

TRUSTparenthood

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ABSTRACT:	This deliverable presents the draft TRUSTparency training materials designed to support the development and implementation of institutional Reproducibility Promotion Plans (RPPs). The materials include a training handbook and trainer's guide covering key concepts of reproducibility, barriers and drivers, reproducibility interventions, stakeholder mapping, resource considerations, receptivity, and contextual relevance. Through interactive activities and practical guidance, the training equips participants with the knowledge and skills needed to co-create effective, context-sensitive reproducibility strategies.
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TRUSTparency training handbook

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Generative AI tools were used during the preparation of this handbook exclusively to improve the grammar, syntax, and stylistic flow of the text. Final editorial control and responsibility for the content remain entirely with the authors.

Introduction

TRUSTparency (<https://trustparency-project.eu/>) is a three-year project funded by Horizon Europe. The project aims to enable stakeholders – research performing organisations (RPOs), researchers, funders, publishers, and learned societies – to foster transparency and promote more reproducible research. To achieve this aim, one of the objectives of TRUSTparency is to develop training materials for acquiring skills necessary to develop and implement reproducibility promotion plans (RPPs) for their institutions.

Developing an institutional RPP requires a shared foundation of knowledge about reproducibility and research integrity principles, an understanding of the role different contexts play in enabling reproducibility, and essential co-creation skills. The TRUSTparency training will equip participants with the knowledge and skills to identify the effects of these factors in their own work and institution, and to set actionable goals toward greater reproducibility.

This training handbook is intended to introduce the reader with key aspects of reproducibility and co-creation skills necessary to create an RPP and as a general guideline to enable researchers and others involved in the research process from different contexts to collaborate in creating an RPP for their institution. While the handbook can be explored separately, it is intended for use with an accompanying trainer's guide with detailed instructions for activities and handouts.

The handbook is organised into eight units that all follow a common structure to support consistent learning on reproducibility and across different aspects of RPP development. Each unit begins by explaining why the topic matters for reproducibility and RPPs. This is followed by a knowledge building section that introduces key concepts and practical considerations needed to develop and implement an RPP effectively. Reflective guiding questions then prompt readers to think critically about challenges and implications for their own contexts. Each unit concludes with concise takeaways that summarise the main messages and highlight actionable insights, alongside a list of further reading for those who wish to explore the topic in greater depth. The handbook progresses from core concepts relevant to understanding and discussing reproducibility (Units 1–4) to the contextual factors that shape the feasibility of RPP (Units 5–8).

Unit 1: Understanding reproducibility

Why does it matter for RPP development?

Reproducibility of research can take on different meanings or definitions based on the research context or methodological approaches involved. To facilitate researchers and other stakeholders from diverse contexts to co-create RPPs, it is first necessary to make these differences explicit and to develop, where feasible, a shared or at least mutually understood set of perspectives on reproducibility. In addition to differing definitions, reproducibility is also shaped by the broader research ethics and integrity culture, which strongly influences how reproducibility is perceived and implemented.

What do we need to know to take action?

There are many definitions of research reproducibility, some of which overlap or contradict (Barba, 2018), but they generally refer to a minimum standard for enabling the repetition of a study and, ideally, for reaching the same research results and inferences. Understandings of reproducibility can differ significantly between research fields, methods and contexts. Different definitions of reproducibility may also be used among peers. Therefore, it may be helpful to use a common framework that accommodates for these differences. Throughout these training materials, we will use key terms as they are defined in the iRISE glossary (Voekl et.al. 2024):

- **Replicability** is the extent to which the design, implementation, analysis, and reporting of a study enable a third party to repeat the study and assess its findings;
- **A replication study** is a study that repeats all or part of another study and allows researchers to compare their findings;
- **Reproducibility** is the ability to achieve similar or nearly identical results using comparable materials and methodologies.

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Related key terms and definitions can be found in the iRISE reproducibility glossary.

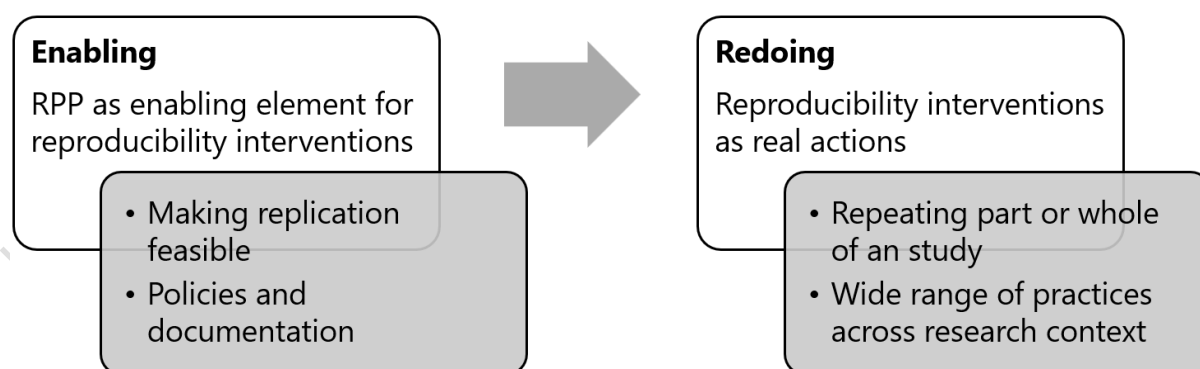


Figure 1: Enabling and redoing in reproducibility (based on Ulpts & Schneider 2025).

For the purposes of developing an RPP, it may also be helpful to think of reproducibility practices in two main categories of redoing and enabling (Ulpts & Schneider, 2025). Redoing refers to replicating or reproducing parts (methods, data, analysis or otherwise) or the entirety

of a study, while enabling refers to practices that enable others to redo parts or the entirety of a study, “tracing the how and why of research practices” (Ulpts & Schneider, p. 24). In this context, an RPP is an enabling element, helping research organisations identify and enact reproducibility interventions (Figure 1).

Throughout this training handbook, we will explore various aspects of reproducibility interventions – actions or policies aimed at making research more replicable and reproducible –, and the challenges associated with implementing them. These challenges can be grouped in the broad categories of resources, receptivity and relevance of reproducibility (Fanelli 2026), see Figure 2 obtained from D1.3, which are detailed in the following units. Understanding these categories will help you choose suitable reproducibility interventions for your research context.

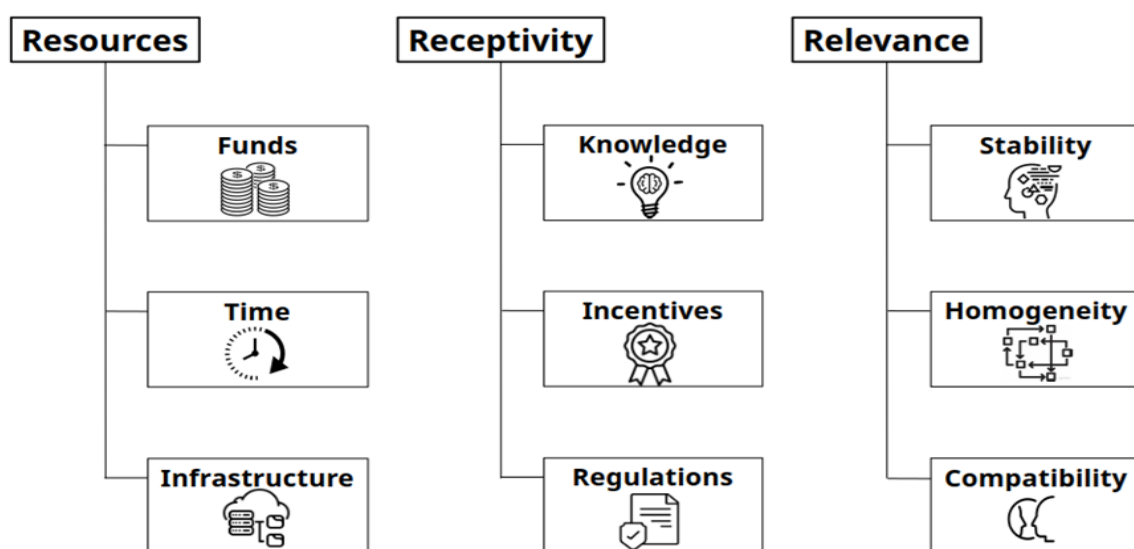


Figure 2: Framework of factors affecting applicability of reproducibility interventions (Fanelli 2026).

Guiding questions for change agents

1. How is reproducibility understood across your research community? How do definitions differ between disciplines, methods and stakeholder groups?
2. How might differing definitions and/or research ethics and integrity culture influence levels of engagement during the RPP creation process?
3. What practical steps could you take to ensure that diverse perspectives on reproducibility are meaningfully reflected in the RPP?

Takeaways

- Definitions of reproducibility can differ among research contexts and researchers. Core concepts include replicability of study design, which enables replication studies to test the reproducibility of the findings of the replicated study. Establishing a shared understanding is integral for co-creating an actionable RPP.

- Reproducibility practices can be seen as enabling and redoing practices. Developing the RPP enables reproducibility interventions to be implemented effectively.

Further reading

Barba, L. A. (2018). *Terminologies for Reproducible Research* (arXiv:1802.03311). arXiv. <https://doi.org/10.48550/arXiv.1802.03311>.

Fanelli, D. (2026). *Framework to map epistemological disparities and inclusivity challenges among end-user communities*. [Not yet published]

Ulpts, S., & Schneider, J. W. (2025). *A conceptual review of uses and meanings of reproducibility and replication*. MetaArXiv. https://doi.org/10.31222/osf.io/entu4_v3.

Voelkl, B., Heyard, R., Fanelli, D., Wever, K., Held, L., Würbel, H., Zellers, S., & Maniadis, Z. (2024). Glossary of common terminology resulting from scoping reviews (iRISE Project Deliverable). European Union Horizon Europe Programme. <https://osf.io/br9sp/files/ewybt>.

Unit 2: Barriers and drivers of reproducibility

Why does it matter for RPP development?

Understanding the existing barriers and drivers of reproducibility can help create a more realistic picture of what is necessary to bring reproducibility to life in a research setting. This unit discusses barriers and drivers more generally, while later units address specific aspects affecting the feasibility of specific reproducibility interventions.

What do we need to know to take action?

Researchers' and other stakeholders' openness to implement reproducibility interventions is affected by a range of barriers and drivers at systemic, institutional, community and individual level. While some of these are related to specific methods, data types or interventions, some common barriers and drivers can be observed across contexts.

At the systemic level, a significant barrier to fostering reproducibility is caused by existing incentive structures that reward novelty and rapid publication (the 'publish-or-perish' paradigm). Systemic incentives are manifested throughout the research process (Munafò et.al., 2017), see Figure 3, including publication and citation bias toward studies with positive and/or statistically significant results (Duyx et.al., 2017). Rewarding published research also creates a tradeoff between investing in reproducibility and the incentive to 'rush into print' (Heesen 2018).

At the same time, a study examining researchers' experiences of barriers and drivers across different research contexts indicates that clear reproducibility requirements backed by adequate resources can also enable reproducibility (Kozula et.al., 2026). The same study found that disciplinary and cultural norms can act both as barriers and drivers of reproducibility, while various motivations shape researchers' engagement with reproducibility at the individual level, including ethical, intellectual, reputation and efficiency concerns.

At the community level, reproducibility is also deeply connected with core research integrity principles such as reliability, honesty, respect and accountability. The ALLEA European Code of Conduct for Research Integrity (2023) defines research integrity through these principles, emphasising that research should be conducted and reported in ways that ensure validity and trustworthiness.

Without the support of core guiding principles, reproducibility becomes difficult to maintain as a long-term priority. Therefore, it is important to openly discuss the role of core research integrity principles in your institution, particularly to understand differences among research contexts, and to build a shared culture of research integrity and reproducibility.

Across all levels, access to skills, infrastructure, time, and funding shape the feasibility of enacting particular reproducibility interventions. These factors are covered in greater detail in later units.

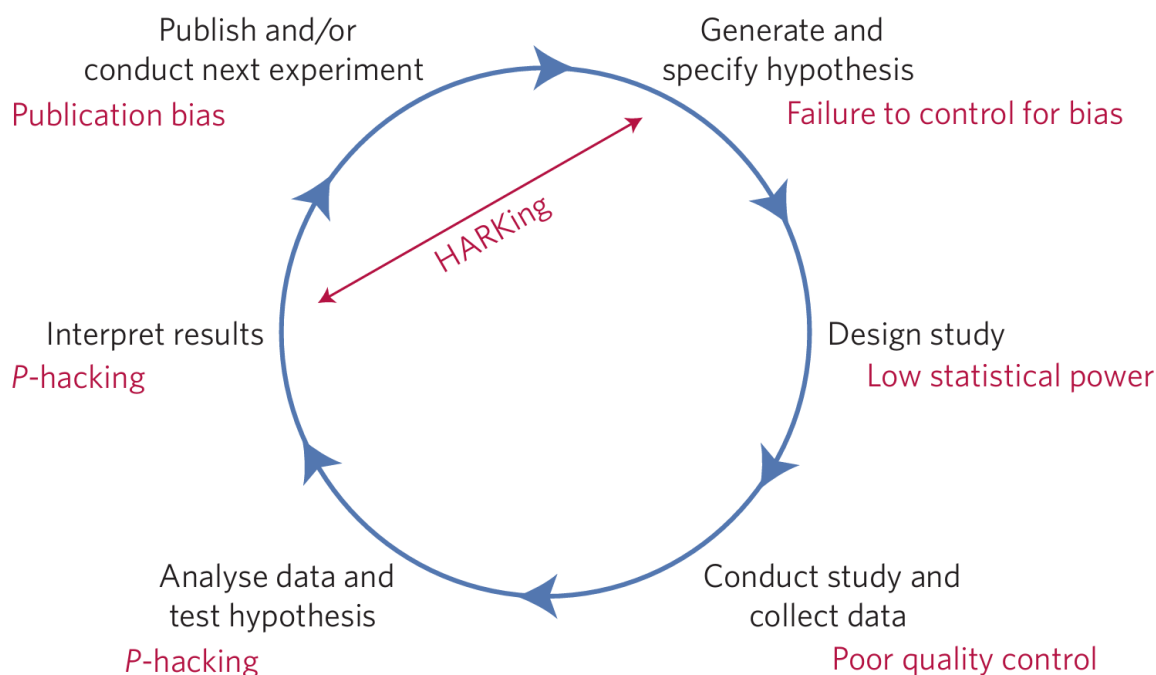


Figure 3: Threats to reproducible science across the research cycle (Munafò et.al., 2017)

Guiding questions for change agents

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1. Which barriers and drivers of reproducibility do you recognise in your own research context, and at which levels – systemic, institutional, community or individual – do they operate?
2. Which of these barriers could realistically be addressed within your institution, and which lie beyond its reach? What does this distinction imply for the scope of an RPP?
3. What motivates researchers in your context to engage with reproducibility? How could an RPP build on these existing motivations rather than relying on requirements alone?

