Doctoral competencies framework

Research Ethics, Scientific Integrity and Open Science

SORBONNE UNIVERSITÉ

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This doctoral competencies framework in terms of research ethics, scientific integrity and open science was designed in February 2023 as part of a working group bringing together representatives of the Sorbonne University Library, the Collège doctoral and the Research Ethics Committee. It responds to the need to define a common base of skills for doctoral students at Sorbonne University, following the adoption of the decree of August 26, 2022 modifying the national training framework and the modalities leading to the delivery of the PhD[1]. This decree establishes the obligation to train doctoral students in research ethics and scientific integrity and to raise their awareness of the issues of open science and the dissemination of research work in society.

The working group was freely inspired by existing frameworks that succinctly address these skills, such as the *French Répertoire national des certifications professionnelles : RNCP31437 Doctorat – Éducation, formation*[2] or the *National PostDoctorant Association Core competencies resources*[3]. For each category, this framework includes three levels:

- Level 1 : Knowledge of the essential bases and useful contacts

- Level 2 : Finer knowledge, ability to apply and transmit the basics

- Level 3 : Ability to apply previous levels skills to varied contexts, autonomy, ability to transmit advanced elements

[1] Decree of 26 August 2022. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000046228965
[2] DOCTORAT - Education & training RNCP31437. https://www.francecompetences.fr/recherche/rncp/31437/
[3] NPA Core competencies resources, 2019. https://cdn.ymaws.com/www.nationalpostdoc.org/resource/resmgr/2019_launch/resources/corecomps/npa_core_competencies_resour.pdf

Table of contents

Take action for a culture of scientific integrity

LEVEL 1

Develop your ability to conduct research with integrity, to consider the risks of breaches and to recognize actual breaches of scientific integrity.

- Distinguish between research ethics, scientific integrity and the professionnal ethics (legally recognised in France) of civil servants ;
- Know the issues of scientific integrity in today's world and the actors who operate in the field ;
- Know the foundations of open science and their links with scientific integrity issues ;
- Understand the usefulness of good data management for research with integrity ;
- Know the basic issues specific to your discipline in terms of scientific integrity ;
- Know how to recognise a conflict of interest and declare it ;
- Identify contacts in your professional environment to seek advice on scientific integrity and report breaches, if applicable ;
- Identify the interlocutors for civil servants professionnal ethics issues (recognised by the French law)·

LEVEL 2

Gradually implement best practices and spread notions and issues of research integrity around you.

- Develop a detailed understanding of the issues specific to your discipline in terms of scientific integrity ;
- Know how to identify breaches of scientific integrity and alert the competent authorities ;
- Know how to broadly explain the issues of scientific integrity to your peers.

LEVEL 3

Autonomously implement best practices and contribute to developing a culture of research integrity and open science in scientific communities.

- Know how to construct a research project within the framework of scientific integrity obligations, particularly regarding the application of the GDPR ;
- Be able to implement a honest research approach, including documentation of the processes and methods used and reflection on a mode of organizing production to make it usable by other teams ;
- Know how to train peers or master's students in the issues of scientific integrity.

Take action for ethical research

LEVEL 1

Develop your ability to recognize ethical issues in research

● Distinguish between research ethics, scientific integrity and the professionnal ethics (legally recognised in France) of civil servants ;

● Recognise the different types of general ethical issues, including inalienable human rights, consent, animal suffering and ecological issues, even if our field of research is not concerned ;

● Recognise the basic issues specific to your discipline in terms of ethics, particularly if you work with humans or animals ;

● Know the national and international legal rules that govern research practices involving humans and animals ;

● Identify the interlocutors in his professional environment to seek advice on research ethics.

LEVEL 2

Take responsability for ethical issues in your research

● Depending on the type of study, know how to obtain consent (free, informed, specific, unequivocal) from the person or their representative, with the correct documents ;

● Consider the possible use of the study for non-scientific purposes ;

● Transmit the basic issues in terms of research ethics, at least in your discipline.

