Integrating Research Integrity and Philosophy of Science in a Teaching Context

Per Sandin

1. Introduction

In general, research ethics or integrity and philosophy of science are distinct fields. As academic pursuits, they have different journals and congresses. While philosophy of science is primarily a domain for academic philosophers, research ethics is considerably more diverse regarding the disciplinary background of its practitioners, something that holds for other fields of applied ethics as well (cf. Sandin 2015). Research ethics is institutionalized in various degrees and frequently subject to oversight by IRBs and similar bodies. In a teaching context, the topics are typically done in separate courses, using separate textbooks – *e.g.* books like Johansson (2016) or Chalmers (2013) for philosophy of science and Shamoo and Resnik (2022) for research ethics. However, this does not have to be the case. In fact, there are some notable benefits with combining the subjects and teaching them in an integrated way, but also come challenges. In this paper, I will share my experiences of teaching research integrity, ethics and philosophy of science in one and the same course for PhD students at the *Swedish University of Agricultural Sciences* (SLU).

Swedish PhD programs are typically four years, and the candidates are required to write a thesis, but also to partake in a number of PhD courses, some of them in the subject area of the thesis work, and others that provide general or 'transferable' skills. Those skills are supposed to be part of the general education of an academic. At my university, the 'transferable skills' courses include academic writing, information retrieval, science communication, and several courses in statistics. They are offered to all PhD students, regardless of subject. The courses in ethics and philosophy of science belong in this category.

2. The Ethics and Philosophy of Science Courses at SLU

Since a few years back, it is a requirement for graduating that all PhD students at SLU are to take part in credit-awarding courses in ethics and philosophy of science, and it is also specified that the courses cover rules about cheating and plagiarism.[1] There is an obvious pragmatic reason for this: According to the Higher Education Act (*Högskolelagen*, 1992:1434), 'higher education institutions shall uphold academic credibility and good research practice'. And according to a more recent provision in the Higher Education Ordinance (*Högskoleförordningen*, Amendment 2019:1151), 'A higher education institution must ensure that staff can obtain advice and support on issues

[1] Decision by the Vice-Chancellor, Dnr SLU ua 2018.1.1.1-4677

relating to good research practice and deviations from such practice'.[2] Training of students and staff are obvious ways of partly meeting these requirements.

The courses were designed to be a convenient way for the PhD students to fulfil that requirement. Previously, the university offered optional, separate courses in research ethics and philosophy of science. These courses covered 3 HEC each. The topics have now been merged into one course, which is shorter and more streamlined than the previous ones, but which reaches more students. For historical reasons, the university's different campuses offer courses of 3, 4, and 4.5 HEC respectively. The contents, however, are reasonably similar, with the obvious difference of the longer courses including some more materials and covering some topics in more depth.

The general structure of the courses for which I am responsible involves covering the following topics in roughly chronological order, with some examples of typical class activities:

- *Introduction, theory of knowledge and how 20th-Century philosophy of science has problematized a naïve view of science*. Includes exercises where the participants are asked to tentatively define 'science' and present some criteria for what makes something good or bad science, respectively.
- *Historical overview of the development of science and theories of science, roughly from the scientific revolution to Kuhn*.
- *'Classic' philosophy of science – the logic of scientific discovery from inductivism to the hypothetic-deductive method, followed by sessions on scientific modelling and explanation*.
- *Science and pseudoscience – demarcation in practice*. Revisits the definition of science, but through one of its negations – pseudoscience – with an exercise where participants present a case of something that could be regarded as pseudoscience, and possible strategies for counteracting pseudoscience.
- *Science and society – the consequences of science, weaponization of scientific results, activism and whistleblowing*. Approached through a number of group discussion exercises, some based on adaptations of real-world cases.
- *The ethics of research on humans and animals, including legal requirements for ethical review*. A mix of exercises on regulatory issues and discussions about their foundations.
- *Science and gender*. Lectures, individual and group exercises, both from a philosophy of science perspective and an academic working environment perspective.