Takeaways

- Different barriers and drivers affect adoption of reproducibility practices at systemic, institutional, community and individual level, including pressures to publish, incentive structures that reward novelty, as well as cultural factors.
- Core research integrity principles of reliability, honesty, respect, and accountability underpin reproducibility. Without internalisation of these principles, efforts to improve reproducibility will be difficult to motivate in the long term.

Further reading

ALLEA - All European Academies. (2023). *The European Code of Conduct for Research Integrity*.
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Duyx, B., Urlings, M. J. E., Swaen, G. M. H., Bouter, L. M., & Zeegers, M. P. (2017). Scientific citations favor positive results: A systematic review and meta-analysis. *Journal of Clinical Epidemiology*, 88, 92–101. <https://doi.org/10.1016/j.jclinepi.2017.06.002>.

Heesen, R. (2018). Why the Reward Structure of Science Makes Reproducibility Problems Inevitable: *The Journal of Philosophy*, 115(12), 661–674. <https://doi.org/10.5840/jphil20181151239>.

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Munafò, M. R., Nosek, B. A., Bishop, D. V. M., Button, K. S., Chambers, C. D., Percie Du Sert, N., Simonsohn, U., Wagenmakers, E.-J., Ware, J. J., & Ioannidis, J. P. A. (2017). A manifesto for reproducible science. *Nature Human Behaviour*, 1(1), 0021. <https://doi.org/10.1038/s41562-016-0021>.

Unit 3: Reproducibility interventions

Why does it matter for RPP development?

Reproducibility interventions can broadly be described as deliberate actions, policies, or changes to research practices designed to achieve the replicability and reproducibility of scientific results. As such, they form a core element of any RPP. Understanding reproducibility interventions as part of the research cycle helps identify their applicability to one's own context.

What do we need to know to take action?

It is useful to think about reproducibility interventions as a part of the research cycle. At every stage of the research cycle - study preparation, data collection, data analysis, and the dissemination of results - actions, policies, and incentive or disincentive structures can be implemented to improve research reproducibility. Likewise, appropriate reproducibility interventions are linked with the data, tools and methods used in research and can differ broadly, even within the same field of research.

However, policies and structural factors (demographic factors and availability of physical resources) cannot be categorised by their role in the research cycle; we can consider these interventions as infrastructures as they can affect reproducibility throughout the entire research cycle. To make these ideas more concrete, we will outline examples of reproducibility interventions in each category, beginning with infrastructure.

Research-performing organisations can support reproducibility by providing training in open science and reproducible research, implementing data management policies, and rewarding reproducible research practices in recruitment and promotion decisions. Research funding organisations can set requirements or incentives for reproducibility. For example, organisations that fund research can promote reproducibility by requiring data management plans or open data sharing in grant applications, by providing resources for infrastructure for open science and reproducible research, and by mandating preregistration for funded projects.

Publishers, as gatekeepers of the dissemination of research results, can establish standards for reproducibility in publications. For instance, they can introduce requirements for data and code availability statements, implementation reproducibility checklists, and by rewarding reproducible research through badges. A recent study by Miske et al. (2026) examined reproducibility in the social and behavioural sciences and found that papers published in journals with requirements for data sharing, code sharing, and reproducibility checks were more reproducible than papers published in journals lacking these requirements.

We now turn to examples of interventions that can be implemented at different stages of the research cycle. During the preparation stage, researchers can enhance reproducibility by developing a study protocol, drafting a data management plan, and preregistering the study. This helps improve transparency for potential future replication studies.

During the subsequent data collection phase, reproducibility can be supported through the use of standardised data collection procedures, the maintenance of laboratory notebooks, careful

documentation of deviations from the original protocol, and the use of standardised software packages for data capture and storage.

Further, during the data analysis stage, researchers can enhance reproducibility by converting data into interoperable formats, using controlled vocabularies or coding schemes to standardise variables, employing open-source analysis software, and applying standardised analysis methods. In addition to these measures, researchers can conduct robustness checks and independent re-analyses of results to assess the reliability of their findings and validate the data. Researchers can also record details of how the data were analysed by maintaining an analysis log or notebook.

Finally, at the dissemination stage, reproducibility can be enhanced by making research data accessible to others. This can be achieved by sharing data through appropriate repositories and by applying the FAIR principles.

Publishers and journals can also help foster reproducibility by requiring preregistration of research or for data to be available for submission. Reproducibility can also be reinforced through researchers' engagement in post-publication peer review and scholarly discussion - for example, by writing letters to editors or authors to highlight potential issues, by conducting replication studies, and by responding to requests for data reuse.

The examples of interventions discussed above are intended to improve the reproducibility of research; however, they are not equally effective, feasible, or applicable in every research context. This may be due to a range of factors, including differences in research methods across fields, variations in available resources, and institutional or disciplinary norms. Some of these challenges will be addressed in more detail later in this handbook. More detailed descriptions of particular examples of interventions across the research cycle are provided in the TRUSTparency toolbox, which provides access to a list of reproducibility interventions classified across research stages, subcategories and intervention types.

Guiding questions for change agents

1. Regardless of their effectiveness, some reproducibility interventions are more challenging to implement than others. What factors contribute to these challenges, and how might they be addressed? Reflect on potential solutions that could be included in a reproducibility promotion plan (RPP).
2. Which interventions are most likely to lead to meaningful changes in everyday research practices, rather than remaining formal or symbolic commitments?

Takeaways

- Reproducibility can be strengthened throughout the research cycle, from study preparation and data collection to analysis and dissemination, through concrete practices such as preregistration, standardisation, documentation, and data sharing.
- Infrastructure and governance matter alongside individual practices: decisions made by research performing organisations, funders, and publishers – through policies, incentives, and standards – shape reproducibility across the entire research process.

Further reading

Miske, O., et al. (2026). Investigating the reproducibility of the social and behavioural sciences. *Nature*, 652(8108), 126–134. <https://doi.org/10.1038/s41586-026-10203-5>.

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Unit 4: Stakeholder mapping for RPP development

Why does it matter for RPP development?

Developing and implementing an RPP requires input from stakeholders with different roles and perspectives in the research process. Understanding who the relevant stakeholders involved in the research cycle are and connecting them is crucial because they will also be the ones who will implement the RPP in practice. Stakeholder mapping exercises conducted in the TRUSTparenacy project can help inform your own mapping.

Stakeholder mapping also helps identify differences among stakeholder groups, in terms of access to resources, as well as assess their receptivity to and the perceived relevance of different reproducibility interventions. Moreover, stakeholder mapping helps highlight these differences, and provides a basis for identifying needs, capacities and priorities for action.

These stakeholders may also act as change agents - individuals or groups who help initiate and sustain improvements in research practices by leveraging their expertise or influence within the research ecosystem.

What do we need to know to take action?

Given the diversity of perspectives among stakeholders, a multi-stakeholder partnership approach can be supported by stakeholder mapping. (Brouwer & Woodhill 2019). According to this approach, stakeholder mapping consists of three interconnected steps: (1) identifying stakeholders, (2) analysing their roles and characteristics, and (3) considering how they should be engaged. The goal of stakeholder mapping is to create a “coalition of change agents” that can co-create an RPP that reflects the diversity of needs and perspectives across an institution.

Begin by exploring the diversity of your research environment. Identify units and stakeholder groups by research contexts and roles in fostering reproducibility. This can include disciplinary units with different research practices, as well as support and coordination roles such as data management, research support services and institutional leadership. After you have created an initial list of stakeholders, note key characteristics, and identify connections between them. Existing mappings of the structure of your institution may be helpful in this task. While this will not produce a complete overview of your institution, it will help map the key areas of difference and ensure that all relevant perspectives are represented.

Especially in large institutions with a broad profile, you may feel overwhelmed by the number of stakeholders you identify in different units. If that is the case, consider the roles and characteristics that correspond to each stakeholder group. Some may be directly affected by reproducibility interventions, while others may play enabling or decision-making roles. This will help you explicate their interests, contributions and decision-making power in fostering reproducibility in your institution. Consider which of your identified stakeholders are the most interlinked, what clusters form among stakeholders, and who may help you reach others. Where gaps are identified, participants should consider how engagement can be supported and who may help to bridge these gaps. Mapping stakeholders based on their importance and influence may also be useful to identify potential change agents.

Finally, consider appropriate ways to engage stakeholders in your settings, so as to support and facilitate the RPP creation process. Your “coalition of change” should combine practical knowledge of research processes with the capacity to support and implement institutional change. Some will take an active role in co-creating the RPP, while others may be consulted, informed or engaged at later stages. These roles may also change over time. Consider what motivates different stakeholders, and what would be necessary to ensure their involvement. In particular, the support of institutional leadership may be crucial for ensuring that staff see the co-creation process as a shared priority.

Stakeholder mapping is an iterative process which may be revisited before, during and after crafting your RPP. After you have conducted your initial stakeholder mapping, identify roles of different stakeholders and their linkages, validate the results of your mapping with a core group of stakeholders, take care to include members of different stakeholder groups (researchers, support staff, management, etc.). They may help identify additional stakeholders and linkages, and to refine your stakeholder descriptions.

Guiding questions for change agents

1. Which stakeholders are directly involved in research practices that affect reproducibility, and which play a supporting role?
2. Which research contexts, disciplines, methods or career stages are represented in your current stakeholder map, and which may be missing?
3. Which stakeholders should be part of the core “coalition of change,” and which should be consulted, informed or involved at later stages?

Takeaways

- Stakeholder mapping is a three-step process: (a) identifying stakeholders, (b) analysing their roles, their influence, and interest, and (c) deciding how each should be involved. The influence–interest matrix helps identify a “coalition of change” whose authority and knowledge can help enact an RPP.
- Stakeholder mapping is iterative. Refine your mapping by consulting with core stakeholders (your “coalition of change”) to find new stakeholders, linkages and to account for changes since your initial mapping.

Further reading

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CO-CREATE consortium. (2019). *The CO-CREATE handbook for creative professionals*. <http://www.cocreate.training/>.

Unit 5: Resources for reproducibility

Why does it matter for RPP development?

When creating an RPP, it is important to consider the research areas and reproducibility practices most relevant for your organisation, as well as the challenges associated with implementing reproducibility interventions. These challenges can be grouped into three broad categories: resources available for, receptivity to, and relevance to reproducibility (Fanelli 2026). Understanding these challenges can help selecting reproducibility interventions, which can be supported with the necessary resources. This unit focuses on the role of resources, while the next two units address receptivity and relevance.

What do we need to know to take action?

Successfully implementing reproducibility interventions requires resources such as funds, time and infrastructure. Access to these resources is often uneven, varying both across and within research institutions. Although you may have an initial sense of which resources are available and which may be required in your research context, a really comprehensive understanding typically emerges through collective reflection and discussion that draws on a range of perspectives. Recognising how resources shape what is feasible is essential for designing interventions that are realistic and well suited to a given research context. If practical constraints are not taken into account, there is a risk that an RPP will remain largely aspirational rather than actionable.

Availability of funding underlies access to other resources. Reproducibility interventions vary in financial costs, and access to funding is unevenly distributed across fields, institutions and researcher demographics. At the level of research fields, differences in access to funding can affect the feasibility of measures such as shared data infrastructures, open access publishing, or dedicated reproducibility support interventions. Inequalities also exist within and among institutions. Well-funded, large institutions may be better positioned to adopt such interventions than smaller or mainly teaching-oriented institutions, and at individual level, early-career or vulnerable researchers in precarious employment conditions often have more limited access to funding or institutional support.

Reproducibility interventions such as data documentation or code preparation may also require significant time investment, creating tension with other career pressures. Researchers may face pressure to prioritise publication output, particularly early-career researchers, while senior staff may have competing teaching, management, or supervision responsibilities; others may have limited time due to caring duties, which are likely to disproportionately fall on women, creating a gender inequity. As a result, even low-cost interventions must take existing workloads and incentive structures into account.

Finally, many reproducibility interventions depend on specific infrastructure, including data storage, software, computation and technical support. The availability of these resources can vary significantly across countries, institutions, departments and research fields. In addition, infrastructure may be available but difficult to access or navigate without dedicated support. This may result in existing services or units taking on new functions, such as the increasing role of libraries in supporting reproducibility (Schmidt et al. 2024). Addressing these gaps and

managing limited resources often requires coordination between researchers and institutional services such as IT departments, data stewards and libraries.

