

How to ensure your research is

transparent, reliable & reproducible?

- 1 Plan Ahead
- 2 Record everything
- 3 Share openly
- 4 Review critically
- 5 Replicate frequently
- 6 Adapt flexibly



Plan Ahead

Before beginning your research, develop a detailed plan that outlines your objectives, rationale, and methods. This helps prevent confusion, inconsistency, and deviations from your goals.

Consider potential challenges, risks, and limitations, such as ethical approval, funding, data security, or uncertainty.

Document your plan in a research protocol or proposal, detailing your research question, hypothesis, methodology, analysis, and anticipated results.

Record everything

As you carry out your research, it's essential to maintain a thorough and precise record of your actions, decisions, and outcomes. This will enable you to monitor your progress, justify your decisions, and spot any errors or inconsistencies.

Additionally, it's important to document any changes or deviations from your initial plan, along with the reasons behind them.

A practical approach is to use a lab notebook, diary, or software tool to capture and organize your data, code, notes, and references.

Regularly backing up your records and storing them securely is also crucial.

Share Openly

After completing your research, it's important to share your findings with both your peers and the public in a clear and accessible manner. This allows you to disseminate knowledge, receive valuable feedback, and showcase the impact of your work.

Additionally, you should make your data, code, and materials available to others, enabling them to reproduce or reuse your research.

A recommended approach is to publish your work in a reputable journal or platform that adheres to the FAIR principles (Findable, Accessible, Interoperable, and Reusable) and supports open access, open data, and open science initiatives.

Review Critically

After sharing your research, it's essential to critically evaluate it and reflect on both its strengths and weaknesses. This process will help you enhance your skills, learn from any mistakes, and pinpoint areas for further exploration.

Additionally, reviewing the work of other researchers in your field and comparing it to your own can keep you informed of new developments, offer fresh perspectives, and open doors for collaboration.

Using a checklist or framework that assesses transparency, reliability, and reproducibility is an effective way to review your research systematically.

Replicate frequently

As a final step, you should replicate your research or assist others in doing so. This involves repeating your study or conducting a similar one to verify or challenge your results.

Replication helps to assess the validity, robustness, and generalizability of your findings, thereby enhancing the confidence and credibility of your work.

It's also important to encourage and recognize the replication efforts of others, and to report any discrepancies or inconsistencies that arise.

A good approach to replication is using a pre-registered design, standardized protocol, or a replication package that simplifies the replication process.

Adapt Flexibility

Although these steps can aid in ensuring that your research is transparent, reliable, and reproducible, it's important to acknowledge that research is a dynamic and intricate process. It may necessitate varying approaches and solutions based on your specific context, discipline, and objectives.

Consequently, you should remain flexible and adaptable to the evolving needs and expectations of your research environment and stakeholders. Additionally, being open to new ideas, methods, and tools can further enhance the quality and impact of your research.

