Report - SF2822 - 2022-09-27

Respondents: 1
Answer Count: 1
Answer Frequency: 100.00%

Please note that there is only one respondent to this form: the person that performs the course analysis.

Course analysis carried out by (name, e-mail):

Jan Rolfes (jrolfes@kth.se)

DESCRIPTION OF THE COURSE EVALUATION PROCESS
Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.

We have used the course evaluation. Because I was on a move to Sweden, the first three lectures have been given via Zoom. The students could contact me via e-mail and could schedule office hours. We have not
specifically addressed aspects regarding gender and disabled students, except following standard KTH practice.

DESCRIPTION OF MEETINGS WITH STUDENTS
Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)

I met with students during the lectures and stayed in the lecture hall to answer potential questions, which in some cases lead to some fruitful discussions on the blackboard. On projects/exercises, I tried to nudge them into the right direction without giving too much away.

COURSE DESIGN
Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.

The course covers nonlinear programming. The course is based on projects, where students get training in modeling and analysis of practical problems, in addition to lectures and tutorials, where students get an understanding of theory and methods. The second project is optionally an implementation project. This is the same setup as in the previous years.
The group sizes for the project groups were two or three persons and the groups were selected randomly for the first round and then again mostly randomly for the second round (We ensured, that no two group members keep together in order to train them in collaborating with different characters).
The projects are presented in the lecture hall. First, students who have worked on the same project were grouped together and discussed their own projects intensely. As a second part of the lecture, students who have worked on different projects were grouped together and needed to explain their project to students not familiar with the matter. In addition, my TA Yuexin and I jumped into these discussions in order to give some additional feedback.
I was new to the course and hence closely followed the setup from previous years, but I tried to revise the slides a bit together with Anders Forsgren.
I used a laptop, projector and blackboard/iPad as support for the teaching. Moreover, I tried to complement the slides with some blackboard examples and some computational examples using GAMS and Matlab.

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?

Counting for ten weeks and 7.5 credits would give 20 hours per week. Since the students reported a median workload of 18-20 hours per week, which fits the expected workload quite well.

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?

The results of the exam were good. The first exam, on June 2nd, had 2 students failing and 31 passing, which seems to be better than in the previous years. The re-exam had one student passing and one student failing. The reason for the improved performance might be, that 2 students only passed after an Fx re-exam. Besides of this, I would think that the result falls in a standard deviation of the common passing /failing rates.

STUDENTS´ANSWERS TO OPEN QUESTIONS
What does students say in response to the open questions?

The students appreciated the blending of theory and projects. The TA Yuexin got a very positive feedback. Some students complained about the different efforts of their group members. Some students critized how the slides were linked to the teaching.

SUMMARY OF STUDENTS' OPINIONS
Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

Students seem to struggle with the slides and want more illustrating examples of the key concepts.
They particularly liked the projects and exercises.

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 course offers a broad overview of the methods currently used to tackle non-linear optimization problems. The students demonstrated both, in the exam and the projects, that they are very strong in applying these methods to particular problems. Thus, I would assess, that the course reached its main goal properly.
Moreover, as being my first time teaching in KTH, I was impressed by the dedication and passion the students brought to the course. Every question directed to me showed me they were fully invested in their work and the lecture. Mostly they did not ask too much for clarifications of the course material but instead asked for additional material, refinements of the presented methods and more. Hence, I would assess, that the course also fostered the student's passion for the topics covered, which, in my opinion, is essential for every university course.

The evaluation taught me mainly two things, namely that the exercises and projects seem to be very much up-to date and are well-received by the students. The (earlier) lectures however might be worth revisiting.
Since I only moved to Stockholm after the course started, I relied heavily on the provided material. Thus, despite of slight revisions of the slides, the course material remained mainly unchanged.

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 for these be? Are there significant difference in experience between:
- students identifying as female and male?
- international and national students?
- students with or without disabilities?

Based on the evaluation, I would identify the exercises and projects as the strong side of the course and the lectures as the weaker side.

The international students seem to evaluate the course better overall. It would be interesting to see, whether this is a pattern, that can be observed, but from the previous two years not enough data is available.