Guiding questions for change agents

1. How is access to resources (funding, time, infrastructure) distributed across different units, fields or career stages in your institution? How do differences in access to resources affect feasibility of reproducibility interventions?
2. Which support roles (e.g. IT, data stewards, libraries) are critical, and what is their capacity? Who is most affected by capacity limitations?

Takeaways

- Reproducibility interventions require various resources – funds, time, and infrastructure. Access to resources differs across research fields and between well- and poorly resourced institutions, and within institutions, where early-career and precarious researchers, and those with caring responsibilities, often face the tightest constraints.
- Failing to account for differences in access to resources may overestimate applicability of reproducibility interventions. Realistic planning also means accounting for the support roles (IT, data stewards, libraries) that make existing infrastructure usable, not just whether infrastructure is in place.

Further readings

Fanelli, D. (2026). *Framework to map epistemological disparities and inclusivity challenges among end-user communities*. [Not yet published]

Horbach, S. P. J. M., et al. (2025). *How to get there from here? Barriers and enablers on the road towards reproducibility in research (preprint)*. MetaArXiv.
https://doi.org/10.31222/osf.io/gx9jq_v2.

Roje, R., et al. (2023). Factors influencing the promotion and implementation of research integrity in research performing and research funding organizations: A scoping review. *Accountability in Research*, 30(8), 633–671.
<https://doi.org/10.1080/08989621.2022.2073819>.

Schmidt, B., et al. (2024). Emerging roles and responsibilities of libraries in support of reproducible research. *LIBER Quarterly: The Journal of the Association of European Research Libraries*, 33(1), 1–21. <https://doi.org/10.53377/lq.14947>.

Unit 6: Receptivity of reproducibility interventions

Why does it matter for RPP development?

The extent to which reproducibility interventions can be successfully implemented depends not only on resources, but also on how research communities are prepared to enact them. Existing knowledge, competencies, institutional culture and regulations affect both the capacity and willingness to adopt new reproducibility interventions. Where these conditions are supportive, interventions are more likely to be taken up and sustained; where they are misaligned, even well-intentioned measures may face resistance. Understanding aspects of receptivity in your research setting will help you choose appropriate interventions as you develop your RPP.

What do we need to know to take action?

Reproducibility interventions may require specific knowledge and competencies – methodological, data management or data analysis skills, for instance, to enable computational reproducibility in social sciences or to employ experimental protocols that enable reproducible data collection. Therefore, a lack of methodological and data analysis skills hinders reproducibility. For instance, Miske et al. found wide variation both in availability of data and code, and in the reproducibility of studies across different fields (Miske et al. 2026). To take another example, senior researchers or scholars in the humanities may be less accustomed to programming and to the use of data-sharing infrastructures, which can limit their ability to engage fully with reproducibility practices. Recognising gaps in existing skills is necessary to design effective interventions that address them within your RPP.

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Existing research indicates that training has a positive effect on the promotion of research integrity standards (Roje et al., 2023). Moreover, it also suggests that courses should be tailored to disciplinary or methodological needs to help participants internalise the knowledge gained through training (Roje et al., 2023). As skills may also be unevenly distributed within research groups, offering regular and tailored training on reproducibility can help enable reproducible research practices across a research unit or institution.

Researchers' ability and willingness to implement reproducibility interventions are also affected by cultural factors and incentives. Research indicates that mentors or role models help foster research integrity at individual level, while a culture that promotes transparency and organisational justice makes a difference at the organisational level (Roje et al., 2023). Likewise, cultural factors may also inhibit reproducibility. These include institutional willingness – or lack thereof – to invest in reproducibility interventions, perceived competition within research fields over research outputs, as well as broader pressures that encourage researchers to prioritise the quantity of research output over its quality (the “publish or perish” paradigm).

Data sharing practices also vary widely across disciplines (Tedersoo et al. 2021), and data sharing may also be hindered by absence of metadata and formatting standards (Fecher et al. 2015). Awareness of cultural or practical differences among research contexts is necessary to understand how feasible it will be to implement a particular reproducibility intervention.

Ethical requirements, policies, and regulations governing research vary substantially across fields, countries, and institutions, and in some cases these differences can pose challenges for

the adoption of reproducibility interventions. For instance, regulations on the sharing and reuse of certain types of data, such as data concerning human participants, limit the ability to reuse data in replication studies or make it more difficult to do so. To mention one such example, most legal frameworks (e.g., the GDPR in the EU) classify certain categories of data (such as health data or political and religious beliefs) as special and allow them to be processed only with specific safeguards. Providing guidance that enables safe and FAIR management of sensitive data can help enable their reuse.

Guiding questions for change agents

1. Where do gaps in knowledge or competencies currently limit researchers' ability or willingness to adopt reproducibility interventions, and which of these gaps could realistically be addressed within an RPP?
2. What differences do you notice among cultural attitudes toward reproducibility in your institution? What would be necessary to address these differences?

Takeaways

- Receptivity toward reproducibility interventions is shaped by available knowledge, skills and competencies (e.g., data management and analysis skills), and the incentives, cultural disposition and regulations of a research context. Gaps in competencies are often field-specific.
- Reproducibility training can increase receptivity. Existing work indicates that training should be tailored to disciplinary and methodological needs to be most effective.

Further readings

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Rethlefsen, M. L., et al. (2022). Interdisciplinary Approaches and Strategies from Research Reproducibility 2020: Educating for Reproducibility. *Journal of Statistics and Data Science Education*, 30(3), 219–227. <https://doi.org/10.1080/26939169.2022.2104767>.

Unit 7: Relevance of reproducibility interventions

Why does it matter for RPP development?

In developing an RPP, attention should be paid not only to available resources and stakeholder receptivity, but also to the contextual relevance of different interventions. The relevance of reproducibility interventions can differ markedly between different epistemic contexts of research. This is affected by the stability of the research phenomena, the diversity in methods applied across research contexts, and the philosophical compatibility of the research framework with reproducibility.

What do we need to know to take action?

Phenomena studied in empirical fields vary widely in their properties, particularly to the extent to which they are subject to change over time, space, or both. Stability of the research phenomena refers to these differences. As a result, there is a considerable variability in the cost effectiveness and applicability of reproducibility interventions. For example, research phenomena in cognitive psychology (e.g., studies on the perception of optical illusions) are generally less susceptible to change than phenomena in political psychology (e.g., research on voting behaviour) or social psychology. As a result, data reuse may be less valuable in political psychology than in cognitive psychology, chemistry, and other fields that study relatively more stable phenomena. This also implies that there may be considerable variation in the reproducibility of research across different disciplines.

Another practical challenge to replicability and reproducibility is the lack of homogeneity or diversity of research methods and data both among and within research fields. Research fields vary substantially regarding the methods they use and the extent to which these methods are codified. In some fields—such as experimental physics, molecular biology, or parts of cognitive psychology—research practices are relatively more codified, standardised protocols are widely shared, and there is relatively strong agreement about what constitutes valid evidence. In contrast, other areas, such as social anthropology or certain branches of political psychology, often rely on more context-sensitive methods, interpretive frameworks, and evolving theoretical assumptions, leading to lower levels of methodological uniformity.

This, in turn, means that different fields rely on different standards of evidence quality and methodological consistency. Moreover, as methodologies and standards evolve, this also applies to different types of research within research fields. Therefore, replicability-enhancing interventions, such as preregistration or data sharing, are unlikely to be equally applicable or beneficial across all research contexts. For instance, methods, software, data, instruments, theories and other aspects of research design all affect the suitability of reproducibility interventions, and the kinds of replication they enable, such as re-analysis of the same data or a conceptual replication of an existing study. In digital humanities, existing methods for text analysis can be reapplied with digital texts and tools, either to replicate research with the same data, or to test new data, research questions or approaches (Schöch 2023).

Finally, the relevance of different reproducibility interventions might be affected by what may be called philosophical compatibility. Some researchers endorse ontological and epistemological frameworks that are incompatible with conventional notions of reproducibility.

Scholars working within interpretivist, constructivist, or certain qualitative traditions argue that research findings are inherently situated, meaning-dependent, and context-bound, and therefore cannot be meaningfully reproduced as expected in experimental or positivist research.

This is particularly challenging for intrinsically subjective, interpretive research methods or open-ended and exploratory methods that do not seek reproducibility as a standard of research quality. For instance, in anthropology, autoethnographic research draws insight from the researcher's own experiences of ethnographic phenomena that cannot be reconstituted by another researcher. Whether reproducibility is truly meaningless in such contexts remains the subject of ongoing scholarly debate; however, researchers who hold these views may be unreceptive and/or unable to implement, or unwilling to adopt reproducibility interventions, thereby creating inequities across different research fields in the case implementation of reproducibility interventions is imposed in a horizontal manner.

Guiding questions for change agents

1. What characterises the research phenomena in your research context? How does the diversity in research phenomena affect the applicability of reproducibility interventions?
2. Where might reproducibility interventions risk being perceived as irrelevant or incompatible with existing research practices, and how can the RPP acknowledge these differences while still promoting fair and context-sensitive interventions for reproducibility?

Takeaways

- The relevance of reproducibility interventions for a research context depends on how methods, data and tools enable different forms of research reproduction. Reproducibility interventions may be more applicable in contexts where research phenomena are stable or methods are highly codified.
- In interpretivist, constructivist, and some qualitative research traditions, findings are treated as situated and meaning-dependent, and reproducibility may have limited relevance as a standard. This can affect stakeholder engagement and create uneven adoption across fields.

Further reading

Reproducibility and replicability of qualitative research: an integrative review of concepts, barriers and enablers Nicki Lisa Cole, Sven Ulpts, Agata Bochynska, Eva Kormann, Matthew Good, Barbara Leitner, Tony Ross-Hellauer https://osf.io/preprints/metaarxiv/n5zkw_v1.

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<https://doi.org/10.1080/08989621.2020.1720659>.

Unit 8: Summary

Why does it matter for RPP development?

Units 1–7 of this handbook have introduced key reproducibility concepts, contextual factors affecting reproducibility, and co-creation tools necessary to begin developing an RPP.

This unit discusses how to mobilise this groundwork for the preparation step of RPP development described in the TRUSTparency RPP creation and implementation guide – from securing a mandate to identifying the change agents. The unit concludes by bridging the training materials to other project materials that directly support drafting the RPP itself – the *How-to guide*, the *Primer* and the *RPP template*.

What do we need to know to take action?

The TRUSTparency *How-to guide* for RPP creation and implementation structures the RPP process as a six-step cycle: Prepare, Create, Execute, Assess, Institutionalise, and Repeat. The preparation step consists of 1) securing a mandate, 2) diagnosing which reproducibility interventions are currently in place and which are lacking, 3) assessing readiness to develop and implement the RPP and 4) identifying the right people to form the coalition of change.

Diagnosis asks what reproducibility currently looks like in your organisation: how it is understood, what stands in its way, and what is already being done to support it. A shared vocabulary of reproducibility and its differences across research contexts (Unit 1) lets stakeholders build mutual understanding. Mapping barriers and drivers of reproducibility (Unit 2), as well as the interventions already in place (Unit 3), completes the picture, showing existing interventions and gaps. Diagnosis also considers the resources an intervention demands, the receptivity of the research communities expected to adopt it, and its relevance given the phenomena, methods and philosophical assumptions involved (Units 5-7). Weighing gaps against these factors helps select interventions that can be implemented, rather than remaining aspirational. If you have worked through these activities, some of their outputs can be used as a first draft for this diagnosis.

Assessing readiness involves three considerations: the support the process can rely on, the capacity available to sustain it, and the point at which it should begin. Budget and time resources cannot be established through this training itself. However, mapping barriers and drivers, as well as existing interventions and resources helps identify which parts of the organisation are most in need of change and most ready to engage with it.

Identifying the right people involves assembling a coalition of change able to carry the process forward: those with the authority to enact an RPP, and those with the knowledge and commitment to make it credible. The stakeholder mapping and influence- engagement matrix (Unit 4) show who holds each, and can guide how to approach different stakeholder groups based on their influence and engagement in fostering reproducibility. A separate TRUSTparency output on stakeholder mapping can also help guide this process.

The preparation element not addressed in earlier units is the mandate. Before the RPP process begins, it should have backing from senior management, making the RPP an institutional priority. The leadership support is what gives the process legitimacy, allocates resources, and

helps engage stakeholders across the organisation. Securing this mandate also means clarifying the scope and decision-making authority of the process: participants should understand what the RPP aims to achieve, what influence they will have, and how the outcomes will be supported institutionally.

With the preparatory elements in place, the process moves to drafting the RPP itself, supported by the other TRUSTparenCy resources: the *How-to guide*, the *Primer*, and the *RPP template*. Consult these materials, along with other materials in the TRUSTparenCy toolbox for guidance in drafting the RPP, and a fuller catalogue of interventions and resources. Related projects such as iRISE, TiER2 and OSIRIS, along with resource libraries such as the UK Reproducibility Network, Carpentries workshops and others offer additional guidance suited to methods, data types or research fields.

Guiding questions for change agents

1. Who in your institution could provide the mandate for an RPP process, and what would demonstrate its value to these stakeholders?
2. What would you need to know about your institution's budget, leadership support, or capacity that you do not currently know – and who could tell you?
3. Which results of previous activities in this training would you trust as an input for drafting your RPP, and which would you want to revisit or recreate with a wider group?

Takeaways

- A mandate from senior management, clarifying the scope and decision-making authority of the process, is required to create an effective RPP, and should be secured before drafting begins.
- This training provides a shared understanding of reproducibility, its barriers and drivers, and the factors shaping the viability of interventions, together with concrete outputs that support the preparatory phase of RPP development.
- Further work should draw on the TRUSTparenCy toolbox and the RPP How-to guide, Primer, and Template. Consult other resources that provide tools, training or guidance on specific aspects of reproducibility as relevant for your research context.

