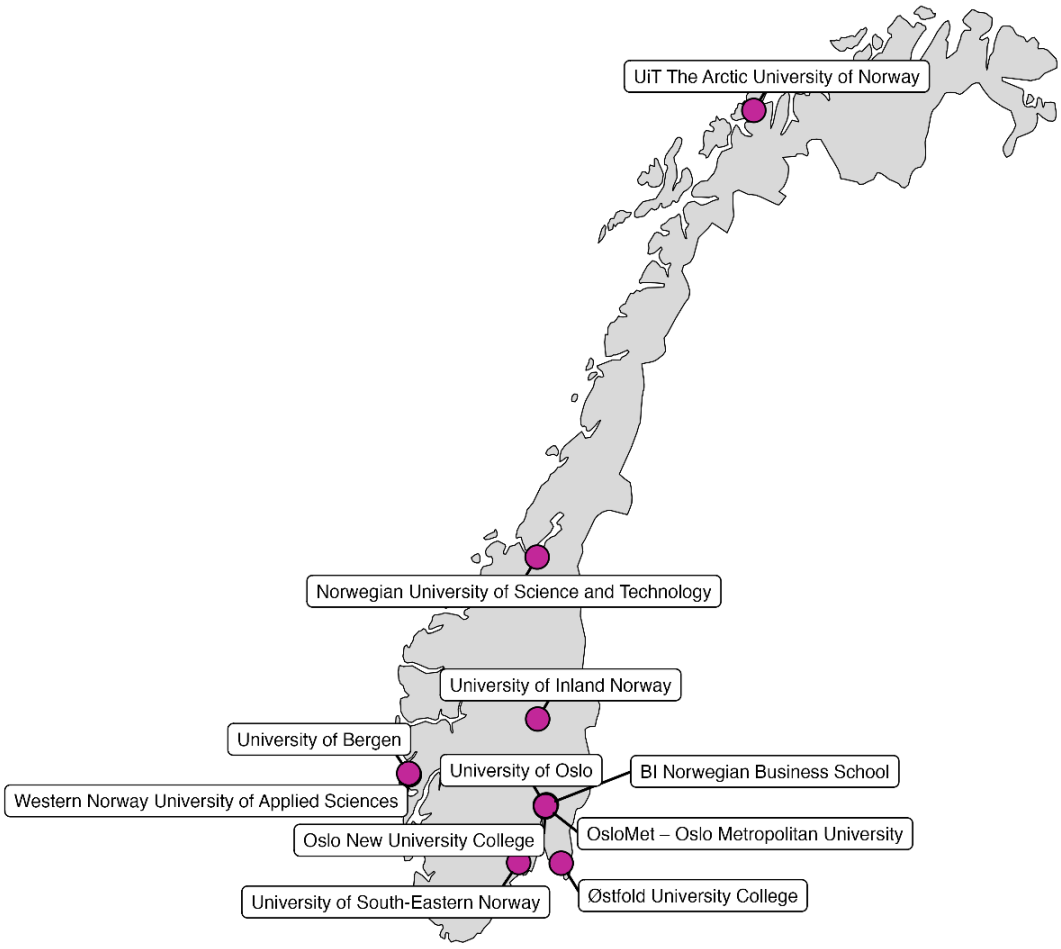

Figure 1. The map of NORRN's local and institutional nodes at Norwegian universities and colleges (per 15.10.2025).

Harmonizing open and reproducible research in Norway

First successes: training and awareness-raising

In its first years, NORRN has organized several large-scale educational activities promoting open and reproducible research in Norway. Since its launch in 2022, the network has been running an annual conference with a different thematic focus each year, for example on "Teaching Open Science" (in 2023), on “Big Team Science" (in 2024) and on "Responsible Open Science" in partnership with the Center for Medical Ethics at the University of Oslo (in 2025).

These events take place in a hybrid format – with online components and streamed keynote presentations or panel discussions, as well as in-person gatherings organized by local nodes (for example in Oslo, Bergen, Trondheim, or Tromsø). In this way, the network can connect across the country, but researchers and other interested participants can also connect locally in their respective institutions. Local in-person gatherings participate in the streamed event, as well as follow-up with hands-on workshops aimed at providing attendees with training on open and reproducible research (such as preregistration, registered reports, creation of synthetic datasets). Talks and training events are often followed by social gatherings.

In addition, NORRN has been delivering large-scale online courses in collaboration with other initiatives and organizations in Norway. For example, the network worked together with Cochrane Norway, a Norwegian node of an independent organization that specializes in reviewing and summarizing evidence in health research, to deliver an online course on preregistering systematic reviews and other types of reviews. Similarly, in collaboration with Dam Foundation (Stiftelsen Dam), a Norwegian funder for health and research projects, NORRN has been delivering online courses on preregistration for researchers who receive funding from Dam and who are required to register their research protocols. Finally, NORRN’s researchers have also initiated the first PhD course in Open and Credible Research that has been launched at Østfold University College and that all PhD candidates in Norway can take and receive credits for.