4

Take action for open access to scientific publications

LEVEL 1

Develop your knowledge about circulation choices, and more specifically regarding your paper's distribution, as to favour open mindedness, scientific common good and the restitution of the results of scientific research to the public.

● Understand the challenges of open access to scientific publications and the open access methods available to authors ;

● Develop critical thinking about the obstacles to the development of open access, in particular about research assessment ;

● Know your rights and obligations as academic authors, particularly in terms of open access ;

● Know the institutional policy of your supervisory authorities regarding open access ;

● Know the requirements of research funding bodies in terms of open access ;

● Know the legal tools for open access, in particular open licenses and the strategy of retaining rights ;

● Identify the contacts in your professional environment to request support for open publication.

LEVEL 2

Use open access tools in a regular basis, especially when the legal issues can be easily identified, and know how to talk about open access around you.

● Know how to deposit your publication in HAL or another open repository, in accordance with the law and with the consent of the co-authors, with possible support ;

● Know how to identify a publisher's open access policy and know the tools to help search for open access journals ;

● Be able to suggest to your team a virtuous open-access journal of a high scientific level, possibly in partnership with your supervisory institution ;

● Know how to broadly explain the issues of open access in scientific publications to your peers.

LEVEL 3

Use open access tools on your own, identify the difficulties related to complex cases and learn how to train people in open access issues.

● Know how to deposit an accepted manuscript in HAL or another open archive, in accordance with the law and with the consent of co-authors, independently, and help peers to use it ;

● Identify the problems posed by more complex situations, such as possible conflicts between the obligation of open access and the desire to publish in a subscription-based journal that is considered more prestigious ;

● Be able to suggest to your team alternative means of dissemination for scientific articles, recognized for its seriousness by academic institutions, in particular the supervisory establishment ;

● Know how to advise your peers on open access ;

● Know how to train your peers or master's students on the issues of open access.

Take action for transparency and the reproduction of scientific research

LEVEL 1

Develop your ability to implement open and reproducible research methods, when compatible with the status of the work carried out.

● Understand the challenges of FAIR (easy-to-find, accessible, interoperable, reusable) management of research documents, data and source codes and, where possible, of opening them up, in particular the need to improve the reproducibility and transparency of scientific research ;

● Know your rights and obligations as a person producing documents, data and source codes ;

● Know the legal tools for opening data and codes, in particular open licenses, and master the exceptions to opening (personal data for example) ;

● Know the institutional policy of your supervisory authorities regarding data management and open data ;

● Know the requirements of research funding bodies regarding data management and open data ;

● Identify the contacts in your professional environment to request support for open publication and managing research documents, data and codes.

LEVEL 2

Develop good practices in terms of reproducibility, familiarise yourself with tools, learn how to talk about them around you.

● Understand the importance of the reproducibility of data and source codes for the progress of your discipline and your field of research ;

● Prepare your data with a view to making them reproducible, with the possible support of a data management plan ;

● Know how to use the tools to open your data and source codes, in particular with certified open repositories for data and source code, and with possible support ;

● Know how to communicate differently about your work, especially via scientific blogging tools, such as social networks and Hypothèses.org research blogs, and journals publishing negative results ;

● Be able to suggest the tools mentioned above to your team ;

● Know how to broadly explain the issues of reproducibility of data and source codes (and, when possible, their openness) to your peers.

LEVEL 3

Use open access tools, identify the difficulties related to complex cases and learn how to train people in open data and open souce codes issues.

● Know how to explain the importance of the reproducibility of data and source codes for the progress of your discipline and your field of research ;

● Undertake a comprehensive and proven approach to preparing data with a view to making it reproducible, with the possible support of a data management plan ;

● Know how to use the tools to open your data and source codes independently, in particular for open repositories, and to help your peers to use them ;

● Identify the problems posed by complex situations, in particular by the different legal regimes governing the data concerned and their exceptions ;

● Know how to train peers or master's students in the topic of the reproducibility of data and source codes (and, when possible, their openness).