Further reading

Pedersen, A. V., & Sørensen, M. P. (2026). How to Create and Implement a Reproducibility Promotion Plan (RPP). [Not yet released]

Pedersen, A. V., & Sørensen, M. P. (2026). A map of disparities across stakeholders, institutions, and national regulations. [Not yet released]

TRUSTparenCy project. *TRUSTparenCy toolbox*. [Not yet released] <https://trustparenCy-project.eu/>.

SOPs4RI project. *Toolbox for Research Integrity*, v5.0. <https://sops4ri.eu/toolbox/>.

TiER2 project. *Library*. <https://tier2-project.eu/library>.

UK Reproducibility Network. *Resources*. <https://www.ukrn.org/resources/>.



TRUSTparency trainer's guide

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Artificial Intelligence Use Disclosure

Generative AI tools were used during the preparation of this trainer's guide exclusively to improve the grammar, syntax, and stylistic flow of the text. Final editorial control and responsibility for the content remain entirely with the authors.

Introduction

Creating a reproducibility promotion plan (RPP) is a structured process of identifying, prioritising, and agreeing on actions that can strengthen reproducible research practices within an institutional context. RPP development is a collaborative process that brings together key stakeholders to reflect on current practices and to make deliberate choices about applying feasible and meaningful new reproducibility interventions.

The facilitator of this process plays a central role in building a coalition of change, i.e. a team of employees from the institution that wishes to promote reproducibility that has the knowledge, resources, and – ideally but not necessarily – administrative leverage to co-create and implement an RPP. Effective facilitation helps ensure that stakeholders recognise shared challenges and reach workable compromises, especially when perspectives or levels of influence differ. The facilitator's task is not to provide ready-made solutions, but to guide discussion throughout RPP development. This includes planning the process, structuring discussions and activities, supporting reflection and idea generation, helping prioritise actions, and building support for implementation.

Reproducibility is shaped by many stakeholders across the research system, and an RPP will only be effective if it reflects the perspectives and needs of those involved. Co-creating the RPP with relevant stakeholders (change agents) supports legitimacy and long-term commitment, while helping balance competing priorities. **TRUSTparenacy training supports change agents in building the knowledge and skills needed to guide and facilitate this process.**

Facilitating the RPP development process

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Change agents are individuals or small teams who take an initiating role in RPP development. They may be researchers, research support staff, managers, or policy officers, and they do not necessarily hold formal authority. Their role is to enable dialogue among stakeholders and translate shared understanding into concrete priorities and actions. TRUSTparenacy has created a set of training materials to help the RPP co-creation process, including a study handbook, handouts, and a trainer's guide. This training material introduces practical activities that support RPP co-creation by equipping change agents with facilitation approaches and reflective tools.

To fulfil this role effectively, facilitators must maintain neutrality and cultivate trust, particularly where differences in seniority or institutional power are present. While facilitation may be undertaken by someone initiating the RPP process, effective co-creation may require specific skills in group dynamics. Change agents should therefore consider whether suitable facilitation expertise is available internally or whether additional support is needed.

Preparation is critical. Before bringing stakeholders together, facilitators should clarify the mandate, scope, and decision-making authority of the participants of the RPP process. Co-creation requires time and effort, and participants should clearly understand what the RPP aims to achieve, what influence they will have, and how the outcomes will be supported institutionally.

Throughout the activities, participants will be asked to work in small groups. These activities benefit from diverse groups representing different roles and research contexts. Especially in

larger groups, facilitators should allow sufficient time for introductions to allow effective group formation.

Knowledge and skills for promoting reproducibility

Developing an institutional RPP requires a shared foundation of knowledge about reproducibility and research integrity principles, an understanding of the role different contexts play in enabling reproducibility, and essential co-creation skills. Research indicates that implementation of responsible research practices is affected by personal values and motivation, alongside broader factors such as institutional culture. Individual factors include the internalisation of values, role of mentors and access to research integrity training. Institutional factors likewise include transparency, regularly updated research integrity policies and ability to provide training (Roje et al., 2023). The TRUSTparenacy training will equip participants with the knowledge, skills and attitudes to identify the effects of these factors in their own work and institution, and to set actionable goals toward greater reproducibility.

Previous research also indicates that training on reproducibility should be available to all stakeholders (Labib et al., 2022). The TRUSTparenacy training will address this through the RPP co-creation process. However, this can be challenging, particularly when engaging stakeholders across hierarchical boundaries, such as between researchers and management. To identify relevant issues for all stakeholders in the RPP development process, it is necessary to understand different stakeholders' motivations and to equip them with the co-creation skills necessary for mutual learning and problem-solving.

The knowledge and skills strengthened through the training are:

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- Understanding of different conceptions of reproducibility at the individual, institutional and research community levels
- Understanding barriers and drivers of reproducibility
- Ability to identify and apply appropriate and feasible reproducibility interventions within a given research context
- Ability to identify structural reproducibility challenges based on shared experiences
- Ability to collectively prioritise key themes and interventions for development of an institutional RPP

Activity 1: Understanding reproducibility

Type of activity	Introductions and case discussion
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) describe how research context affects perspectives on reproducibility 2) identify how their own understanding of reproducibility may differ from others' based on research context.

Purpose

This activity introduces the central terms used in discussions on reproducibility. Participants explore these concepts by discussing cases drawn from different research fields. The activity also helps participants share their perspectives of reproducibility, identifying how different understandings are shaped by participants' research context.

Procedure

1. Prepare handouts and case cards for group work. No additional materials are required, though note-taking equipment may be useful.
2. [15 minutes] Begin with a brief presentation on definitions of reproducibility. Introduce key terms based on the [IRISE glossary](#), and the idea that understandings of reproducibility differ widely between research contexts, methods and disciplines.
1. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group) and allocate several cases to each team. The number of cases per group should depend on the total number of groups. Feel free to mix cases from different research fields when assigning them to groups; combining cases from various fields can enrich discussion and bring diverse perspectives.
2. [15 minutes] First, within their small groups, participants take turns introducing themselves, by sharing their name, their role in research, and what reproducibility means to them.
3. [40 minutes] Then, participants should turn to discussing the assigned cases.
4. [15 minutes] The small groups present the results of their discussions to the whole group, focusing on the similarities and differences in how reproducibility was understood within the group.

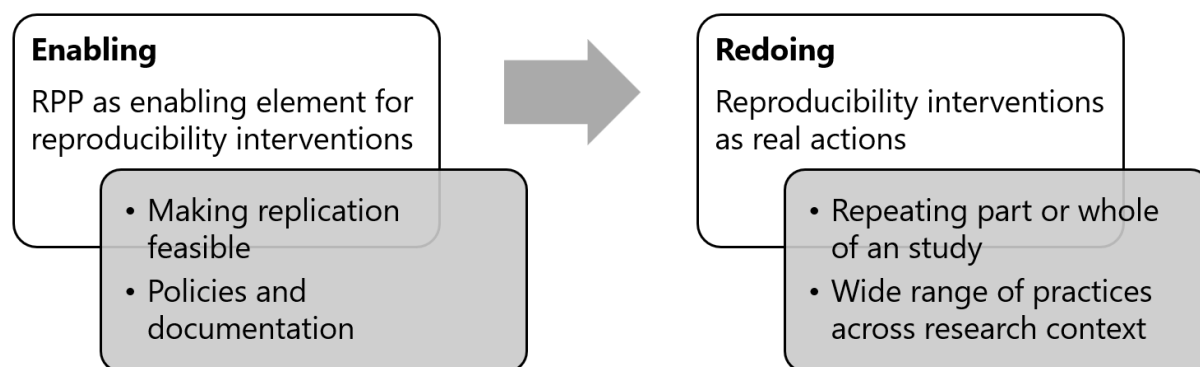
Resources and equipment

→ Printed or digital case cards and Handout 1

Handout 1

Takeaways

- Definitions of reproducibility can differ among research contexts and researchers. Core concepts include replicability of study design, which makes research reproducible by enabling replication studies to recreate their findings. Establishing a shared understanding is integral for co-creating an actionable RPP.
- Reproducibility practices can be seen as enabling and redoing practices. Developing the RPP enables reproducibility interventions to be implemented effectively.



Enabling and redoing in reproducibility (based on Ulpts & Schneider 2025).

About this activity

During the group work you will reflect on what reproducibility means in your work and learn how others may understand the concept differently based on their research field, methods, and experiences. Through case discussions, you will explore a range of viewpoints and compare them with your own. By making the similarities and differences visible, the activity helps build a foundation for collaboration throughout the RPP development process. The aim is not to agree on a single definition of reproducibility, but to become familiar with a shared set of terms and concepts that will be used in the training activities.

Supplementary material: Key reproducibility terms

A shared vocabulary related to reproducibility may be helpful in discussing different stakeholders' perspectives. We suggest using the definitions provided in the [iRISE glossary](#)¹ of reproducibility terminology. Key definitions that may be useful for the activity include:

Replicability is the extent to which the design, implementation, analysis, and reporting of a study enable a third party to repeat the study and assess its findings.

A **replication study** is a study that repeats all or part of another study and allows researchers to compare their findings.

Reproducibility is the extent to which the results of a study agree with those of replication studies.

Direct replication or **full replication** is a study where researchers repeat the entire study to assess its findings, using a procedure that provides no a priori reason to expect a different outcome.

Partial replication is a study where only parts of a study are replicated.

Conceptual replication is an attempt to test the same fundamental idea or hypothesis of the original study, while some aspects of the replication study differ.

Computational reproducibility is the ability of reported results to be reproduced by repeating the same computational steps (e.g. data processing and statistical analyses) on the original data. It has also been referred to as **analytical reproducibility**.

¹ Voelkl, B., Heyard, R., Fanelli, D., Wever, K., Held, L., Würbel, H., Zellers, S., & Maniadis, Z. (2024). Glossary of common terminology resulting from scoping reviews (iRISE Project Deliverable). European Union Horizon Europe Programme. <https://osf.io/br9sp/files/ewybt>.

Case cards

Medicine and Life Sciences 1

Research team A conducts a clinical study to evaluate whether a specific blood-based biomarker can be used to detect early pancreatic cancer. In their publication, they describe in detail the inclusion and exclusion criteria, the clinical setting, and the laboratory procedures used to analyse the blood samples. They also provide the exact assay protocol, the calibration procedures of the equipment, and the full statistical code used for evaluating diagnostic accuracy. Team A has also made its original dataset available, and independent researchers are able to reproduce the published statistical results using the shared data and code.

Research team B, working in another university hospital, decides to repeat the study as closely as possible. They report that they were able to follow the published protocol without any difficulties, as all necessary steps had been described clearly and precisely. After collecting and analysing data from a comparable patient population, however, they find that the biomarker performs poorly and cannot distinguish between patients with and without cancer. The results differ substantially from those reported by team A.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Medicine and Life Sciences 2

A research team develops a statistical model to predict recovery following stroke. In their publication, they provide a detailed description of the model structure, the variables included, all preprocessing steps, variable selection procedures, and the complete analysis code used to fit and evaluate the model. Although patient-level data cannot be shared because of privacy restrictions, all analytical procedures are documented in sufficient detail to allow others to repeat the modelling process.

Another research group undertakes a study focusing only on the data-analysis component of the original work. Using a comparable dataset collected at a different hospital, they implement the same preprocessing procedures, variable selection strategy, and statistical model described in the original publication. The searchers report that the documentation provided all information needed to carry out the analysis without uncertainty or the need for additional assumptions. Their model achieves predictive performance that is very similar to that reported in the original study and identifies largely the same predictors of recovery.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Medicine and Life Sciences 3

Research team A conducts a multi-centre clinical trial to evaluate whether a newly developed drug reduces the frequency of migraine attacks. The authors carefully describe their inclusion and exclusion criteria, the clinical protocol followed at each site, the dosage and timing of the medication, and the method used to record migraine frequency through patient diaries. They also provide statistical scripts that specify the regression models used to estimate treatment effects. However, due to patient confidentiality concerns, the underlying dataset is not publicly available, and only aggregated summaries are shared.

To evaluate the same finding reported by team A, a research team in another country conducts a new clinical trial that closely follows the original study. They recruit a new group of patients with similar characteristics, administer the drug using the same dosage schedule, collect outcomes using the same patient diary procedures, and analyse the data using the methods described in the original publication. The researchers report that the original publication was sufficiently detailed and that they were able to implement all aspects of the study without difficulty. After completing the trial, they observe a reduction in migraine frequency among treated patients. However, the effect size is notably smaller than in the original report, and when they apply alternative but widely accepted statistical approaches for analysing repeated measurements, the effect is no longer statistically significant. The researchers conclude that the findings may depend to some extent on analytical choices.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

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Natural Science 1

A materials science group investigates the thermal conductivity of a newly developed alloy. They provide a comprehensive description of their experimental setup, including the geometry of the sample, the measurement apparatus, calibration procedures, and environmental conditions such as temperature and humidity. The authors also share raw measurement data and scripts used to calculate conductivity values.

Another laboratory reconstructs the experiment using the same type of apparatus and follows the described procedures step by step. The researchers report that the documentation was sufficiently detailed to implement every aspect of the measurement. Nevertheless, their measurements yield consistently lower conductivity values across all tested temperatures, leading to conclusions that are not consistent with the original findings.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Natural Science 2

In an ecological study, researchers report a strong association between soil nitrogen levels and plant species diversity in a specific region. They describe the general approach to sampling but omit precise information about the spatial layout of sampling sites and details about instrument calibration.

A second team conducts a related study in a comparable ecosystem and applies the same statistical analysis to their own data. Although they cannot reproduce every step of the original sampling procedure due to missing information, they observe a similar relationship between soil nitrogen and plant diversity. They note, however, that several aspects of the original methodology remain unclear.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Natural Science 3

A computational chemistry study investigates molecular interactions using numerical simulations. The authors provide all simulation input files, parameter settings, and scripts used to generate the results.