PRIORITIZED COURSE DEVELOPMENT

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

I agree with the students, that the slides should be revisited. In retrospect, I think introducing the very general form of the FONOC and SONOC conditions earlier and intensely and then spending more time on illustrating (linear) examples would be preferable. Given my gained experience with this course, I would be extremely happy to give the course next year and implement these changes.
Maybe changing the modeling language to Matlab or preferably Python with the use of an academic license of a solver such as IPOPT or SNOPT would be beneficial as well, but this might just be my personal taste.

OTHER INFORMATION

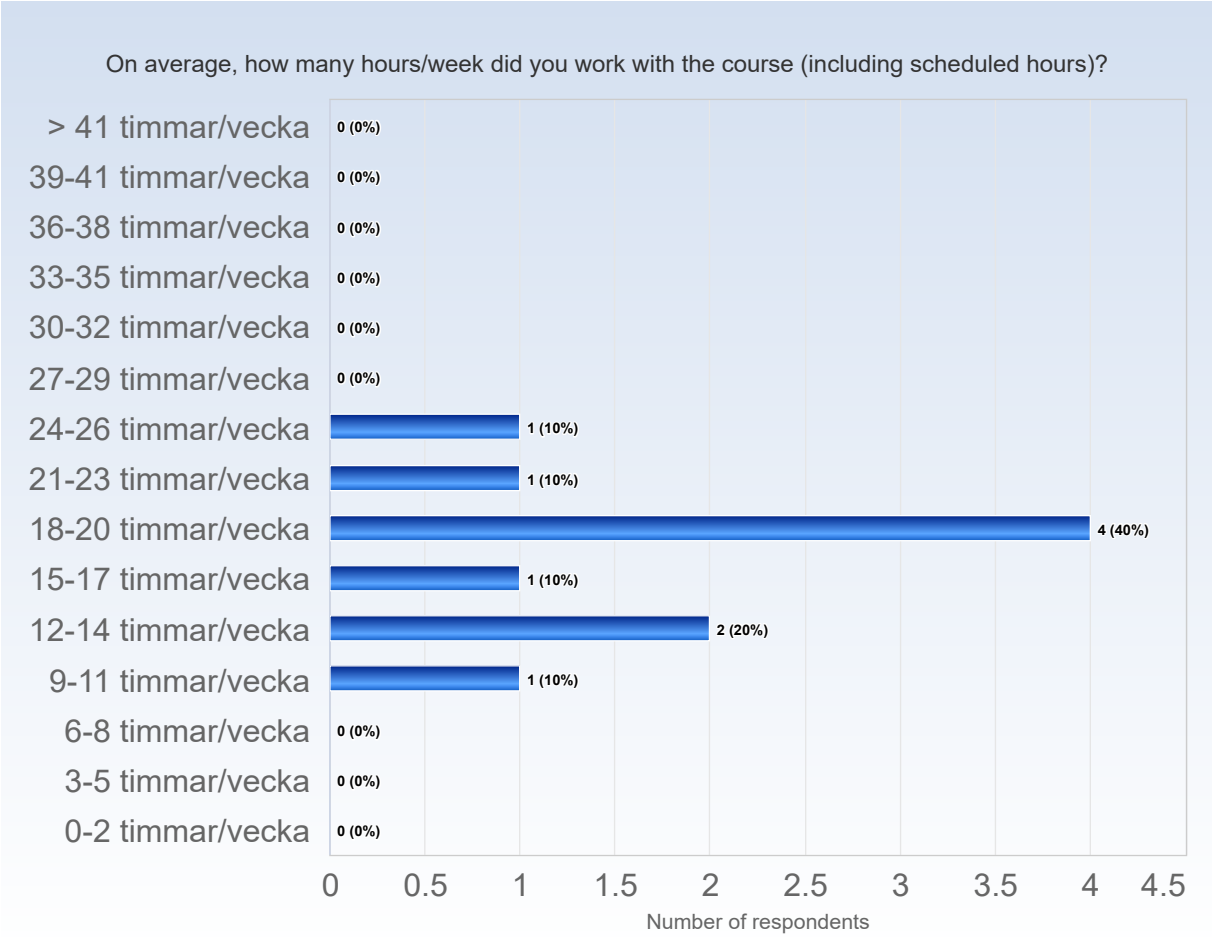
Is there anything else you would like to add?