[2] Translations are from The Swedish Council for Higher Education, available at https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The-Swedish-Higher-Education-Act/

- *Good research practice, management of misconduct issues; publication and authorship*. Hands-on exercises about authorship.

The participants are assessed based on active participation (attendance is compulsory) and two shorter written assignments. There are six meetings for a 3 HEC course and eight for a 4 HEC one. Meetings are in person on campus. However, the 3-credit course has two meetings online in Zoom. If a student misses classes, the student can retake them when the courses run at a later time. There are opportunities at least once a year. The courses are taught by several teachers, in most cases with me as coordinator and mainly responsible for the ethics parts of the course. The other teachers are recruited from SLU and other universities. As far as possible, they are active researchers in the topics they teach (for instance, history or philosophy of science, science and gender, or animal research ethics). I sit in on the classes taught by other teachers. This enables me to 'connect the dots' between different themes in the course. For instance, I highlight the relationship between the demarcation discussion (what separates science from other activities) and the role of scientific expertise in society.

It is also worth noting that when we discuss philosophy of science, we understand 'science' in a broad sense, that corresponds to the German word *Wissenschaft* (or Swedish *vetenskap*), referring to a wide array of systematic knowledge seeking, including social science and humanities.

In terms of topics covered, then, the course contents are conventional, in that they are what you would expect from research ethics courses and philosophy courses. What might be less common, however, is the integration of the topics into one course.

3. Integrated Courses – The Benefits

The main benefit is what for lack of a better expression might be called 'how it all hangs together'. It is not possible to understand what science is without very rapidly touching on ethical issues. Even with a seemingly abstract demarcation criteria for science – like application of the hypothetico-deductive method, as proposed by Johansson (2016) – issues like the honesty of the scientists must be assumed when the method is actually practiced. This interdependence is also illustrated by the idea of good research practice and its opposite, scientific misconduct. A substantial part of good research practice is about the reliability of results. There are, however, numerous ways in which research results can become unreliable (or untrue). Some of them involve moral culpability. There is, of course, falsification and fabrication – typically understood as research results are being made up, or data fiddled with, either intentionally or through culpable negligence. This is a typical research ethics or research integrity issue. But the question of reliability also bears on philosophy of science. Centuries of discussions about the demarcation of science from non-science or pseudoscience (Hansson 2021) have concerned reliability.

Another issue illustrating the intermingling of research ethics and philosophy of science is the prominent place given to Robert Merton's CUDOS norms. Writing in the 1940s, Merton takes the institution of science to be characterized by imperatives or norms or that 'possess a methodologic rationale but they are binding, not *only* because they are procedurally efficient, but because they are believed right and good, (Merton 1973, p. 270, emphasis added). Merton mentions four such norms, nowadays usually referred to by the acronym CUDOS: Communism (today usually referred to as 'Communalism' to avoid unwanted political association), Universalism, Disinterestedness, and Organized Scepticism. Together, they amount to saying that science is a community with open sharing of results, that science is universally evaluated based solely on scientific criteria and not, for instance, a researcher's political background, that scientists are driven by the search for truth and not by irrelevant goals like prestige, and finally, that the scientific community is sceptical to new claims but in an organized fashion, as most obviously implemented in the form of the peer-review system. The Mertonian CUDOS norms are not uncritically promoted, but they resonate strongly with current research ethics guidelines, such as the ones from the Swedish Research Council (2017, p, 10):

> 1) You shall tell the truth about your research
> 2) You shall consciously review and report the basic premises of your studies.
> 3) You shall openly account for your methods and results
> 4) You shall openly account for your commercial interests and other associations
> 5) You shall not make unauthorised use of the research results of others.
> 6) You shall keep your research organised, for example through documentation and filing.
> 7) You shall strive to conduct your research without doing harm to people, animals or the environment.
> 8) You shall be fair in your judgement of others' research.

This is also echoed in the more general 'principles' stated in the Code of Conduct for Research Integrity adopted by the All European Academies, ALLEA: Reliability, Honesty, Respect and Accountability (ALLEA 2023, p. 5).