Another research group reruns the simulations using the provided materials. They obtain the same outputs, including molecular configurations and numerical results, without needing to modify any part of the computational workflow.

Questions:

- 1) Can this case be considered an example of replication? If yes, what type of replication does it represent? If not, what term would more accurately describe it?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) Does this case provide evidence about reproducibility as defined in the handout? Why or why not?

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Natural Science 4

A laboratory-based chemistry study reports that introducing a specific catalyst significantly increases the rate of a chemical reaction. The authors provide a detailed description of the experimental setup, including reaction temperatures, concentrations, and measurement techniques. However, certain practical aspects of laboratory work, such as the exact purity of reagents, supplier differences, environmental conditions, glassware cleaning procedures, mixing order and the timing between preparation steps, are only briefly mentioned or omitted.

A second laboratory attempts to follow the protocol as closely as possible. Their researchers report that most aspects of the experiment are clearly described, but they must make reasonable assumptions about some of the unstated details. When they perform the experiment, they consistently observe an increase in reaction rate when the catalyst is used. However, the magnitude of the increase varies across repeated runs and is generally smaller than that reported in the original study. The variability suggests that minor differences in experimental conditions may play a role.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Social Science 1

Research team A publishes a study claiming that a short mindfulness intervention improves working memory performance in university students. The paper includes detailed intervention scripts, instructions given to participants, criteria for including and excluding participants, and the full analysis code.

Research team B implements the same intervention at a different university using a similar student population. They report that the study procedures were easy to replicate because the original publication provided all necessary information. However, after analysing their data, they find no evidence that the intervention improves working memory. Their results contradict the original findings.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Social Science 2

A study reports that increased social media use is associated with higher levels of political polarisation. The authors provide a detailed description of their data collection procedures, variable definitions, coding rules, data-cleaning steps, handling of missing responses, and statistical modelling strategy. They also make the analysis code publicly available, allowing other researchers to understand exactly how the original analyses were conducted.

Another research team decides to repeat only the data-analysis component of the study. Using a separate dataset collected from a comparable population and containing equivalent measures of social media use and political polarisation, they apply the same data-cleaning procedures, variable coding rules, and statistical models described in the original publication. The researchers report that the original methods were documented clearly and that no important analytical decisions had to be inferred or guessed.

After completing the analysis, however, they find results that differ substantially from those reported in the original study. The estimated association between social media use and political polarisation is very small and statistically indistinguishable from zero. Despite closely following the analytical procedures of the original study, the researchers are unable to obtain findings that support the original conclusion.

Questions:

- 1) What type of replication is described in the case?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) How would you assess the study's reproducibility?

Social Science 3

A political science study analysing survey data shares the raw dataset, detailed data cleaning procedures, and the full analysis code used to generate the results. The documentation also explains how each variable was constructed.

A third-party researcher runs the code exactly as provided. All numerical results, tables, and figures match those in the publication, and no discrepancies are observed at any stage of the analysis.

Questions:

- 1) Can this case be considered an example of replication? If yes, what type of replication does it represent? If not, what term would more accurately describe it?
- 2) How would you assess the study's replicability? If it could be improved, describe how.
- 3) Does this case provide evidence about reproducibility as defined in the handout? Why or why not?

Activity 2: Enabling reproducibility

Type of activity	Group work for developing a “Rich Picture” on barriers and enablers of reproducibility
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) analyse system-level, institutional, and individual factors that shape reproducibility 2) identify key barriers and enablers affecting the uptake of reproducible research practice 3) generate shared insights that can inform RPP development.

Purpose

This activity aims to help participants develop a shared and explicit understanding of the factors that enable reproducibility in their organisational context by collectively exploring barriers and enablers across system-level, institutional, and individual dimensions.

By making these dynamics visible through a [Rich Picture approach](#), the activity supports structured reflection and generates concrete insights that can guide priority setting and choices in RPP development.

Procedure

1. Prepare materials for group work: handouts, large sheets of paper and coloured markers. No predefined templates are required, as participants will work with a Rich Picture approach that allows free-form visual representation.
2. [15 minutes] Begin with a short presentation on barriers and enablers of reproducibility, linked to Unit 2. Introduce the [Rich Picture approach](#), emphasising that it is a participatory method designed to reveal complexity rather than to produce a linear or exhaustive list:
 - there is no “correct” way to draw the picture,
 - visual elements can represent actors, barriers, enablers, constraints, tensions, incentives, emotions, power relations, uncertainties etc.,
 - the goal is to reveal complexity, not to produce a polished diagram.
3. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group).
4. [15 minutes] Each group collaboratively starts creating a Rich Picture by illustrating barriers to reproducibility at different levels. Participants are encouraged to focus on real and experienced barriers, rather than listing all theoretically possible obstacles. They may depict how barriers interact, reinforce one another, or affect different actors.
5. [20 minutes] Once key barriers are visualised, groups extend their Rich Picture by adding potential enablers of reproducibility that could realistically address the barriers shown, such as incentives, nudges, or other practical changes that could be implemented in their institution. Visual cues such as arrows, annotations, or colour-coding can be used to show how enablers relate to barriers.

Groups are prompted to consider:

- 1) What could help shift a barrier without waiting for large-scale system reform?
- 2) Who would need to act for this change to be effective?
- 3) What assumptions do these enablers rely on (e.g. leadership support, resources, skills)?

6. [20 minutes] Ask the participants to reflect on the Rich Picture they have created and prioritise the main elements. This can be done by circling, highlighting, or adding symbols to the Rich Picture. Within each group, participants identify and mark:
 - barriers perceived as most entrenched in their context,
 - impactful enablers that are within reach at organisational level.
7. [15 minutes] Each group briefly presents their Rich Picture, focusing on the most significant barriers and the most promising enablers identified. Facilitate discussion to explore common patterns and differences across groups. Consider how these are affected by differences in research context.

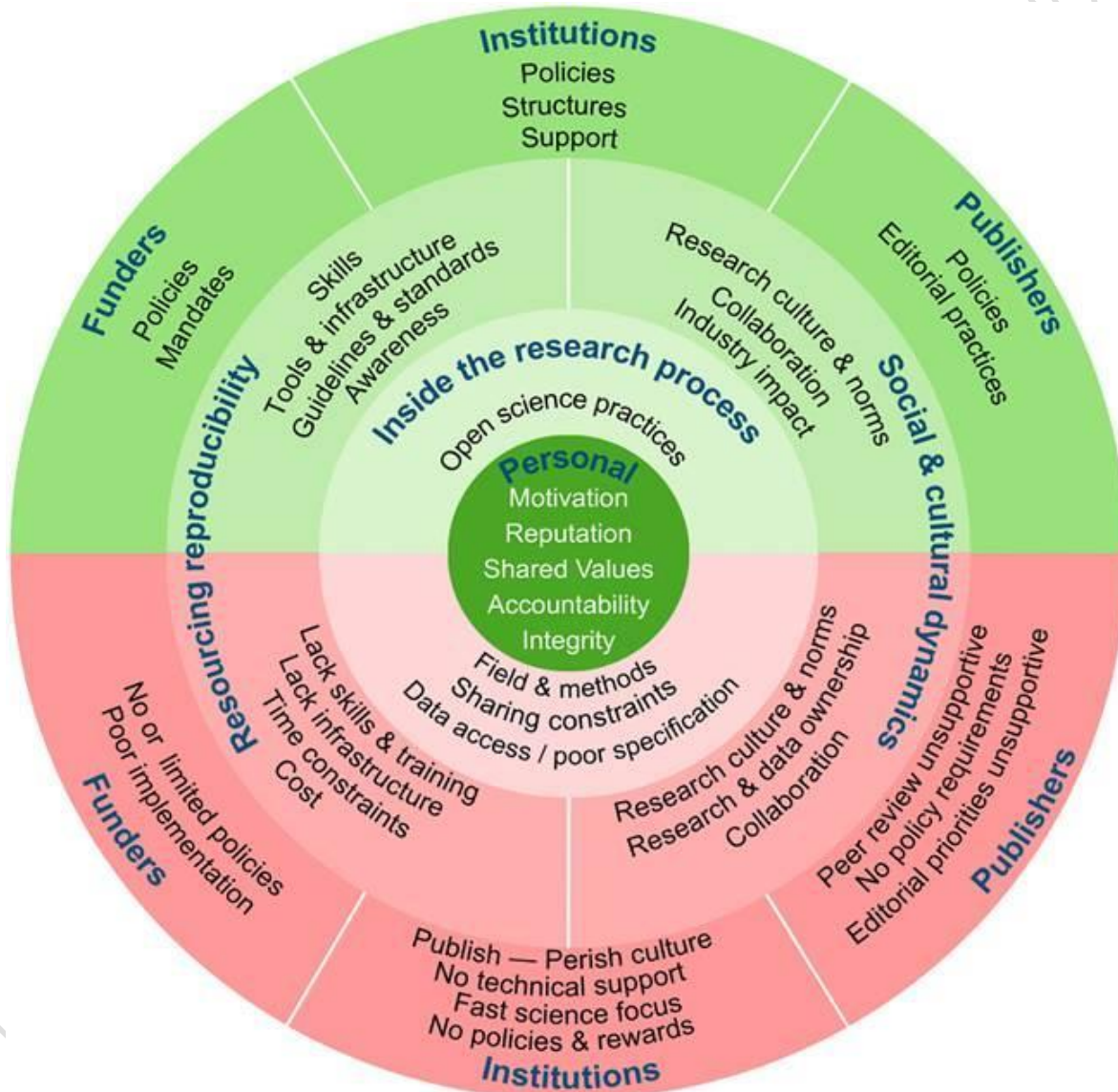
Resources and equipment

- Large sheet of paper for each group
- Coloured markers
- Printed or digital Handout 2

Handout 2

Takeaways

- Different barriers and drivers affect adoption of reproducibility practices at systemic, institutional, community and individual level, including pressures to publish, incentive structures that reward novelty, as well as cultural factors and personal motivation, including ethical, intellectual, reputation and efficiency concerns.
- Core research integrity principles of reliability, honesty, respect, and accountability underpin reproducibility. Without internalisation of these principles, efforts to improve reproducibility will be difficult to motivate in the long term.



Visual synthesis of barriers and facilitators of reproducibility across research ecosystem layers (Kozula et.al. 2026)

About this activity

This activity will help you explore the factors that facilitate or challenge reproducibility in your own research environment. Working with others, you will create a visual Rich Picture that captures the people, processes, resources, and conditions that influence reproducibility in practice. As you share experiences and ideas, you will identify barriers, enablers, and the connections between them. Developing a Rich Picture does not require artistic skills. Using drawings, symbols, keywords, arrows, and simple sketches, your group will work together to represent how reproducibility is experienced in your research context. The focus is on capturing ideas and relationships, not on creating a polished diagram. The visual approach allows you to express complex situations that can be difficult to describe with words alone. By building the Rich Picture together, you will gain a deeper understanding of the factors affecting reproducibility and develop a shared view of the context in which improvements can be made.

Supplementary material:

Examples of barriers and drivers at different levels

System or institution level: Pressure to publish

Hiring and promotion decisions are often tied to publication volume and journal prestige. Activities such as documenting workflows, publishing protocols, or sharing data go largely unrewarded. Researchers feel compelled to prioritise fast, publishable results over transparent, reproducible practices, but the incentive structure makes it difficult to prioritise reproducibility.

Community level: Culture of openness

In some research communities, sharing data, materials, and methods is a strongly enforced collective norm rather than an individual choice. Growing public visibility of research and societal expectations of trust are reinforcing this shift, extending communal norms of openness into fields where they are not yet the default.

Researcher level: Efficiency

Clear documentation and accessible data or code save time in the long term. It lets researchers retrace their steps months or years later and share methods and workflows with collaborators more effectively. Some also see well-documented outputs as more likely to be adopted and cited by others.

Activity 3: Evaluating existing reproducibility interventions

Type of activity	Group work combining structured discussion and visual mapping
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) describe what reproducibility interventions are currently enacted in their institutions 2) assess to what extent existing resources address needs identified in the Rich Picture 3) identify intervention gaps to inform RPP development.

Purpose

This activity supports participants in developing a shared understanding of their current institutional landscape of reproducibility interventions.

Drawing on the catalogue of reproducibility interventions collected by the TRUSTparenacy project, participants will identify what reproducibility interventions are already being enacted within their institution, which aspects require further attention, and where realistic starting points for change may lie.

Procedure

1. Prepare materials for group work: handouts, large sheets of paper and coloured markers.
2. [15 minutes] Begin with a short presentation on reproducibility interventions and their categorisation, linking to Unit 3. Introduce the purpose of the activity - to map what is already in place at the institutional level, rather than to design new interventions. Remind the participants that reproducibility interventions may exist in formally and informally and may differ across disciplines. Emphasise that the goal is not to evaluate the effectiveness of interventions in detail, but rather to build a shared picture of existing interventions and gaps.
3. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group). Each group uses a template for structuring the discussion (found in the handout materials) and the TRUSTparenacy catalogue of reproducibility interventions.
4. [40 minutes] Groups then fill in the table and discuss and annotate their list to evaluate the extent to which existing interventions address needs identified in the Rich Picture during Activity 2, in what research contexts, and what the gaps are.
5. [15 minutes] Group presentations - each group presents a brief summary of key existing interventions identified and major gaps.
6. [15 minutes] Facilitated discussion focusing on areas of potential strengthening reproducibility interventions.