As a part of its awareness-raising activities, NORRN has also engaged in national conversations about openness, reproducibility and research integrity by publishing accessible opinion pieces or interviewing for Norwegian research outlets such as *Forskerforum* (Bochynska et al., 2022) and *Forskningspolitikk* (Gjengedal, 2024; Jeong and Mayiwar, 2022).

First successes: connecting researchers, institutions and funders

In addition to these educational events and awareness-raising, NORRN has been connecting junior and senior researchers, librarians, data managers and other research personnel across Norway by establishing almost a dozen local nodes over time, fostering broader participation and engagement. Through these connections, new initiatives have been formed (e.g., local seminars or communication channels within institutions) as well as new research collaborations in the field of open research. For example, several NORRN researchers took initiative to assess and improve transparency of secondary data research in Norway taking the epidemiological research and the

Mother, Father and Child Cohort (MoBa) dataset as a case study (Roettger et al., 2025). By creating a new collaborative research team across institutions and across different career stages, these researchers had the unique opportunity to provide a novel evidence base for maximizing transparency of epidemiological research with secondary data in Norway.

In addition to connecting researchers, librarians and data managers, NORRN also aimed to establish a bridge between bottom-up and top-down initiatives by involving institutions and their higher management. BI Norwegian Business School (BI) became NORRN's first institutional member in 2022, providing a new example for how institutions can also work together with grassroots networks. Finally, to coordinate efforts with other stakeholders, NORRN has also started collaborating with research funders. The Dam Foundation joined NORRN as the first stakeholder in 2024 and has been since closely collaborating with the network, offering support and advice, collaborating on educational events and closely following NORRN's research activity, including implementation of new evidence for best research practices.

Challenges on the way

Building, growing and running a grassroots network focused on open and reproducible research faces many challenges. Some of them are more practical – building a community and connecting researchers and other stakeholders across a country with large distances from north to south is a difficult task. Other challenges are more systemic. In Norway, universities and other higher-education institutions are generally aligned with national policies on open research, but the practical implementation of open research practices is still limited and varies considerably across institutions and fields (Wenaas and Gulbrandsen, 2022). Here, NORRN's awareness-raising and accessible education across institutions to harmonize the efforts is critical, but broader, systemic barriers and incentive structure make it difficult to create real change. The national publication-point system in Norway, which has been used to evaluate research output and allocate funding, focuses on quantity and journal prestige over openness and collaboration (Haugen and Sandnes, 2016). While positive changes are happening, such as phasing out the publication-point system for allocating funding or introducing new models for evaluation of research and researchers (such as the NOR-CAM toolbox for recognition and rewards in academic careers, Universities Norway, 2021), the key challenge still remains, which is translating these ideals into everyday research practice. Early-career researchers who see the value of transparent, rigorous and robust research studies and are eager to adopt open and reproducible research practices often find themselves in a system that still rewards novelty over quality. Some early-career researchers also feel anxious about sharing data and code, and worry about the potential consequences of not obtaining novel or "significant" results. While grassroots initiatives like NORRN might not be able to resolve these challenges, by building communities, connecting researchers with other stakeholders, creating spaces for dialogue and providing new evidence on best research practices they can contribute to shaping research norms and help address these systemic barriers.

Finally, as NORRN continues to grow in size and scope, so does the responsibility to carefully tackle the challenge of the diversity of research approaches and the dangers of promoting unified norms and solutions that might not apply to all. Many open research practices have been developed based on research approaches in STEM fields that might not be applicable to many approaches in social sciences or humanities. To some, the concept of reproducibility might also not be relevant at all and rather, the focus on transparency of the research process would be more appropriate. In many cases, the concept of rigorous research will mean something very different across different methodologies, for example when practicing hypothesis-driven quantitative research or exploratory, qualitative research. As NORRN's grassroots community grows, and discussions around research diversity deepen, the network will need to work on raising awareness on maximally inclusive open research.

Future directions

Looking into the future, NORRN aims to continue its vision and mission to promote and enable rigorous, robust and transparent research practices in Norway while also recognizing a large diversity of research approaches across the fields. The network aims to connect even more researchers through Local Nodes across the country and involve more institutions to strengthen the bridge between the bottom-up and top-down initiatives in open and reproducible research and research improvement. By growing the stakeholder group, NORRN also aims to improve coordination and dialogue between researchers, institutions and funders in Norway and make sure that research reforms and policies are well informed by evidence as well as by the needs and barriers that researchers face in their everyday practice. In this context, NORRN also aims to contribute to the improvement of inclusivity of open and reproducible research, making sure that training, guidelines, requirements and policies for increased openness and reproducibility take various research disciplines, methodologies and epistemological approaches into consideration. Through this coordinated grassroots effort, we believe that researchers, in collaboration with other stakeholders, can drive a meaningful change towards better research.

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