

Course analysis AK2030, AK2036, AK2038, AK2040

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Process: The student's opinion on the course were collected using the LEQ. A meeting with the teachers to analyse these results was held.

Student meeting: Due to increased general workload due to the situation from Corona, arranging and performing a meeting with student representatives and program responsables was determined to be outside of the current capacity.

COURSE DESIGN

The 4,5 credits version of the course consists of 4 campus lectures, 7 video lectures to watch at any time, 2 flipped classroom-campus lectures, seminars (1,5 credits) and an exam (3 credits). The lectures and seminars are complemented with quizzes.

The 7,5 credits versions on master level also complete a 3 credit "Project part" assignment related to articles in their field (AK2036&AK2038) or meta-mathematics (AK2040). The longer version on PhD level instead takes an essay part, where relate the course to their field of research (3 credits). The FAK3014 course does not take the lecture on risk or ethics, three seminars (1 credits) and a shorter exam (2 credits). The FAK3012 course only take the PhD Essay.

This analysis focuses on the master-level courses, as there were to few responses from the LEQ to generate a report for the PhD courses.

THE STUDENTS' WORKLOAD

Does the students' workload correspond to the expected level (40 hours/1.5 credits)?
If these is a significant deviation from the expected, what can be the reason?

On average students stated workload correspond to what could be expected. It is much more common that students spend less time than expected than that they spend more time than expected. An additional survey regarding workload was performed during the course, but the analysis of the results have been postponed due to Corona. One take-away that was very clear from that survey was that many students were unaware of how many hours they were expected to spend on the course. That could explain comments such as "this course demands a lot of your time" (paraphrased to preserve anonymity) from a student who reported working 6-8 hours out of expected 20, and "average workload" from a student who worked 3-5 out of 12 hours, which are recurring in evaluations. Due to the low number of answers, there were no clear differences between the course codes.

THE STUDENTS' RESULTS

How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?

Results from the Period 3 exam:

	AK2030	AK2036	AK2050	FAK3014	FAK3137	Grand Total
A	29%	12%				15%
B	10%	7%	25%			8%
C	13%	22%				14%
D	13%	8%				8%
E	8%	2%				4%
F	10%	15%	13%	23%	50%	15%
FX	8%	2%	13%			5%
P				54%	33%	8%

Result, year average:

	AK2030	AK2036	AK2038	AK2050	FAK3014	FAK3024	AK2040	FAK3137	FAK3138	Grand Total
A	14%	15%	14%	20%			25%			15%
B	13%	13%	20%	14%			22%			13%
C	17%	15%	12%	8%			25%			15%
D	13%	14%	10%	28%			3%			13%
E	8%	10%	8%	8%			3%			9%
F	20%	19%	22%	12%	31%	67%	10%	40%	25%	19%
FX	15%	14%	12%	10%			13%			13%
P					69%	33%		60%	75%	3%

Results are similar to what could be expected and does not differ significantly from the year average, and there are no interesting differences with regards to grade distribution between the codes, given the number of students. An exception is that it is clear the PhD students have a lower passing rate than master students both in general and for this exam. PhD students take the same exam but a higher score is required for passing. No clear explanation offers itself. A note: the tables have been edited to exclude course codes with so few students that anonymity could not be preserved.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

Comments can be summarised into that the seminars are well liked, that the video lectures are well liked and that some students do not understand why they are to take this course. These are the same comments that have appeared in previous evaluations. We are planning on increasing the number of video lectures.

I do not think that there is a widespread confusion why students are to take the course. Rather, there I believe there is a portion of the students who cannot see the relevance, while others at least does not think it is particularly irrelevant. It seems plausible that these students also struggle in general with the course, given a lower motivation to learn. Since the students come from a wide range of master programs, it could be that there are certain programs who think that this course (their course version) is less relevant to them than others. However, the LEQ questionnaires does not allow for that kind of information. What we can see is that students from the mathematics program question the relevance of the mathematics project part. This part is being revised substantially and a completely new project is planned for the autumn, period 1.

Another reason might be that students view themselves as future engineers and not future scientists, and as such will not perform experiments, create models or be a part of other activities that might require methodological skills. I cannot say whether this belief that methodological knowledge is unnecessary for an engineer is correct or not, but from our perspective that is not relevant. Our job is to make sure that students have the appropriate skills should they choose to become scientists or engage in activities requiring methodological knowledge. That is the same for many courses – they teach skills that are very useful in a particular line of work, but not if you do not choose to go that way. Given that a masters degree is a requirement for becoming a PhD, all students should be prepared to do research, and then a course such as this is necessary.