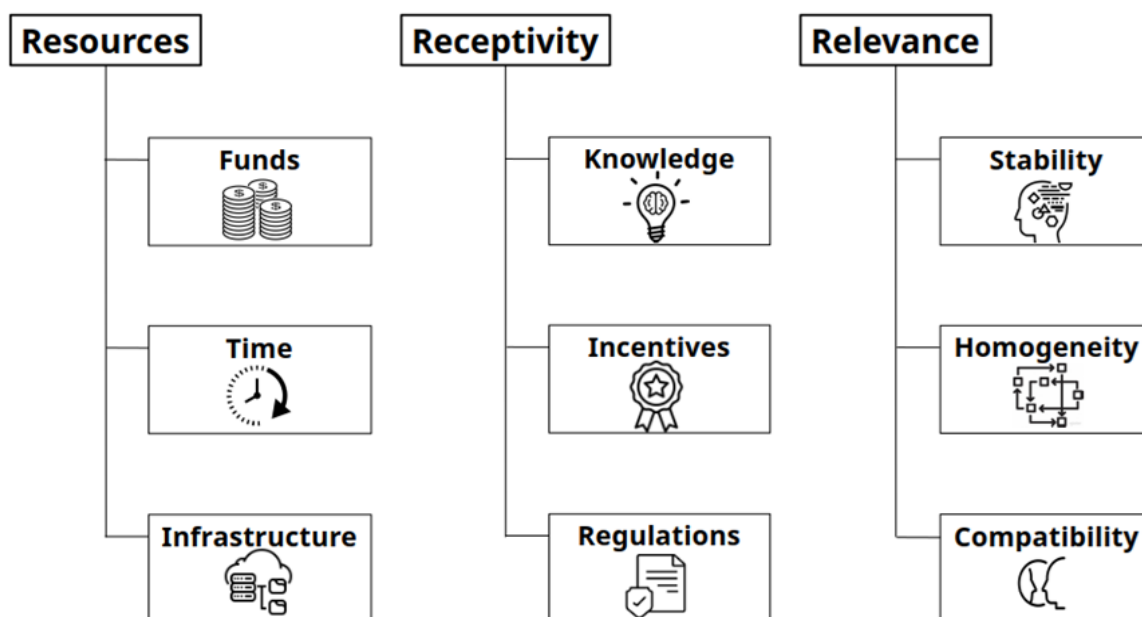
Resources and equipment

- Table for structuring the discussion for each group
- TRUSTparenacy catalogue or reproducibility interventions
- Coloured markers
- Printed or digital Handout 3

Handout 3

Takeaways

- Reproducibility can be strengthened throughout the research life cycle, from study preparation and data collection to analysis and dissemination, through concrete practices such as preregistration, standardisation, documentation, and data sharing.
- Infrastructure and governance matter alongside individual practices: decisions made by research performing organisations, funders, and publishers - through policies, incentives, and standards - shape reproducibility across the entire research process.

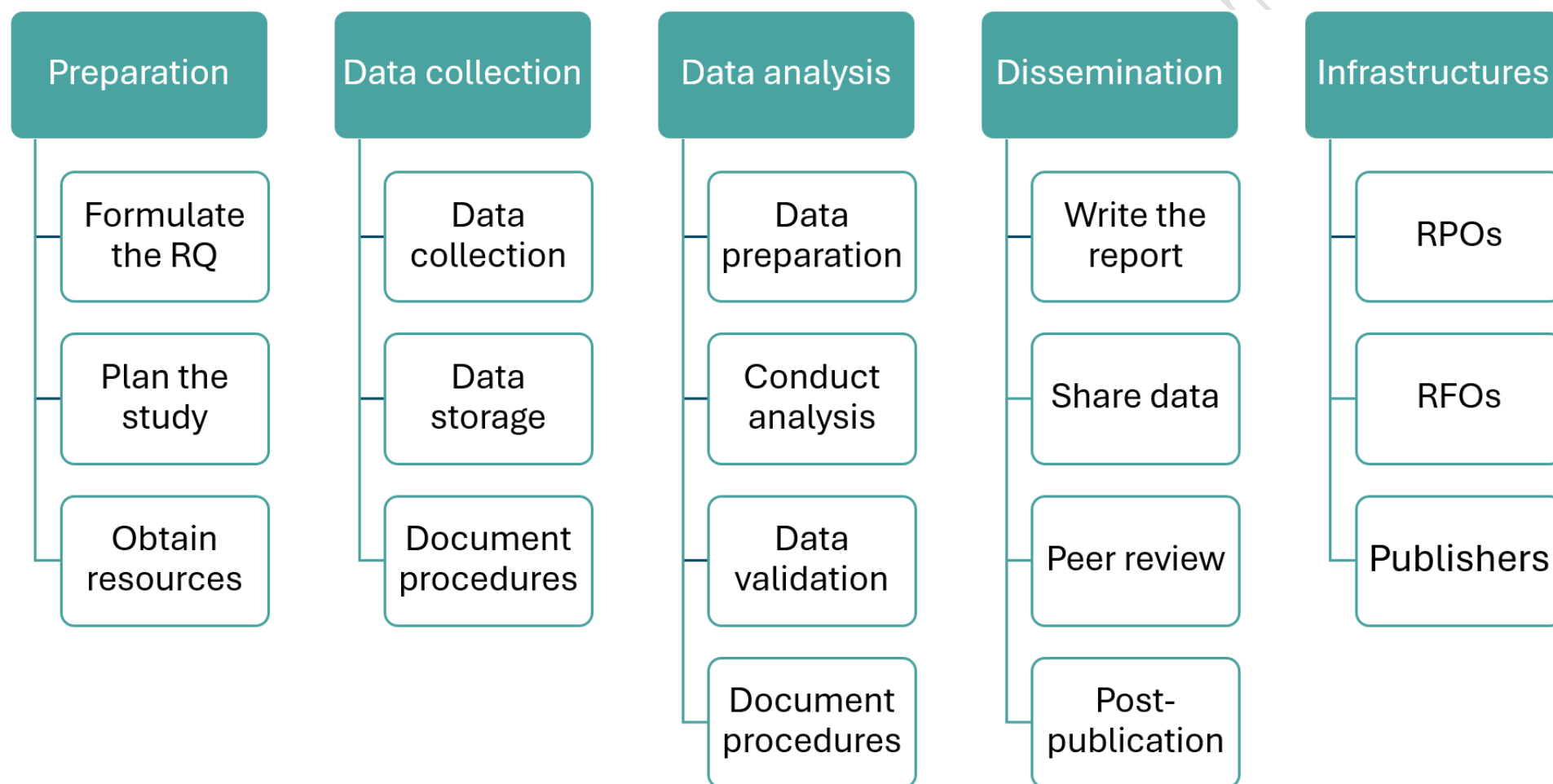


Framework of factors affecting applicability of reproducibility interventions (Fanelli 2026)

About this activity

This activity will help you develop a shared understanding of the reproducibility interventions currently in place at your institution. Together, you will identify and map existing practices, including policies, training, support services, infrastructure, incentives, and other initiatives that support reproducibility. The structured process will help you assess how well these interventions address institutional needs, identify areas of strength, and recognise important gaps or opportunities for improvement.

Supplementary material: TRUSTparency toolbox



Schematic representation of the TRUSTparency toolbox. The TRUSTparency toolbox helps navigate reproducibility interventions across stages of research, types of interventions, and detailed descriptions of specific interventions.

Printout table for structuring the discussion

	Existing interventions	Are they working?	Gaps and needs
Policies and guidelines			
Training			
Support services			
Infrastructure (e.g. repositories, software)			
Incentives			
Informal practices			
...			
...			
...			
...			

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Activity 4: Stakeholder mapping for RPP development

Type of activity	Two-phased group mapping exercise
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) identify the stakeholders relevant to reproducibility promotion within their institutional context 2) describe stakeholder roles and levels of interest to promote reproducibility 3) assess the relative influence and interest of stakeholders using a structured matrix.

Purpose

This activity helps participants develop a shared, realistic picture of the human and institutional landscape in which an RPP must operate. By systematically mapping who the important and relevant stakeholders are, what roles they play, how much influence they hold, and how they relate to one another, participants move from an abstract understanding of stakeholder interest to a concrete, institution-specific map that can directly inform RPP development process and design.

Procedure

1. Place one large sheet of paper at each table. Provide marker pens in at least three colours and sticky notes.
2. [10 minutes] Begin with a short presentation on stakeholder mapping as a practical tool for moving from aspiration to strategy. Introduce the three-phase structure of the activity. Clarify the central question that the groups will work on: "Who are the stakeholders who can influence reproducibility promotion at your institution, and what is the nature of their influence?"
3. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group).
4. [15 minutes] Phase 1 - identification. Each participant writes down relevant stakeholders and stakeholder groups on individual sticky notes, one stakeholder or group per note. Prompt participants to think beyond the obvious:
 - who has formal authority over research policy at your institution?
 - who controls infrastructure, data systems, research support services etc.?
 - who shapes norms informally – through reputation, seniority, discipline, authority?
 - who is absent from current conversations but should not be?
5. [30 minutes] Phase 2 - influence and interest matrix. Ask each group to assess the relative influence and interest of the stakeholders they have identified. Provide a simple 2×2 matrix with the axes *Influence (low-high)* and *Interest (low-high)* in enabling reproducibility and developing RPP. Participants put sticky notes with stakeholder names into one of the four quadrants. Encourage participants to discuss:
 - which stakeholders have high influence on enabling reproducibility and developing RPP?

- which stakeholders are highly engaged in enabling reproducibility and which are currently peripheral?

After filling in the matrix, participants should consider steps that could be taken to turn influential but low-interest stakeholders into interested stakeholders, and what steps could be taken to empower interested stakeholders with low influence.

6. [15 minutes] Group presentations - each group presents a summary of mapping results.
7. [15 minutes] Facilitated discussion focusing on stakeholder interest and influence. Encourage groups to share ideas from the discussion on how stakeholder engagement, and to be open about expected challenges.

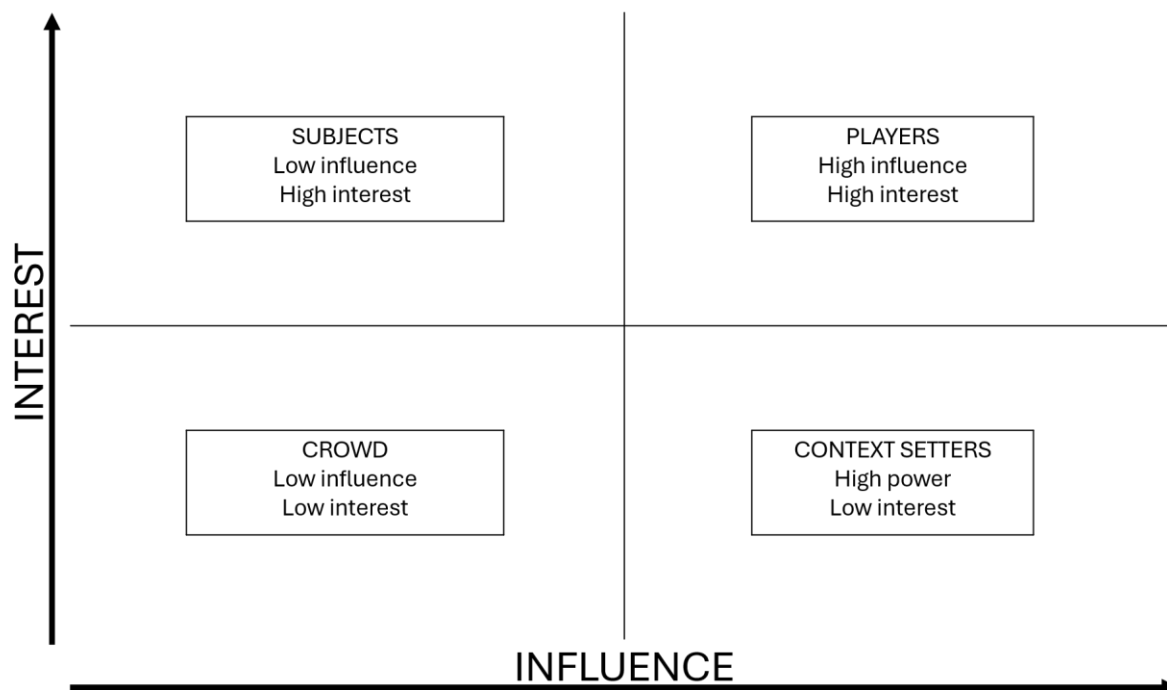
Resources and equipment

- Large sheet of paper for each group for drawing the influence-interest matrix
- Coloured markers
- Sticky notes
- Printed or digital Handout 4

Handout 4

Takeaways

- Stakeholder mapping is a three-step process: (a) identifying stakeholders, (b) analysing their roles, their influence, and interest, and (c) deciding how each should be involved. The influence–interest matrix helps identify a "coalition of change" whose authority and knowledge can help enact an RPP.
- Stakeholder mapping is iterative. Refine your mapping by consulting with core stakeholders (your "coalition of change") to find new stakeholders, linkages, and to account for changes since your initial mapping.



Influence-interest matrix, adapted from Ackermann & Eden's power-interest matrix (Ackermann & Eden, 2011)

About this activity

This activity will help you develop a shared, institution-specific understanding of the stakeholders who play a role in promoting reproducibility. Working in groups, you will identify relevant stakeholders and their roles, place them on an influence–interest matrix, and discuss how each stakeholder group can be effectively engaged. The exercise will help you explore how to involve influential but currently disengaged stakeholders, as well as how to strengthen the influence of stakeholders who are already engaged. The resulting stakeholder map will provide a practical foundation for building a coalition for change and designing the RPP co-creation process.

Supplementary material: Stakeholder descriptions

Summary of stakeholder descriptions from Pedersen & Sørensen 2026

Journals: Central institutions for communicating and validating research, with substantial influence over academic careers and a responsibility to promote reliable, transparent, and reproducible science.