Yuexin Cao did a great job with the exercises. Although it was his first time teaching he was very reliable and was highly appreciated by the students.

SF2822 - 2022-06-23

Antal respondenter: 41
Antal svar: 10
Svarsfrekvens: 24,39 %

ESTIMATED WORKLOAD



Comments

Comments (I worked: 9-11 timmar/vecka)

The workload is mostly concentrated around the projects. I think at those points it is almost unreasonable if you end up with a "bad group". If your group is decent, the workload will also be decent.

Comments (I worked: 12-14 timmar/vecka)

I always tried to read the slides before going to lectures

Comments (I worked: 15-17 timmar/vecka)

Attendance in scheduled classes and time for the projects

Comments (I worked: 18-20 timmar/vecka)

There was a lot of courses
I would need to work by myself around 1h30 on each course
+ Lots on time on the project (around 15 hours each)

Comments (I worked: 24-26 timmar/vecka)

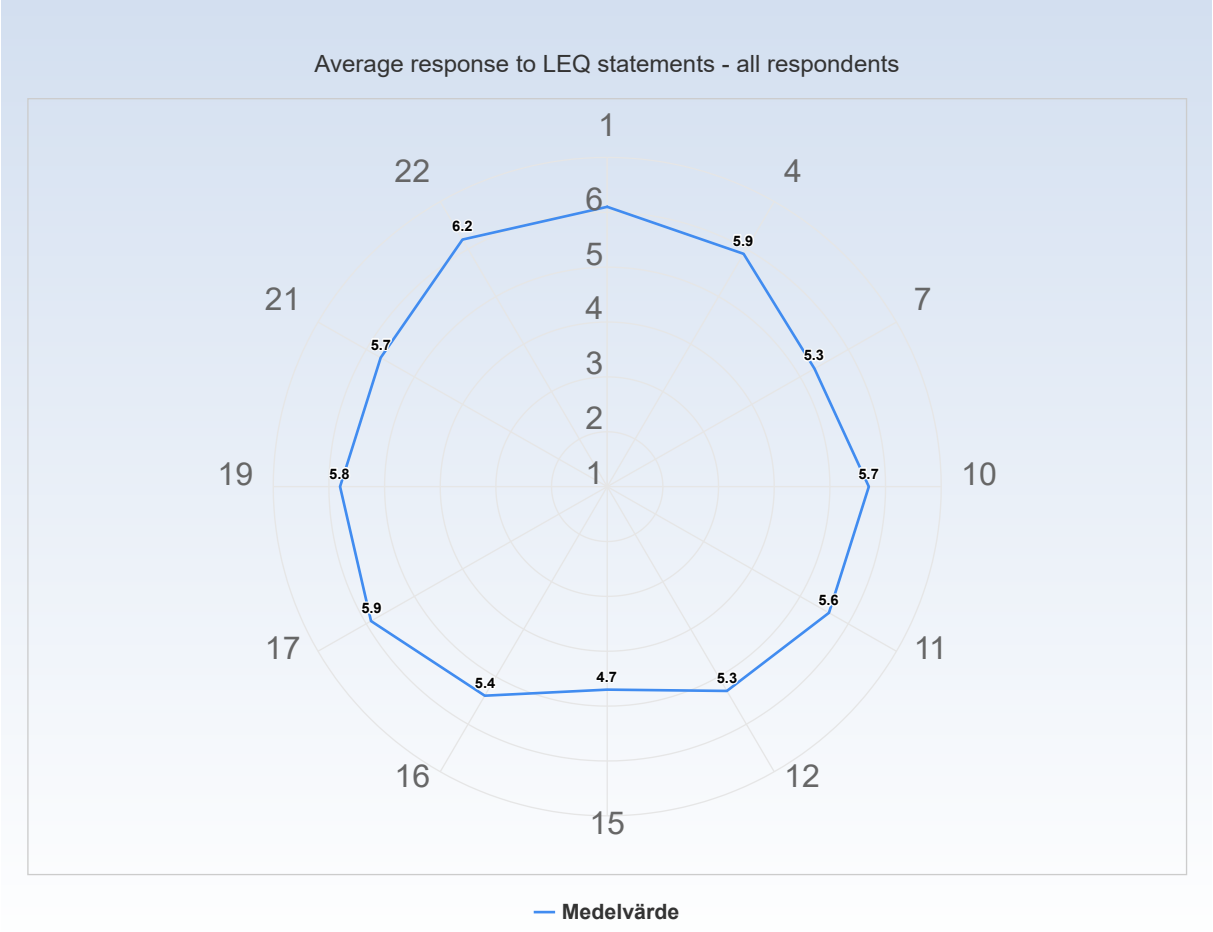
Graded group projects forced me to spend a lot of time with those since my partners have lower aspirations.

