Open Research Glossary

Most of these definitions are taken or adapted from the FORRT Glossary (Framework for Open and Reproducible Research Training). Wherever relevant, links to further University of Bristol guidance or relevant policies are included. There is a separate Open Access Publishing Glossary.

Open Research is an area rich in terminology. Some of the essential terms researchers should be aware of are listed below.

The University's Open Research Policy and its Sub-Policies make use of these defined terms.

Citizen science

Citizen science refers to projects that actively involve the general public in the scientific endeavour, with the goal of democratising science. Citizen scientists can be involved in all stages of research, acting as collaborators, contributors or project leaders.

Co-production

An approach to research where stakeholders who are not traditionally involved in the research process are empowered to collaborate, either at the start of the project or throughout the research lifecycle. For example, co-produced health research may involve health professionals and patients, while co-produced education research may involve teaching staff and pupils/students. This is motivated by principles such as respecting and valuing the experiences of non-researchers, addressing power dynamics, and building mutually beneficial relationships. See the University's 'Doing Co-Produced Research' Sub-Policy.

CRediT

The Contributor Roles Taxonomy (CRediT; https://casrai.org/credit/) is a high-level taxonomy used to indicate the roles typically adopted by contributors to scientific scholarly output. There are currently 14 roles that describe each contributor's specific contribution to the scholarly output.

They can be assigned multiple times to different authors and one author can also be assigned multiple roles. CRediT includes the following roles: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Data management plan (DMP)

A structured document that describes the process of data acquisition, analysis, management and storage during a research project. It also describes data ownership and how the data will be preserved and shared during and upon completion of a project. Data management templates also provide guidance on how to make research data FAIR (Findable, Accessible, Interoperable and Reusable) and where possible, openly available.

Digital Object Identifier (DOI)

A persistent identifier represented as an alpha-numeric string that can be assigned to any entity, including publications (including preprints), materials, datasets, and feature films - the use of DOIs is not restricted to just scholarly or academic material. DOIs “provides a system for persistent and actionable identification and interoperable exchange of managed information on digital networks.” (DOI Handbook). There are many different DOI registration agencies that operate DOIs, but the two that researchers would most likely encounter are Crossref and Datacite. See the University's detailed webpage on Persistent Identifiers (PIDs).

Export controls

Export controls can apply to the digital or physical export of any goods, data, technology, documents, materials or software from a destination within the UK to a destination outside the UK. Export controls are needed for a variety of reasons, including national security and international treaty obligations. The University's Research Compliance team provides detailed guidance around Export Control.

FAIR principles

Describes making scholarly materials Findable, Accessible, Interoperable and Reusable (FAIR). ‘Findable’ and ‘Accessible’ are concerned with where materials are stored (e.g. in data repositories), while ‘Interoperable’ and ‘Reusable’ focus on the importance of data formats and how such formats might change in the future.

Inclusion (or inclusivity)

Refers to a sense of welcome and respect within a given collaborative project or environment (such as academia) where diversity simply indicates a wide range of backgrounds, perspectives, and experiences, efforts to increase inclusion go further to promote engagement and equal valuation among diverse individuals, who might otherwise be marginalized. Increasing inclusivity often involves minimising the impact of, or even removing, systemic barriers to accessibility and engagement.

Metadata

Structured data that describes and synthesises other data. Metadata can help find, organize, and understand data. Examples of metadata include creator, title, contributors, keywords, tags, as well as any kind of information necessary to verify and understand the results and conclusions of a study such as codebook on data labels, descriptions, the sample and data collection process.

Open access

“Free availability of scholarship on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these research articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself” (Boai, 2002). See the University's Open Access Sub-Policy.

Open access publishing models

Different methods of achieving open access (OA) are often referred to by colour, including Green Open Access (when the work is openly accessible from a public repository), Gold Open Access (when the work is immediately openly accessible upon publication via a journal website, normally with payment of an article processing fee (APC)), and Platinum (or Diamond) Open Access (a subset of Gold OA in which all works in the journal are immediately accessible after publication from the journal website without the authors needing to pay an APC).