Publishers: Manage key venues for communicating, validating, recognising, and evaluating research, giving them substantial influence over scientific practices.

Research funding organisations (RFOs): Shape research practices through funding decisions, standards, and evaluation criteria, placing them in a strong position to make reproducibility an integral and rewarded part of research.

Research performing organisations (RPOs): Universities, research institutes and related research units conduct and support research, employ and train researchers, and provide the institutional environment in which research takes place. They can promote reproducibility through policies, infrastructure, tools, training, incentives, and oversight.

Policymakers: Set the broader science-policy and funding frameworks within which research operates, including priorities, performance indicators, expectations, and incentives that shape the behaviour of funders, institutions, and other stakeholders.

Research integrity officers: Promote responsible and rigorous research, monitor adherence to professional standards, and provide education and training to help researchers apply good research and reproducibility practices.

Scholarly societies (e.g. academies of science): Represent disciplinary communities, organise conferences and professional activities, and shape recognition within their fields.

Reproducibility networks: collaborative networks (often national or regional) that bring together researchers, universities, funders, publishers, learned societies, and other organisations interested in improving research reproducibility.

Infrastructure providers: Supply hardware and software for performing research. Provide repositories, data platforms, scientific gateways, and other services for storing, curating, managing, analysing, sharing, and discovering research data.

Activity 5: Resources for reproducibility

Type of activity	Scenario-based group exercise with resource analysis
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) analyse how funding, time, and infrastructure constraints affect deployment of reproducibility interventions 2) identify inequalities in access to resources 3) assess which reproducibility interventions are feasible with existing resources, 4) formulate realistic priorities and starting points for an RPP.

Purpose

This activity helps participants develop a realistic, shared understanding of how access to resources decides which reproducibility interventions are feasible in their institutional context. By working through concrete scenarios, under explicit resource constraints, participants learn to distinguish between aspirational and actionable measures and identify priority investment and coordination gaps for RPP development.

Procedure

1. Prepare materials for group work: handouts, large sheets of paper and coloured markers.
2. [15 minutes] Begin with a short presentation for revisiting the role of resources in enabling reproducibility, linking explicitly to Unit 5 and to the risk of RPPs becoming aspirational if resource constraints are ignored. Introduce Nosek's culture change pyramid and the core task: participants will be asked to map institutional scenarios along the culture change pyramid, and to design plausible reproducibility priorities under those conditions.
3. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group). Assign each group a resource scenario reflecting institutional variation. Each group is asked to treat their scenario as fixed for the exercise.
4. [15 minutes] Placing institutional scenarios within the culture change pyramid across five levels (infrastructure, ease of use, norms, incentives, policy), colour-coding scenarios. For each level, the group decides which colour best reflects the scenario: green where interventions are in place and used, yellow where interventions are in place, but issues persist, orange where an intervention is absent, but interest exists, and red where interventions are absent and interest is lacking.
5. [25 minutes] Group discussion on scenarios. Using the pyramid as a reference point, each group selects two priority interventions that address a real reproducibility need and can realistically be supported with existing or slightly adapted resources. Groups also identify one critical resource gap that would need to be addressed in a longer-term RPP.
6. [15 minutes] Groups briefly report their scenario, key resource constraints, and chosen priority interventions.
7. [15 minutes] Facilitated discussion focusing on where resource inequalities most strongly shape feasibility and what this implies for RPP.

Resources and equipment

- Sheet of paper for each group with printed culture change pyramid
- Coloured markers (green, yellow, orange and red)
- Printed or digital Handout 5 and scenarios

Handout 5

Takeaways

- Reproducibility interventions require various resources – funds, time, and infrastructure. Access to resources differs across research fields and between well- and poorly resourced institutions, and within institutions, where early-career and precarious (i.e. employed with short-term contracts) researchers, and those with caring responsibilities, often face the tightest constraints.
- Failing to account for differences in access to resources may overestimate applicability of reproducibility interventions. Realistic planning also means accounting for the support roles (IT, data stewards, libraries) that make existing infrastructure usable, not just whether infrastructure formally exists.

Funds



- Costs of interventions
- Availability of grants

Time



- Time taken to implement interventions
- Less time available for e.g. researchers with care responsibilities

Infrastructure



- Materials and facilities required for interventions
- Access to data, storage and computing resources

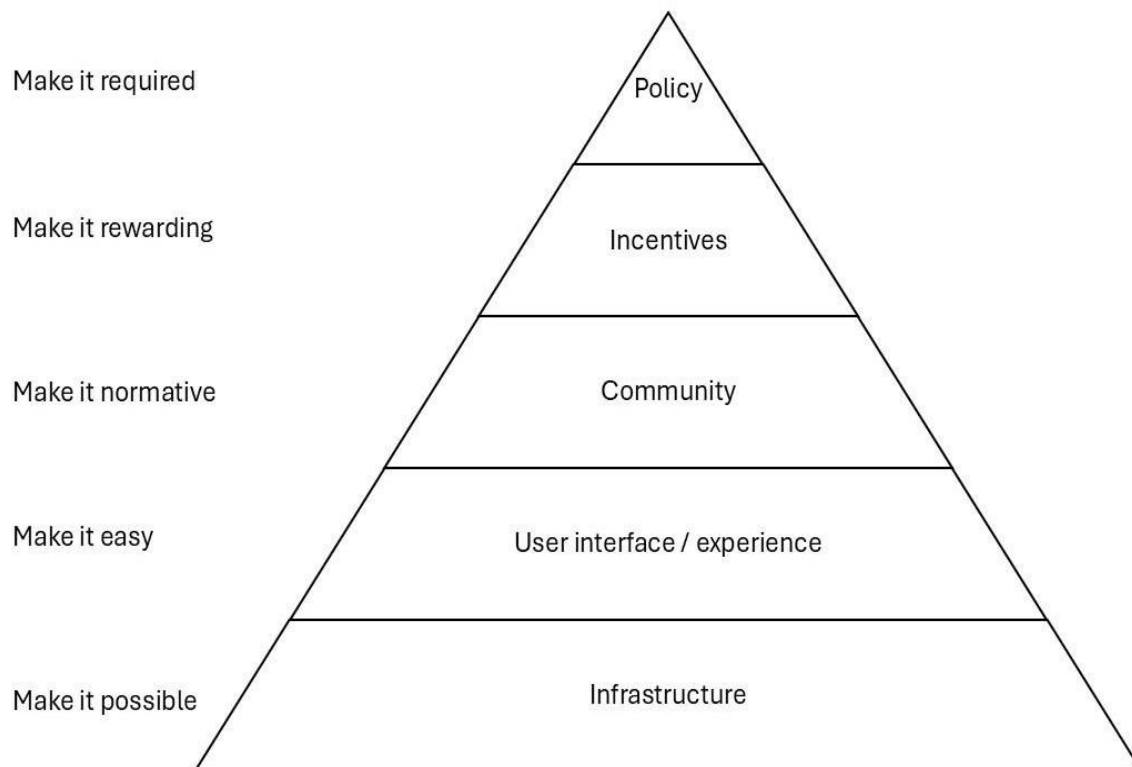
Differences across fields, institutions & demographic factors affect availability of all resources

Summary of how funds, time and available infrastructure affect the viability of reproducibility interventions (based on Fanelli 2026).

About this activity

During this activity, you will explore and discuss hypothetical institutional scenarios with different levels of resources available to support reproducibility using the five levels of Nosek's culture change pyramid: infrastructure, ease of use, norms, incentives, and policy. For each level, your group will decide which colour best reflects the scenario: **green** where interventions are in place and actively used, **yellow** where interventions are in place but challenges remain, **orange** where interventions are absent but there is interest in introducing them, and **red** where interventions are absent and there is little appetite for change. The activity will help you reflect on how available resources may shape the development and implementation of an institutional RPP.

Supplementary material: culture change pyramid



Culture change pyramid, based on Nosek 2019

* "Make it normative" here means - make the practice socially expected and part of standard professional behaviour.

Scenarios

Scenario 1

Your institution is a large, research-intensive university with stable core funding, advanced digital infrastructure, and a well-staffed research support office. Data management plan requirements, open-access mandates, and other policies are already in place. Reproducibility tools exist and are technically accessible to all researchers. The problem is not availability - it is adoption. Researchers at every career stage report that time is their most binding constraint. Publication pressure is intense, grant cycles reward speed and volume, and administrative demands have grown significantly over the past decade. Early-career researchers on fixed-term contracts feel they cannot afford to invest time in documentation or code annotation that will not directly advance their publication record. Senior researchers, stretched across supervision, leadership, teaching and grant writing, delegate reproducibility tasks informally to junior staff who are themselves under pressure. Training sessions are well-designed, but attendance is low. The institution has the infrastructure for reproducibility but has not yet created the conditions that would make using it feel worthwhile.

Scenario 2

Your institution spans a wide range of disciplines, from well-funded experimental sciences to chronically under-resourced humanities and social science departments. Reproducibility policy has been developed centrally and applies institution wide, but it was designed primarily with data-intensive quantitative research in mind. In well-funded departments, researchers have access to grant funded infrastructure and dedicated data stewards. In under-resourced departments, researchers work primarily on individual laptops, lack technical support, and use methods for which the available reproducibility tools are poorly suited or entirely inapplicable. These researchers do not feel that current reproducibility initiatives address their work; some feel actively penalised by policies that assume a research process their disciplines do not follow. Meanwhile, funding inequalities compound the problem: some researchers work in well-resourced project teams while others balance heavy teaching loads with minimal research time.

Scenario 3

Your institution relies heavily on researchers on short-term contracts (doctoral candidates, postdoctoral researchers, project staff) who carry out most of the empirical research. These researchers are often knowledgeable and enthusiastic about reproducibility practices but face structural constraints that severely limit their ability to implement them. They have limited control over project design, data infrastructure decisions, and publication strategy, which are typically determined by senior researchers. They face intense pressure to produce outputs quickly to secure future employment, and making investment in documentation, code sharing, or pre-registration feels personally risky. Training is available but optional due to time constraints. Supervisor attitudes toward reproducibility vary enormously and are the single strongest predictor of whether teams engage with reproducibility practices at all. When a researcher leaves the institution, institutional knowledge of data and methods often leaves with them - a reproducibility risk that the institution has not yet found a systematic way to address.

Scenario 4

Your institution is a mid-sized university in a middle-income country that is actively building its research capacity. Funding is limited, infrastructure is uneven, and the majority of researchers combine significant teaching loads with research activity. There is institutional commitment to open science and reproducibility at leadership level, and several policies have been adopted - partly in response to pressure from international funders and publishing requirements. However, the gap between policy and practice is wide. Many researchers are unfamiliar with tools that are taken for granted in better resourced contexts. International reproducibility standards and platforms have been developed with well-resourced institutions in mind and do not map cleanly onto local research workflows, funding structures, or publishing norms. Researchers feel the pressure to meet international reproducibility expectations but lack the resources to do so - and sometimes perceive these expectations as a form of inequality rather than a shared standard.

Activity 6: Receptivity of reproducibility interventions

Type of activity	Competence mapping and reflective discussion
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) use ResearchComp as a shared reference to discuss competences relevant to reproducibility, 2) select reproducibility interventions that align with existing levels of receptivity.

Purpose

This activity enables participants to assess how receptive their research context is to reproducibility interventions by examining competencies. Using the [ResearchComp](#) framework, participants identify competence distributions that influence the uptake and sustainability of reproducibility interventions, generating inputs for RPP design.

Procedure

1. Prepare materials for group work: handouts, large sheets of paper, coloured markers and sticky notes.
2. [15 minutes] Begin with a short presentation discussing factors affecting receptivity toward reproducibility interventions, why reproducibility depends on knowledge, competencies and institutional culture. Introduce *ResearchComp* as a shared language for transversal researcher competences, developed by the European Commission. Emphasise that *ResearchComp* is aspirational, not prescriptive, that skills vary across individuals, roles, and disciplines, and that no one researcher can be expected to excel in all competences.
3. [5 minutes] Divide participants into small groups (ideally 4–6 participants per group).
4. [15 minutes] In groups, using the *ResearchComp* framework as a shared reference, select up to five competence areas most critical for reproducibility. For each, note why it matters for reproducibility in the first two columns of the handout table.
5. [15 minutes] For each selected competence, discuss how it is currently represented in your research setting and record this under "existing capabilities" - where is it strong and widespread, where does it exist only in silos (e.g. specific labs, roles, or IT-savvy specialists), and how does this vary by discipline or career stage?
6. [15 minutes] For each competence, identify what is missing and record this under "missing competences." Discuss how these gaps might affect receptivity to reproducibility interventions, and what this implies for designing the RPP.
7. [10 minutes] Groups briefly report on their findings.
8. [15 minutes] Facilitated discussion focusing on aligning reproducibility intervention with existing competences and necessary competences building as part of RPP.

Resources and equipment

- Large sheet of paper for each group
- Coloured markers
- Printed or digital Handout 6
- Access to ResearchComp framework

Handout 6

Takeaways

- Receptivity toward reproducibility interventions is shaped by available knowledge, skills and competencies and the cultural disposition and regulations of a research context. Gaps in competencies are often field-specific.
- Reproducibility training can increase receptivity. Existing work indicates that training should be tailored to disciplinary and methodological needs to be most effective.

Knowledge



- Interventions require data management & analysis skills
- Gaps are often field-specific

Incentives



- Rapid publication is rewarded in highly competitive fields
- Novelty tends to be rewarded more than reproducibility practices

Regulations



- Regulations set compliance requirements that affect reproducibility practices e.g., data sharing
- Ethical requirements, policies and regulations vary across fields, countries and institutions

Differences across fields, institutions & countries affect receptivity, beyond the availability of resources

Summary of how knowledge, incentives and regulations affect the viability of reproducibility interventions (based on Fanelli 2026).