Three open question were added this LEQ, asking about the flipped classrooms. Opinions were split, but the general impression was that they were okay but could be better. Several comments said that a more straightforward Q/A session might have been better, other said that a more seminar-like structure would have been preferred. Given that we are moving most lectures online, revising the structure of the flipped classroom might be a useful idea.

SUMMARY OF STUDENTS' OPINIONS

Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

The general outcome is positive. For AK2036 with 41 respondents aspects of the LEQ are between 5-5,5, on a scale where 4 would be neutral. For AK2030 with 21 responses, all aspects of the LEQ are between 4-6, with 9/12 aspects being between 5-6. AK2040, with 10 responses, rate aspect 3-22 between 4-5,7, but aspect 1 and 4 3,2 and 2,6 respectively. AK2038, with 3 responses, does not allow for as a clear description as the ratings vary widely between aspects. This is an artifact created by the low number of responses, and does not allow for any interpretation.

OVERALL IMPRESSION

Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.

The general impression in the meeting is that we are, on average, giving a good course and that the students are performing as could be expected. The main issues are that students are not spending as much time as could be expected and that they do not see the relevance of the course. The first issue is hard to correct without increasing stress for students already spending more time than expected, and it is not clear that time spent studying is a goal in itself. Rather, we should encourage students to consider the time spent studying and evaluating if this time is sufficient given their goals in the course. One option could be weekly optional self-tests. Such a test could also collect data on how much time was spent on average that week.

The second issue is even harder to correct, given the multitude of programs taking the course. Options that have been discussed in the past are collecting a "database" of cases where methodological issues has played a part in research for different areas. While this might be a good idea, I am not as sure anymore that this would convince anyone who believes this course to be irrelevant. The content of this course is abstract and the course is about abstracting, seeing commonalities between very different situations. We are not the only course teaching how to correct errors in a model or that good control is important when running an experiment. Typically, these practical aspects are taught when teaching how to perform that particular method. If one cannot see

the common aspects between sciences, or believes that they are irrelevant as one particular person only works with one particular task, then this argument is not going to be convincing.

ANALYSIS

Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason be? Are there significant differences in experience between:

- students identifying as female/male?
- international/national students?
- students with/without disabilities?

For course codes AK2030, AK2038 and AK2040 the students rated aspects 1 and 4 lower than most of the others. These are related to meaningfulness: 1) I worked with interesting issues, and 4) the course was challenging in a stimulating way. Aspect (1) has already been addressed. Aspect (4) is to some degree a consequence of (1), as one is more prone to consider the type of thinking that this course features stimulating if one considers these issues interesting. One other factor could be the bonus point system, featuring quizzes with deadlines. In previous evaluations we have seen that keeping up with these quizzes (rather than the quizzes themselves) is perceived challenging in a negative way, despite that these are optional.

It is hard to tell if there are any significant differences between student groups that are not artefacts. For instance in AK2036, international exchange students and "do not wish to state" rank the aspects significantly lower than the others, but the number of respondents from these groups are probably close to 3 (given that there is no response for some questions), and it is unknown what the total number of students are from these groups are and if these are representative. In comparison, international mastersstudents rank the aspects in about the same way as Swedish students, and no clear analysis offers itself of why exchange students would have a more negative perception of the learning environment than the international mastersstudents.

Disabilities: while this also most likely was a group of around 3 respondents for AK2036 (the only course with a response for this aspect) and the same comment as above hold, one can note that these ranked most of the aspect somewhat lower than the other students. However, the students offered comments that we did not have a formal break in the seminars (although the student noted that one could take one if one wanted to), and that we gave out seminar handouts which features quite a bit of reading which were not available in advance. This was discussed in the meeting and we will improve both aspects. In the seminars, we usually give the students a longer period of work (1 hour) and instruct the students to take a break whenever they feel they need one, but many don't take any break at all. We can start with announcing "now is a good time for a break", to encourage students to take this break. We will provide the seminar handouts online prior to the meeting, either to those who ask for it or to everyone. Teachers have had slight variations in their handouts, so we will work on combining these into one version.

PRIORITIZED COURSE DEVELOPMENT

What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?

- Creating a new project part for AK2040
- Changing the flipped classrooms

- Reminding students to take breaks during seminars
- Sending hand-outs to students with disabilities prior to the seminars

Areas of interest

- Weekly self-tests
- Examples of uses of methodological knowledge
- Changing the bonus point system