

Responsible Research (and Innovation) Tutorial for IPP

J Douglas Armstrong, March 2023

Overview

Firstly this is a complex and deep topic and this introduction will have to be superficial. You should explore the links and further training material, depending a bit on your project.

What is Responsible Research? Lots of definitions exist and they depend on context. Who is doing the research? – is this a personal project? is it funded by a government agency? is it a commercial research programme? – these questions all have an impact on the context, legal framework and the general aims of what you are trying to achieve. The EPSRC - UK research funding agency who support a lot of research in Informatics - have produced the following useful background document: <https://www.ukri.org/councils/epsrc/guidance-for-applicants/what-to-include-in-your-proposal/health-technologies-impact-and-translation-toolkit/research-integrity-in-healthcare-technologies/responsible-research-and-innovation/>

Fundamentally responsible research is an extension of risk management. First of all, are you as an individual being exposed to increased risk to yourself through undertaking this research? – this could be direct physical risk, or it could be reputational. Are others in your organization or your environment going to be put at risk through this research? Do you have research subjects (human or otherwise) and what are the potential impacts on them? What are the risks at societal level? A good ethical review will cover much but not all of these. It is important to reflect on the wider picture.

Location is very important: Where are you doing the research? – This can be a tricky topic, there are big differences in national legislation around research areas and there also are significant societal differences as well. You must understand the national laws that affect you in terms of what you can and cannot do. Increasingly the use of, and transfer of, advanced informatics technologies are legally regulated. There are legal advisors at the University if you or your supervisor are unsure.

You should also understand the **local society view on that type of research** and be sensitive to how it might be perceived by minorities as well as the majority. You should also consider how other cultures and national legal frameworks might view your research. Just because a piece of research is legal and acceptable in one society could risk your international career/reputation elsewhere if not handled with care.

The University of Edinburgh has a high-level policy on responsible research and innovation and provides a suite of training materials that you can select depending on the area of research and contacts for further advice if needed.

<https://www.ed.ac.uk/research-office/research-integrity/research-integrity-learning/training-support-resources>

Responsible Research and IPP and your Dissertation project:

We simply cannot cover everything in this one session but we want you to focus in on a subset as follows:

1. **Personal and Institutional Risk:** Are there any personal or institutional risks associated with performing the research. Are you or is anyone else at risk of physical or reputational harm

here or elsewhere by this research? *If applicable then these must be considered in your risk assessment.*

2. **Ethics** – we have a strict university policy on ethical review of research, much of which is covered by UK legislation. There is a separate session on research ethics and *you must include an ethics review in your IPP – even if the ethics review concludes that there are no identifiable ethical implications of your research*

3. **Dual-Usage** – This is often rolled into Ethics but it is legally distinct. Your research may be entirely benign (harmless) but you have an obligation to consider if the code/results could be used by others to cause harm. *This can be considered in your risk assessment*. If sufficient risk is identified then this might impact how you publish or perform the research and what licenses you put in place to prevent or restrict its access or application in other areas where it might be misused (see Licenses below).

4. **Attribution and, where appropriate; Licensing**. Who owns the research, who owns the data, who owns the code. In some cases it is very simple – you do. In most cases it is a bit more complex. Are you contributing to a small part of a longer term research programme or linked set of research projects? How do you acknowledge those that came before you? How do you want your contribution to be recognized by others going forward? Licenses are critical to permit others to extend/build on research code. *This should be outlined in your IPP*.

Software Licenses explained

<https://open.ed.ac.uk/software-licensing-open-source-and-sharing-your-code/>

https://media.ed.ac.uk/media/Software+Licensing%2C+Open+Source+and+Sharing+Your+Code/1_z4nt6a76/48781431

5. **Reproducibility**. One of the fundamental pillars of science and research is the ability to reproduce the results of research. As duplicating a research study can be very costly this term mostly concerns the ability to replicate the analyses. To do this the methodological and analytical tasks in your research need to be clearly documented along with a comprehensive list of data, tools and resources. The sharing of data and code is a common issue in informatics research projects.

See also Alston and Rick (2020) A Beginner's Guide to Reproducible Research

<https://esajournals.onlinelibrary.wiley.com/doi/epdf/10.1002/bes2.1801>

Most academic and commercial projects are required by their funders to have a formal data management plan in place from the start, and for that plan to be a live document that is reviewed during the project. Here will ask you to consider the essentials. Where will your data and/or code be stored during the project and as part of your risk assessment you should consider if this is safe. Secondly, what will happen to your code and data after the project. This is something you should discuss with your supervisor and outline in brief in your IPP. *This should be outlined in your workplan*.

A local option is data archiving at UofE (Edinburgh Datashare)

<https://open.ed.ac.uk/archiving-your-research-data/>

https://media.ed.ac.uk/playlist/dedicated/102732871/1_d9odwh5w/1_ch92fg6j

Increasingly funders of research are insisting that data be made available in compliance with the FAIR data principles? <https://force11.org/info/the-fair-data-principles/>

- To be Findable
- To be Accessible
- To be Interoperable
- To be Re-usable

For those interested there is a good discussion of some of these issues in https://en.wikipedia.org/wiki/Open_science

We have focussed on the common issues that arise in MSc research projects where your decisions with your supervisor will have an impact. The links provided give wider context and discussion, but we emphasise that this document is not comprehensive and we have chosen not to explore issues such as sustainable research or environmental and social impact. If these apply to your project then you are encouraged to discuss them, but we do not expect you to do so.

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Tutorial outline

1. Review the essential steps in Responsible research above. This could be packaged into a short lecture and made available or just a PDF of pages 1-3 of this document (editing out the Tutorial sections).
2. Review the Hunted! With GPS project below, again provide the project outline as a PDF (pages 5-6, removing the tutor notes although these can be shared later).
3. Identify which areas in Responsible Research are likely to apply to the example project and what the issues might be. (see tutor notes in page 7)
4. Discuss wider implications of responsible research as appropriate to the tutorial group.
5. Tutors should feel free to change the example if they prefer but this would need circulated with your group in advance. In future years if projects are public then this tutorial could also use the students own projects.