Ethics, authorship and publishing

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Background of the teaching

Organization: two lectures and a seminar in which the students are divided in groups of six.

Students: 58 PhD-students from BFE and NT faculty, 60% first and 30 % second year PhD-students with widely varying scientific and educational background. 23 out of 54 students have published a scientific article already. In order to make the theme of ethics, authorship and publishing engaging, we sent a survey to the students a week before the lecture and asked them to answer questions on their attitudes towards scientific integrity and publishing. We use the results in teaching to adjust to the level of the students and to fuel discussions.

The lectures are planned based on the following learning outcomes and activities designed to meet these outcomes.

First hour: Authorship

Learning outcome 1: *know, apply and critically reflect on authorship and contributorship criteria for scientific work*

In the previous lectures two days before, the authorship guidelines of the International Committee of Medical Journal Editors (ICMJE) recommendations on authorship (known as “Vancouver recommendations”) have been introduced in the context of the national Guidelines for Research Ethics in Science and Technology. In addition, the students have critically reflected upon authorship practices in their own field of study. In this lecture, we set the stage for a discussion around the learning objective by introducing the following concepts.

- Authorship and its relation to the general ethical theory introduced in the course;
- UiT guidelines for PhD students on norms for co-authorship;
- Authorship criteria for scientific work: the ICMJE (Vancouver) recommendations on authorship and a definition on authorship from one of the articles from the compulsory reading (McNutt, 2018);
- Contributorship as an alternative or addition to authorship, in particular the CRediT taxonomy on contributor roles in scientific work.

In the survey, the PhD fellows were asked to indicate for five cases whether they think the person described should be a co-author on an article, mentioned in the acknowledgements or neither of them. We present the results of this question of the survey and use it as a starting point for the first activity:

	Co-author	Acknowledgement	Neither	Don't know
A master student who made a substantial contribution to the acquisition of data and who drafted the results section, but was not involved in the design of the work *	83,3 %	14,8 %	0 %	1,9 %
A technician who made a substantial contribution to the acquisition of data, but was not involved in the design of the work or drafting and revision of the manuscript *	20,4 %	75,9 %	0 %	3,7 %
A technician who made a substantial contribution to the acquisition of data and revised the manuscript critically, but was not involved in the design of the work or drafting of the manuscript *	68,5 %	25,9 %	0 %	5,6 %
A postdoc who participated in writing or technical editing of the manuscript, but did not contribute in other ways to the work *	46,3 %	48,1 %	0 %	5,6 %
A project leader who brought in money for a project, but did not contribute in other ways to the work *	11,1 %	66,7 %	14,8 %	7,4 %

The students are asked discuss the following questions with their neighbour (5 min):

1. Apply the Vancouver recommendations and McNutt definition of authorship to each of the five cases? Is there one right answer to the survey question?
2. Write down the challenges with the authorship criteria that come up in your discussion. Does a contributorship model instead of authorship solve some of these challenges?

The insights of the students are shared in plenum (10 min).

In the next assignment we take up the homework that the PhD fellows have done before the day of teaching. The assignment was to write a tentative list of articles for the PhD project with tentative contributions from co-workers. The students are encouraged to use the CRediT taxonomy in the assignment. From the survey we know that 36 (out of 54) students have a list with tentative articles from before; 21 of these have a tentative list of co-authors and 7 of those 21 have specified tentative contributions for the co-authors. In the lecture, we motivate why we have asked the students to think about tentative contributions early on in the PhD project and what the regulations at the BFE and NT faculties are when it comes to documenting the contributions of co-authors on published articles. We start the activity in plenum by asking which contributions the PhD fellows have added to the table in the homework assignment.

The students are asked to do the following two tasks individually:

1. Try to translate the tentative contributions to a tentative list of authors. Identify the challenging cases, such as contributions that do not lead to authorship according to recognized authorship guidelines;
2. What can you do now to avoid challenges around authorship later?

In a plenary discussion, we discuss these two questions as well as the question whether it is useful to ask all new PhD students to do the homework assignment as part of their project description and, if yes, how the assignment can be adapted to make it most useful to new PhD students.

Second hour: Publishing ethics

Learning outcome 2: *evaluate the quality of journals you might want to publish in using appropriate ethical guidelines*

From the survey we know that less than half of the PhD students know Open Access journals in their field that could be relevant to publish in; that less than a third of the students are familiar with the concept of predatory journals and that less than one in four is familiar with the Directory of Open Access Journals (DOAJ). In the lecture, we introduce the relevant concepts for an assignment around this learning objective. We introduce two ways to evaluate the quality of journals: using whitelists such as the Directory of Open Access Journals (DOAJ) and the Norwegian channel registry and using appropriate guidelines to judge the quality of the journal by the journal's website.

- The central role publishing plays in science and the importance of quality control for scientific output;
- The various groups of people that have a responsibility in quality control, such as authors, editors, reviewers, publishers, funders.
- Predatory journals, here intended as journals that do not have but pretend to have a good editorial service and quality insurance and ask high publication fees;
- The Directory of Open Access Journals (DOAJ) and the Norwegian publishing channels to find (Open Access) journals to publish in;
- Appropriate criteria to the judge the quality of scientific journals, in particular using a poster from the Committee on Publication Ethics (COPE) and DOAJ.

The students are asked to do the following two tasks individually (10 minutes):

1. Pick a journal you have published in or might publish in. This can be but does not have to be an Open Access journal.
2. Pick some of the guidelines from the poster (suggestions: peer review process, publication ethics, copyright and licensing, author fees) and see whether the journal adheres to these standards judged by the journal's website.

After the assignment, we will sum up the findings per field (economics, social sciences, biosciences, geosciences, chemistry, physics/technology, computer science, mathematics).

Learning outcome 3: *critically reflect upon the responsibilities of authors, editors, reviewers and publishers to ensure high quality of academic publications*

In the lecture, we will introduce a definition of salami slicing and introduce two possible challenges related to peer-reviewing: a reviewer who is biased (hostile or admiring) and a reviewer who asks the authors to cite his own work.

For the assignment, the students are divided in four groups corresponding to four roles in the publishing process: authors, editors, reviewers and publishers.

We ask the students to discuss the responsibilities of their role in pairs for each of the following three questionable practices:

1. A reviewer who is biased (hostile or admiring)

2. A reviewer who asks the authors to cite his own work

We discuss the three cases separately in plenum.

Third hour: reproducibility

Learning outcome 4: *critically reflect upon reproducibility challenges in your own research project*

From the survey we know that the majority of students find it only "somewhat problematic" or "quite problematic" to publish a scientific article without the raw data and in-house developed software that that is needed to reproduce the work

In the third hour (seminar in interdisciplinary groups), the PhD fellows get the following assignment to discuss in their assigned seminar groups:

1. Write down a list with everything that you need to publish so that others can reproduce your research. You can either choose one particular manuscript / paper of your work or your entire PhD work. Include details on providing data sets, methods, codes, *etc.*
2. For each item, write down the most appropriate way to make the data available. Which items on your list can you include in the text of an article? How can you make all other items available? How can you ensure everyone has access to this information, now and in the future?
3. Present your list in your seminar group. Ask each other critical questions about what is needed to reproduce the research and how this can be made available in the most appropriate way.