About this activity

During this activity, you will use the European Commission's [ResearchComp](#) framework as a shared reference to identify up to five competence areas that are most important for supporting reproducible research in your context. For each competence area, you will discuss why it matters for reproducibility, assess the extent to which it is currently present within your institution or research community, and identify any important gaps. You will then reflect on how these strengths and gaps may influence the receptivity of researchers and other stakeholders to reproducibility interventions and you will consider how this understanding should inform the design and priorities of your RPP.

Supplementary material

Note key competences for reproducibility from the ResearchComp framework in the table below. Discuss and note their impact on reproducibility, existing capabilities in your research competence, as well as missing capabilities in this competence area.

Competence area	Effect on reproducibility	Existing capabilities	Missing capabilities

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Activity 7: Relevance of reproducibility interventions

Type of activity	Case-based analysis
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) explain how the stability of research phenomena, homogeneity of methods, and philosophical compatibility affect the relevance of reproducibility interventions 2) apply the concept of contextual relevance to evaluate which reproducibility interventions are most suitable for a particular research context 3) generate insights about barriers and enablers that can inform the development of context-relevant RPPs.

Purpose

This activity enables participants to assess how relevant reproducibility interventions are in their research context, by examining the stability of research phenomena, the diversity of methods, and the philosophical compatibility of their research field and epistemic tradition. Using discipline-specific case scenarios, participants analyse the contextual factors that determine the applicability of interventions such as preregistration, data sharing, and data reuse, generating concrete inputs for the development of context-sensitive RPPs.

Procedure

1. Arrange tables in groups, place Case Cards and analysis framework sheets on the table.
2. [15 minutes] Begin with a short presentation introducing how different aspects may affect the relevance of reproducibility interventions along three analytical dimensions (research phenomena, methods, and philosophical compatibility) and explain the case-based activity format.
3. [5 minutes] Form groups of 4–6, ideally mixing disciplines and career stages.
4. [40 minutes] Groups analyse their case through the three dimensions and identify the most relevant reproducibility interventions for a particular context from the TRUSTparenCcy toolbox (see Activity 3).
5. [20 minutes] Each group presents a short summary, and facilitator leads cross-case comparison, highlighting the three analytical dimensions of each case.
6. [15 minutes] Plenary discussion on the implications of the relevance of interventions for planning the RPP. Discuss how relevant these concerns are in their research context or institutional setting.

Resources and equipment

- Printed case cards
- Printed or digital Handout 7

Handout 7

Takeaways

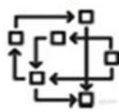
- The relevance of reproducibility interventions for a research context depends on how methods, data and tools enable different forms of research reproduction. Reproducibility interventions may be more applicable in contexts where research phenomena are stable or methods are highly codified.
- In interpretivist, constructivist, and some qualitative research traditions, findings are treated as situated and meaning-dependent, and reproducibility may have limited relevance as a standard. In some research traditions, reproducibility may be contested or limited, which can affect stakeholder engagement and create uneven adoption across fields.

Stability



- Some research phenomena are inherently more prone to change
- Data reuse is less valuable where phenomena change rapidly

Homogeneity



- Fields vary in how far methods are codified and standards shared
- Standards of evidence and methodological consistency differ across and within fields

Compatibility



- In some traditions, research findings are treated as situated and context-bound
- This can create uneven adoption and stakeholder engagement across fields

Differences in research phenomena, methods and epistemologies affect the relevance of interventions across and within fields

Summary of how stability of research phenomena, homogeneity of methods and philosophical compatibility affect the viability of reproducibility interventions (based on Fanelli 2026).

About this activity

During this activity, you will examine discipline-specific case studies and analyse the relevance of reproducibility interventions through three key dimensions: the stability of research phenomena, the homogeneity of research methods, and the philosophical compatibility of reproducibility with the research context. You will identify which interventions are likely to be most relevant in the assigned case and discuss the factors that support or limit their applicability. Drawing on these insights, you will then consider how differences in research practices, methods, and assumptions should inform the design of a context-sensitive RPP.

Case cards

Case Card 1: Cognitive psychology

Dimension highlight: *high phenomena stability, high methodological homogeneity, high philosophical compatibility*

A research team studies how people perceive optical illusions (e.g., Müller-Lyer-type stimuli) across different age groups. They use standardised stimuli, calibrated equipment, and validated response-time measures. Their protocol has been published and is widely cited in the field. Data collected 15 years ago using the same stimuli are routinely reused in meta-analyses. The field has strong agreement on what constitutes valid evidence, and reproducibility is treated as a core quality standard.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 2: Mathematics

Dimension highlight: *maximally stable phenomena, high methodological homogeneity, complex philosophical compatibility*

A mathematician publishes a proof of a long-standing conjecture. The proof is 500 pages long and relies on highly specialised techniques that only a handful of researchers worldwide can fully evaluate. Several attempts to verify the proof produce conflicting assessments – one reviewer finds a gap in a key lemma, while others consider it valid. A formal verification project attempts to check the proof using automated theorem-proving software, but the translation of informal mathematical reasoning into machine-verifiable steps reveals ambiguities not visible in the original. The field values rigour absolutely, but the notion of reproducibility is complicated: mathematical truth is considered independent of empirical observation, yet the social process of verification turns out to be surprisingly fallible.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 3: Political psychology

Dimension highlight: *low phenomena stability, moderate methodological homogeneity, moderate philosophical compatibility*

A researcher investigates the psychological factors driving voter turnout in a national election. Surveys and behavioural experiments are conducted in the weeks around election day. When the study is replicated four years later in a different political climate, the results differ substantially. The researcher argues this is theoretically expected — the phenomena themselves have changed — not a failure of the research. The field uses relatively standardised methods but acknowledges that findings are context-bound in ways that complicate direct replication.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 4: Experimental Physics

Dimension highlight: *stable phenomena, high methodological homogeneity, strong philosophical compatibility - but extreme infrastructure dependency*

A team of physicists reports a signal consistent with a previously undetected particle, based on data from a major particle accelerator. The result clears the field's conventional threshold for a discovery claim. Independent replication, however, requires access to comparable accelerator infrastructure — which exists in only a small number of facilities globally. A second team at a different facility attempts replication and finds no signal. Debate ensues about whether differences in detector sensitivity, data processing pipelines, and statistical thresholds explain the discrepancy. The field is strongly committed to reproducibility in principle, but the practical barriers to independent replication are very high.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 5: Social anthropology

Dimension highlight: *unstable/situated phenomena, no standardised methods, low philosophical compatibility*

A social anthropologist conducts an autoethnographic study of grief rituals in a community she is part of. Her findings are grounded in her unique position as both researcher and community member. She argues that another researcher entering the same community would produce a different but equally valid account – and that the value of her research lies precisely in its irreducible subjectivity. She views conventional reproducibility standards as epistemologically incompatible with her approach and is unlikely to adopt preregistration or data sharing as currently conceived.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 6: Digital humanities

Dimension highlight: *stable data/unstable interpretation, mixed methods, contested philosophical compatibility*

A research group applies natural language processing tools to a large corpus of 19th-century newspapers to study how political language evolved over time. Their work draws on computational methods from computer science and interpretive frameworks from literary studies. The same corpus can be reanalysed with different tools or theoretical lenses, producing different but complementary findings. The group is divided on which reproducibility standards apply - those from computer science, from literary studies, or a hybrid specific to digital humanities.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 7: Molecular biology

Dimension highlight: *apparently stable phenomena, high methodological homogeneity, high philosophical compatibility - but hidden sources of variability*

A molecular biology lab attempts to replicate a high-profile finding from another lab using the published protocol. Despite following it carefully, they cannot reproduce the result. Investigation reveals that subtle differences in reagent batches, incubation temperatures, and technician technique – none of which were reported in the original paper – are likely responsible. The original authors maintain that their finding is valid. The case raises questions about whether methodological codification alone is sufficient to ensure reproducibility, even in fields where it is highly valued.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 8: Astronomy

Dimension highlight: *stable phenomena but unrepeatable observations, high methodological homogeneity, strong philosophical compatibility*

An astronomy team publishes findings based on observations of a rare planetary transit - an event that will not recur for 117 years. Their data, collected over a six-hour window, cannot be independently replicated in any conventional sense. However, they make their raw observational data publicly available, and several independent teams reanalyse it using different processing pipelines and statistical models, reaching broadly consistent conclusions. A third team, applying a newer analytical technique, finds a small but significant discrepancy and publishes a reanalysis. The original authors welcome the reanalysis as part of normal scientific progress.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 9: Medicine

Dimension highlight: *moderately stable phenomena, highly regulated methods, strong philosophical compatibility - but significant contextual variability*

A clinical trial reports that a new drug significantly reduces symptoms of a common chronic condition in a sample of 800 patients. The trial is pre-registered, blinded, and follows established reporting standards. A replication trial conducted in a different country five years later, using an otherwise identical protocol, finds a much smaller effect. Subsequent analysis suggests that differences in the patient population, standard of care in the control group, and co-medication rates between the two contexts account for much of the discrepancy. The finding is not wrong – but it is not straightforwardly generalisable. The case raises questions about what reproducibility means in clinical research, where human populations are inherently variable and contextual.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Case Card 10: Philosophy

Dimension highlight: *no empirical phenomena, no experimental methods, fundamental philosophical incompatibility with conventional reproducibility*

A philosopher publishes an analysis of the concept of moral responsibility, arguing that a widely accepted premise in the field rests on an unexamined assumption. The argument is developed through close reading of existing literature and construction of thought experiments, and logical inference. There is no data to share and no experiment to replicate. Several philosophers publish responses – some accepting the argument, others offering counterexamples that they claim defeat it. The original author replies. The field's quality standards centre on logical rigour and argumentative clarity – not reproducibility in any empirical sense. Yet the process of peer scrutiny, counterexample, and revision serves an analogous function to replication in empirical fields.

Questions for discussion:

1. How do the stability of the research phenomena, the degree of methodological homogeneity, and the philosophical assumptions in this case influence the relevance of different reproducibility interventions?
2. Which reproducibility interventions are likely to be most relevant and beneficial in this research context, and why?

Activity 8: Summary

Type of activity	Synthesis and prioritisation
Duration	90 minutes
Learning outcomes	By the end of this activity, participants will be able to: 1) Synthesise insights from previous units and activities; 2) Identify priority themes to carry into the RPP preparation process.

Purpose

This activity invites participants to synthesise the insights generated across the previous activities. Drawing on the outputs of earlier discussions, participants identify the issues that are most important for promoting reproducibility in their research context and work together to agree on a set of shared priority themes to guide the RPP development process.

These priority themes are intended to inform the development of the RPP at a strategic level, without prescribing specific interventions, actions, or responsibilities, which are addressed elsewhere in the TRUSTparenacy toolbox.

Procedure

1. Assemble outputs from previous activities (Rich Picture, intervention mapping, stakeholder matrices, culture change pyramids).
2. [15 minutes] Begin with a short presentation linking to Unit 8. Introduce the preparation step of the RPP process (mandate, diagnosis, assessing readiness, identifying the right people) and how the outputs of previous activities feed into it. Introduce the task - participants will produce a synthesis of the training results and select priority themes for the RPP process.
3. [10 minutes] Individual reflection. Each participant reviews the displayed outputs and reflects on the question: "Which insights from this training matter most for reproducibility in our context?" Each participant notes one or two points on sticky notes.
4. [10 minutes] Pairs. Participants discuss their points with a neighbour. Each pair agrees on one or two points to carry forward, prioritising shared insights. Points that are similar can be merged and reformulated.
5. [15 minutes] Groups of four. Pairs join into groups of four and again agree on one or two points. Encourage groups to formulate their themes as statements about their specific institutional context. Vague or general points should be sharpened or dropped.
6. [15 minutes] Plenary compilation. If the group is smaller, this can be integrated with the previous step, allowing more time for discussion. Each group of four presents its points, which the facilitator records on a flipchart. Cluster-related points with the group's consent, but do not discard minority points. Pairs whose set-aside points did not survive may briefly raise them here if they feel something important was lost.
7. [10 minutes] Prioritisation. Give each participant five voting stickers. Participants may place several votes on one item. The most-voted items become the group's priority themes.
8. [15 minutes] Facilitated discussion on priorities. Discuss to what extent the identified priority themes reflect the state of reproducibility in your research institution. Discuss how the identified themes can help in preparation for the RPP process. Close by

pointing to the How-to guide, Primer and RPP template as the materials that carry this preparatory work into drafting the RPP.

Resources and equipment

- Outputs from previous activities
- Sticky notes and markers for themes
- Flipchart for plenary compilation
- Stickers for voting
- Printed or digital Handout 8

Handout 8

Summary

- A mandate from senior management, clarifying the scope and decision-making authority of the process, is required to create an effective RPP, and should be secured before drafting begins.
- This training provides a shared understanding of reproducibility, its barriers and drivers, and the factors shaping the viability of interventions, together with concrete outputs that support the preparatory phase of RPP development.
- Further work should draw on the TRUSTparenacy toolbox and the RPP How-to guide, Primer, and Template. Consult other resources that provide tools, training or guidance on specific aspects of reproducibility as relevant for your research context.



TRUSTparenacy's design and implementation model for Reproducibility Promotion Plans (Pedersen & Sørensen 2026).

About this activity

During this activity, you will draw on the outputs of previous activities to identify the insights that matter most for promoting reproducibility in your research context. You will begin by reflecting individually, then discuss your ideas in progressively larger groups, working towards a shared set of themes. The group will then use a simple voting exercise to prioritise these themes and agree on key priorities that can help inform the RPP development process.



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