

Preparing students for their half day seminar

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A course typically ends with an assessment of what has been learned. Students get some feedback on knowledge, skills, or competences they have acquired and have not yet fully acquired. Teachers can identify part of the curriculum where students need more support to reach the intended learning objectives (ILOs). Traditionally, this assessment is performed via an exam (written or oral) or a written assignment. At a Ph.D. level these assessment formats may not be the most relevant since the main ILOs are competence-based. Asking the students to use the knowledge, skills, and competences that have developed during the course in a situation of their choice (typically one of their Ph.D. project) and discuss their experience with the class is an alternative format. The hope is that the students will be exposed to a variety of realistic situations, with opportunities to get and provide feedback, in a safe environment. It is a formative assessment favoring reflexion upon the practical application of the content of the course instead of providing a grade.

I have introduced this assessment format when I became the course director of a Ph.D. course called 'Epidemiological method in medical research', two years ago. I asked students to prepare a 10 minutes presentation for the last afternoon of the course, which will be followed by a 10 minutes discussion with the class. Even though students were generally satisfied, I do not think this assessment format completely fulfilled its promises:

- the aim was sometimes **misunderstood** leading to presentations and discussion outside of topic of the course. Students, which are mainly medical students, would typically mostly elaborate on the medical aspect of a study while the course is about methodology (study design and data analysis). This methodological type of presentation seemed abstract to the students. I think too little was done during the course to ensure that students understood this format (mainly an oral explanation by the teacher).
- the **quality** of the student presentations was variable, often good but sometimes poor. I felt this was sometimes due to a lack of involvement from the students but also because young Ph.D. students may not already have collected

their own data, and they felt they had no material for their presentation. This is unfortunate as, ideally, this course should be taken early in the Ph.D., before the student has had to make decision about study design and data analysis.

- the **quantity** of presentations make it difficult for the students and the teacher to focus during the whole session. Students were divided into two groups of 12 students, leading to 4 hour of presentations/discussions. Toward the end of the day, there was much less interactions.

This project aims at mitigating these issues, by involving the students earlier during the course in the preparation of their presentation, allowing group presentation, and providing them a source of inspiration and feedback.

The course

The course where I have implemented this project is a Ph.D. course called **Epidemiological methods in medical research** (7 ECTS). It is 10 full day course (once day a week) alternating between lectures and practicals (except the last day). The audience is students in health science, e.g. medicine or epidemiology. The class used to be for 24 students but, due to the high demand, I included 30 students this year. The pedagogical team is composed of biostatisticians and epidemiologists. The learning objectives include competences in biostatistics and epidemiology (e.g. choice of a study design, notion in causal inference and statistical modeling) as well as some practical skills like programming. At the end of the course, participants should be able to read and understand scientific articles in epidemiology, design and analyze standard studies. Students pass the course by achieving 80% attendance and attending and actively participating during the half day seminar.

The project

The main element of the project was to organize a **peer-feedback** session mid-way through the course. To prepare this session, the students were reminded on day 5 about their contribution to the half day seminar. Three possible formats were suggested:

- (i) presenting results from your own research project with focus on the methodology
- (ii) discussing the planning of a study
- (iii) discussing a methodological point based on a scientific article. Examples of article were uploaded on the course webpage.

Presentation could be done alone or in pairs. Students were asked, as homework, to reflect on the general content of their presentation and use a template to structure

their reflexions (see appendix A). To help them a document describing important dates, expectations for the presentations, and some advices was provided (appendix B).

The peer-feedback session took place on day 6 and was structured as follow:

- in pairs, each student presents his plan to another student. The other student provides some feedback (10 minutes per student).
- each student updates (individually) his project description and write down feedback to the teacher (10 minutes). He sends an email with the project description to the course director.

I then read each project description and provided individual feedback to the students by email.

Outcome

27 out of 30 students (90%) had sent their project description. I received two more project descriptions a week later, so 29 out of 30 students (96.7%). All students who sent me a project description had title and identified a theme. Two students decided to work in pair and 27 alone. A large majority of the students planned to present results from their own data analysis (20 out of 29, 69%). A few planed to present the design of a new study (6 out of 29, 21%) and two (7%) about a methodological point based on scientific articles. For one student it was unclear which format he has chosen. None of the student referred to articles uploaded on the course webpage.

11 students (31%) filled the "feedback to the teacher" section or wrote some feedback in the email containing their project description. One was a practical question about the last day, 5 were asking for feedback on their project description. The remaining 5 provided feedback on the organization of the course. I would judge most of the feedback about the course legitimate, except one that misread the course description and was therefore disappointed about the course.