Open code

Making computer code (e.g., programming, analysis code, stimuli generation) freely and publicly available in order to make research methodology and analysis transparent and allow for reproducibility and collaboration. Code can be made available via open code websites, such as GitHub, the Open Science Framework, and Codeshare (to name a few), enabling others to evaluate and correct errors and re-use and modify the code for subsequent research. See the University's Open Code Sub-Policy.

Open licences

Define how others can (re)use the licensed (copyrighted) material. Different licence types are used for open access publications, open data or open software (e.g., analysis code). In setting out the permissions and restrictions, open licenses often permit the unrestricted access, reuse and retribution of an author's original work.

- **Open access licences** include Creative Commons licences like CC BY or CC BY-NC-ND. See the University's detailed guidance on Open Access Licensing: Creative Commons.
- **Open data (datasets)** are typically licensed under Open Data Commons licences which are similar to Creative Commons licences but have been specifically written by creators and users of data. Other open licences suitable for data include the National Archives (gov.uk) Non-Commercial Government Licence and Open Government Licence for public sector information.
- **Open software licences** may be permissive (similar to Creative Commons licences) and include few restrictions (e.g., MIT, Apache, BSD 3-Clause). Certain open software licences are described as 'Copyleft' which are similar in practice to a the -SA (Share-Alike) element of Creative Commons licences, requiring that derivative works be licenced under the same terms as the original work (e.g. GNU-General Public Licences). An extensive registry of open source (software) licences is available from the Open Source Initiative.

Open peer review

A scholarly review mechanism providing disclosure of any combination of author and referee identities, as well as peer-review reports and editorial decision letters, to one another or publicly at any point during or after the peer review or publication process. It may also refer to the removal of restrictions on who can participate in peer review and the platforms for doing so. Note that 'open peer review' has been used interchangeably to refer to any, or all, of the above practices.

ORCiD

An organisation that provides a registry of persistent unique identifiers (ORCID iDs) for researchers and scholars, allowing these users to link their digital research documents and other contributions to their ORCID record. This avoids the name ambiguity problem in scholarly communication. ORCID iDs provide unique, persistent identifiers connecting researchers and their scholarly work. It is free to register for an ORCID iD at https://orcid.org/register. The University has more guidance on its webpages about registering for an ORCID and on Persistent Identifiers (PIDs)

Preprint

A publicly available version of any type of scientific manuscript/research output preceding formal publication, considered a form of Green Open Access. Preprints are usually hosted on a repository (e.g. arXiv) that facilitates dissemination by sharing research results more quickly than through traditional publication. Preprint repositories typically provide persistent identifiers (e.g. DOIs) to preprints. Preprints can be published at any point during the research cycle, but are most commonly published upon submission (i.e., before peer-review). Accepted and peer-reviewed versions of articles are also often uploaded to preprint servers to update the pre-print record. These versions are called post-prints. The University's webpages present more information about preprints.

Pre-registration

The practice of publishing the plan for a study, including research questions/hypotheses, research design, data analysis before the data has been collected or examined. It is also possible to preregister secondary data analyses (Merten & Krypotos, 2019). A preregistration document is time-stamped and typically registered with an independent party (e.g., a repository) so that it can be publicly shared with others (possibly after an embargo period). Preregistration provides a transparent documentation of what was planned at a certain time point and allows third parties to assess what changes may have occurred afterwards. The more detailed a preregistration is, the better third parties can assess these changes and with that the validity of the performed analyses. Preregistration aims to clearly distinguish confirmatory from exploratory research. See the University's Pre-Registration & Registered Reports Sub-Policy

Public and patient involvement

Active research collaboration with the population of interest, as opposed to conducting research “about” them. Researchers can incorporate the lived experience and expertise of patients and the public at all stages of the research process. For example, patients can help to develop a set of research questions, review the suitability of a study design, approve plain English summaries for grant/ethics applications and dissemination, collect and analyse data, and assist with writing up a project for publication. See the University's 'Doing Co-Produced Research' Sub-Policy.