Merton was an empirical sociologist, but what he takes to be characteristics of an institution has since come to be understood as transformable into guidelines for individual researchers. This interaction highlights the ever-present discussion about distinctions about facts and value. In this way, participants are given an opportunity to explore this intersection.

4. The Challenges

The most obvious challenge for a course like this is the time constraint. Everyone who has taught a course in philosophy of science understands that a

two-week course will not be anywhere near even covering the very basics. Add to that the fact that most participants will not have any previous training in philosophy, with its vocabulary, methods and conceptual apparatus. And then cover research ethics too, in the same course? This is of course related to another well-known potential challenge: that courses that cover compulsory content might come to be regarded as mere 'box checking' both by participants and the university. Interestingly, on the occasions that the courses receive particular attention, it is often in reaction to some specific perceived threat. There have been at least three such events where there has been intense interest in the course contents from other faculty members: The first was the implementation of GDPR in 2018, the second was related to the attention given to the enforcement of the *The Swedish Act concerning the ethical review of research involving humans* (considerable media debates erupted in 2022), and, third and finally, the near-panic in academia prompted by the release of Chat GPT (since 2023).

Additionally, there is a practical challenge to fill all the spots with competent teachers, especially in a way that ensures a degree of continuity between terms.

Fortunately, the challenges are not unsurmountable. First, there must be a realization that a course of this kind necessarily will have to be an overview of the topics rather than anything else. This realization must be communicated to the participants. It also means that one must be prepared to guide students to further readings and resources, and in some cases to further more specialized courses, for instance theory and method courses for social scientists. Second, the courses obviously need to be adapted and updated, especially as regards changes in legislation and enforcement. Some additions have also been made in response to suggestions by students, for instance substantially increased discussion of questions about science and gender – which is of course a field that very much integrates issues of ethics and philosophy of science. Third, the best way of tackling the 'box checking' problem is to provide relevant quality content, but also to encourage (through discussion exercises) sharing of experiences and perspectives between participants. Fourth and finally, filling the spots with competent teachers requires planning well ahead, and utilizing professional networks.

5. Concluding Remarks

In general, thus, my experiences of organizing courses that combine ethics and philosophy are positive and the courses are usually appreciated by participants. From the point of view of a teacher, hearing the participants' own narratives and thoughts is also very valuable a learning experience, and reflections on those thoughts and narratives are used for continuous development of the course contents and formats. From a university perspective, it should be noted that combining research ethics and philosophy of science is feasible and worthwhile, but that it is also an endeavour that requires pooling of some rather specific competences, that might not be immediately available everywhere.

References

ALLEA. 2023. *The European Code of Conduct for Research Integrity* – Revised Edition 2023. Berlin. DOI: 10.26356/ECOC (accessed May 19th, 2024).

Chalmers, Alan F. 2013. *What is this thing called Science?* Open University Press.

Hansson, Sven Ove. 2021. Science and pseudo-science. In Edward N. Zalta (ed) *The Stanford Encyclopedia of Philosophy* (Fall 2021 Edition). URL = https://plato.stanford.edu/archives/fall2021/entries/pseudo-science/ (accessed May 28th, 2024).

Johansson, Lars-Göran. 2016. *Philosophy of Science for Scientists*. Springer.

Merton, Robert K. 1973. The normative structure of science. In *The Sociology of Science: Theoretical and Empirical Investigations*. Edited and with an introduction by Norman W. Storer. University of Chicago Press, pp. 267-278.

Sandin, Per. 2015. The profession and the killer app, or what environmental ethicists might learn from bioethics: A commentary. *Ethics, Policy & Environment*, 18(3), pp. 275–282. https://doi.org/10.1080/21550085.2015.1111613

Shamoo, Adil E. and Resnik, David B. 2022. *Responsible Conduct of Research*. 4th ed. Oxford University Press.

Swedish Research Council. 2017. *Good Research Practice*. https://www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice_VR_2017.pdf (accessed May 28th, 2024)