Providing individual feedback to each student required about 6 hours of work but gave me an overview of the topics and thought process of the students. I had some concerns about the scope of the study for only a minority of the students (about 5 students, see appendix C for an example) and could communicate with them. The section 'Plan' was not filled or with very minimal input for several students (about 10 students) while a few indicated a detailed timeline. 8 students (27.6%) thanks me for the feedback and indicated it was useful.

All but one (due to illness) students made their presentation the last day. Subjective assessment of the quality of the presentations by the teachers was very positive.

In the group I was responsible for about a half of the students would end their presentation asking a question to the audience about a methodological point e.g.:

- what would be the most appropriate: include death in a composite endpoint or treat it as a competing risk?
- which one of the two study designs, self-controlled case-series or interrupted time series, is the most appropriate for my study?

Feedback from the student about the last half day was only positive (13 out 30, i.e. 43.3%, provided feedback), e.g.:

- Great – it was really nice to hear about the different project and how they used the methods.
- The presentations were much more informative and interesting than I anticipated!
- Nice, but be aware, that things like this is also taught in similar causes. Nevertheless I think you should keep it as it is.
- Really good seminar, very comfortable and good atmosphere.

Discussion

A very large majority of the students sent me the project description and some showed clear interest in getting some feedback. So the peer feedback session may help students getting involved early in their contribution to the half day seminar. I think that it also improved the communication with the students and helps clarifying what was expected from them at an early stage. I was positively surprised by the fact that most students already seemed to have a somehow clear idea about what they want to present. Compare to previous years a few more students chose to present about planning a study / presenting an article, and they seemed confident about it. So this activity may have been beneficial to the young Ph.D. students.

Surprisingly, only a minority of students provided feedback or asked for feedback. I am not sure how to interpret that: the student is satisfied and does not need help, lack of interest, or not feeling safe enough to provide feedback.

I have also mixed feelings about the usefulness of getting feedback on the content of the course. On one side it is interesting to get access to what the students think, clarify misunderstandings, and fix what can be improved. The students may also appreciate being heard. In practice, I got few answers so I do not know if the comments represent an individual or a majority of the class. I may get worried and/or

implement a change because of a one or few comments that may not be representative of the rest of the group. A follow-up feedback session, involving the whole class on selected topics, would help clarifying the representativity of the feedback. But since it would take some more time, I see it appropriate only if some serious concerns are raised.

I presented the activity and discussed the outcome with the former course director, Professor Per Kragh Anderson. One important point for the success of the last day is that the focus of the presentations should be about the methodology and not the (medical) application. He pointed out that the template provided to the student was not very explicit about this point. We also discussed how to facilitate interactions between students, in particular young Ph.D. students who (I think) would benefit from working in pairs.

Overall, I think this peer-feedback session is an improvement. It seems to be helpful to (at least some of) the students. It gives me an idea of the class and provides me feedback from the students mid-way through the course. Having more knowledge about the students will also help me divide the students into more relevant groups the last half day (this year we will be 3 teachers so have groups of 9 to 10 students which will reduce the quantity of presentations).

For the following years, I think the template for the project description can be improved: to stimulate more feedback from the students and better reflect the expectations for the presentations. My own feedback could also have been better if I would have spread out the workload (I was sick that week which did not help). Giving feedback is a difficult task as good feedback requires time and that the student has provided a substantial description of his plan.

Appendix A: project description

Project description
<p>Name:</p>
<p>Content: on what topic would you like to present? Alone or in pair (with who)?</p> <p>own research or article from the literature? Which article?</p> <p>what would be the take home message or key discussion point?</p>
<p>Form: will you follow the usual intro/method/result/discussion?</p> <p>what do you anticipate will be difficult to communicate?</p> <p>visual / graphical illustration that could summarize the key message</p>
<p>Barriers: what may limit your ability to make progress and possible remedies</p> <ul style="list-style-type: none">- Practical (e.g. access to data, time, coordination with the other student, ...)- Theoretical (e.g. defining a research question, understanding of a statistical method, programming skills, ...)
<p>Plan: What will be the next steps?</p> <ul style="list-style-type: none">- date 1: step 1- date 2: step 2-
<p>Feedback to the teacher:</p>

Appendix B: guidelines

Planning the scientific presentation of March 23rd

Epidemiological methods in medical research 2023

Timeline

- Preparation: reflexion about a subject: who, what, why, how
fill the project description template (see below)
- 23rd February (14.00-14.30): Peer-feedback session
(17.00): send project description to brice.ozenne@nru.dk
- 20th March (18.00): send pdf of the presentation + short abstract
to brice.ozenne@nru.dk
- 23th March (13.00-17.00): the class is split in 3 groups (BO,KSL,AMNA) of 10 students,
Each student has 10 min for the presentation and 8 min discussion