Registered reports

An initiative launched in 2021 dedicated to receiving, reviewing, and recommending Registered Reports (RRs) across the full spectrum of science, technology, engineering, and mathematics (STEM), medicine, social sciences and humanities. Peer Community In (PCI) RRs are overseen by a 'Recommender' (equivalent to an Action Editor) and reviewed by at least two experts in the relevant field. It provides free and transparent pre- (Stage 1) and post-study (Stage 2) reviews across research fields. A network of PCI RR-friendly journals endorse the PCI RR (Registered Reports) review criteria and commit to accepting, without further peer review, RRs that receive a positive final recommendation from PCI RR. See the University's Pre-Registration & Registered Reports Sub-Policy.

Reproducibility

A minimum standard on a spectrum of activities ("reproducibility spectrum") for assessing the value or accuracy of scientific claims based on the original methods, data, and code. For instance, where the original researcher's data and computer codes are used to regenerate the results (Barba, 2018), often referred to as computational reproducibility. Reproducibility does not guarantee the quality, correctness, or validity of the published results (Peng, 2011). In some fields, this meaning is, instead, associated with the term "replicability" or 'repeatability'.

Research culture

Research culture encompasses the behaviours, values, expectations, attitudes and norms of our research communities. It influences researchers' career paths and determines the way that research is conducted and communicated. The University has a Research Culture Vision & Strategy.

Research data

The data (such as statistics, results of experiments, measurements, observations, interview recordings, images, etc.) used to validate the results presented in scientific publications or other data used during a project and described in the Data Management Plan (DMP). See the University's detailed guidance on managing research data.

Research integrity

Research integrity is defined by a set of good research practices based on fundamental principles: honesty, reliability, respect and accountability (ALLEA, 2017). Good research practices —which are based on fundamental principles of research integrity and should guide researchers in their work as well as in their engagement with the practical, ethical and intellectual challenges inherent in research— refer to areas such as:

- **research environment** (e.g., research institutions and organisations promote awareness and ensure a prevailing culture of research integrity)
- **training, supervision and mentoring** (e.g., Research institutions and organisations develop appropriate and adequate training in ethics and research integrity to ensure that all concerned are made aware of the relevant codes and regulations)
- **research procedures** (e.g., researchers report their results in a way that is compatible with the standards of the discipline and, where applicable, can be verified and reproduced)

- **safeguards** (e.g., researchers have due regard for the health, safety and welfare of the community, of collaborators and others connected with their research)
- **data practices and management** (e.g., researchers, research institutions and organisations provide transparency about how to access or make use of their data and research materials)
- **collaborative working, publication and dissemination** (e.g., authors and publishers consider negative results to be as valid as positive findings for publication and dissemination)
- **reviewing, evaluating and editing** (e.g., researchers review and evaluate submissions for publication, funding, appointment, promotion or reward in a transparent and justifiable manner).

The University provides detailed guidance on research integrity.

Research output

Outputs of research can include books, articles, exhibitions, software, patents, visual media and more. Universities UK has more detailed information about research outputs.

Responsible research

An approach that considers societal implications and expectations, relating to research and innovation, with the aim to foster inclusivity and sustainability. It accounts for the fact that scientific endeavours are not isolated from their wider effects and that research is motivated by factors beyond the pursuit of knowledge. As such, many parties are important in fostering responsible research, including funding bodies, research teams, stakeholders, activists, and members of the public.

Transparency

Having one's actions open and accessible for external evaluation. Transparency pertains to researchers being honest about theoretical, methodological, and analytical decisions made throughout the research cycle. Transparency can be usefully differentiated into "scientifically relevant transparency" and "socially relevant transparency". While the former has been the focus of early Open Science discourses, the latter is needed to provide scientific information in ways that are relevant to decision makers and members of the public (Elliott & Resnik, 2019).