About the presentation

To exemplify and discuss the use of epidemiological concepts/statistical methods

- ➔ Ideally based on one of your Ph.D. project: can be a study you are doing, have already published, or that you are planning (pre-register a study <https://aspredicted.org/>).
Otherwise based on a scientific paper (e.g. identify a methodological challenge you met during your Ph.D. and look for one or few articles on the subject)
- ⚠ Less is often better. Prefer to present in detail how you evaluate and communicate about the association between one exposure and one outcome than to present all the results from a project.
- ➔ Can be done alone or in pairs
- ➔ Can be about: how 'standard methods' can be used in your research
how to communicate results from 'standard methods'
how specificities in your study design challenges 'standard methods'
pro/cons of two designs or statistical methods (traditional vs. new) in your field
- ⚠ the focus should be on the methodology more than on the clinical relevance/originality.
- ⚠ should be focused about a specific point – not a description of your Ph.D.

Recommended structure:

- introduce the context - 1 or 2 slide
- describe the research question - 1 slide
- describe the methodology (data collection, statistical approach) – 2 or 3 slides
- ⚠ avoid listing statistical methods. Instead first state what you want to estimate (e.g. ratio between the 1 year risk of death with disease A vs. disease B) and then how you estimate it.
- brief representation of the data + one or two key results – 2 or 3 slides
- ⚠ graphical representations are encouraged: e.g. do not just report a hazard ratio, illustrate the survival for (specific) patients under the different exposures.
- conclusion and comments about the strength/weakness of the methodology – 1 slide
(adequation between the methodology and the research question)

About the short abstract

To give an idea about the content of the talk to the other students and to the teacher

- ➔ It does NOT need to follow the usual “intro/method/results/discussion” format
- ➔ Short is good (around 50-100 words): just describe in a few sentences what is your key message or what you are going to present, e.g.:
“In this presentation I will present the analysis of registry data to investigate whether hormonal contraceptive should be considered as a risk factor for depression. I have been using a Cox model to model this association and use survival curves to illustrate the risk of depression under different type of contraception. One difficulty I met was that some women changed type of contraception during their follow-up and I will discuss solutions I considered.”

About the peer-feedback session

Brainstorm with another student topics and structure for the presentation

- ➔ In turn discuss the **content/form/barrier/plan** for your presentation (10 min each)
- ➔ Individually: based on your discussion update your project description (5 min)
- ➔ Individually: fill the section **feedback** with comments about the peer-feedback (5 min). You can also indicate if you would like some advice from the teacher or if something is unclear about how the scientific presentations will take place.

⚠ the peer-feedback session and project description are meant to help you in defining and planning your work. The project description you send at the end of the day does not need to be finished/polished/perfect. It should give an idea to you and to the teacher of where you are at and identify challenges and remedies.

Appendix C: example of feedback

<p>Dear [REDACTED]</p> <p>Thanks for your project description and the nice feedback.</p> <p>From what I can see I would try to put a little bit more focus on the methodological aspect. Here are some possibilities:</p> <ul style="list-style-type: none">- any challenges that may arise and how to meet them, e.g. how to account for drop-out?- choices have been made in the choice of the outcomes e.g. looking at the incidence rate but one could also have consider the risk. Is one more appropriate than the other in your application? <p>Note that you presentation does not need to match the real data analysis nor the protocol (this is just for this course). In particular you should probably focus on one or two outcomes.</p> <p>Best regards Brice</p>
<p>Dear [REDACTED]</p> <p>Thanks for your project description. Yes one possibility would be to discuss about propensity score matching:</p> <ul style="list-style-type: none">- how does it works? what does it tries to achieve?- why was it chosen in that study? How does it compare to alternative methods? (e.g. is it more user-friendly, better statistical properties, or specific reasons to use it or not). <p>This way you could be lighter on the coding and more conceptual (but you'll have to read a bit on propensity matching - maybe your co-authors can help you).</p> <p>Best regards Brice</p>

In the first project description, there was nearly no methodological consideration (only mention of the medical aspect). The first email aim to encourage the student to re-focus on the medical aspect of his study.

In the second project description, the student was concerned about his programming skills to implement a statistical method. The plan is also ambitious so with the second email I suggested that the student mostly discuss at a higher level (motivation, pro- and cons-) to be less dependent on the technical part.