LEARNING EXPERIENCE

The polar diagrams below show the average response to the LEQ statements for different groups of respondents (only valid responses are included). The scale that is used in the diagrams is defined by:

1 = No, I strongly disagree with the statement
4 = I am neutral to the statement
7 = Yes, I strongly agree with the statement

Note! A group has to include at least 3 respondents in order to appear in a diagram.



KTH Learning Experience Questionnaire v3.1.4

Meaningfulness - emotional level

Stimulating tasks

1. I worked with interesting issues (a)

Exploration and own experience

2. I explored parts of the subject on my own (a)
3. I was able to learn by trying out my own ideas (b)

Challenge

4. The course was challenging in a stimulating way (c)

Belonging

5. I felt togetherness with others on the course (d)
6. The atmosphere on the course was open and inclusive (d)

Comprehensibility - cognitive level

Clear goals and organization

7. The intended learning outcomes helped me to understand what I was expected to achieve (e)
8. The course was organized in a way that supported my learning (e)

Understanding of subject matter

9. I understood what the teachers were talking about (f)
10. I was able to learn from concrete examples that I could relate to (g)
11. Understanding of key concepts had high priority (h)

Constructive alignment

12. The course activities helped me to achieve the intended learning outcomes efficiently (i)
13. I understood what I was expected to learn in order to obtain a certain grade (i)

Feedback and security

14. I received regular feedback that helped me to see my progress (j)
15. I could practice and receive feedback without being graded (j)
16. The assessment on the course was fair and honest (k)

Manageability - instrumental level

Sufficient background knowledge

17. My background knowledge was sufficient to follow the course (f)

Time to reflect

18. I regularly spent time to reflect on what I learned (l)

Variation and participation

19. The course activities enabled me to learn in different ways (m)
20. I had opportunities to influence the course activities (m)

Collaboration

21. I was able to learn by collaborating and discussing with others (n)

Support

22. I was able to get support if I needed it (c)

Learning factors from the literature that LEQ intends to examine

We tend to learn most effectively (in ways that make a sustained, substantial, and positive influence on the way we think, reflect, act or feel) when:

a) We are trying to answer questions, solve problems or acquire skills that we find interesting, exciting or important

b) We are able to speculate, test ideas (intellectually or practically) and learn from experience, even before we know much about the subject

c) We are able to do so in a challenging and at the same time supportive environment

d) We feel that we are part of a community and believe that other people have confidence in our ability to learn

e) We understand the meaning of the intended learning outcomes, how the environment is organized, and what is expected of us

f) We have adequate prior knowledge to deal with the current learning situation

g) We are able to learn inductively by moving from concrete examples and experiences to general principles, rather than the reverse

h) We are challenged to develop a true understanding of key concepts and gradually create a coherent whole from the content

i) We believe that the work we are expected to do will help us to achieve the intended learning outcomes

j) We are able to try, fail, and receive feedback before, and separate from, each summative assessment of our efforts

k) We believe that our work will be considered in an honest and fair way

l) We have sufficient time for learning and devote the time needed to do so

m) We believe that we have control over our own learning, and not that we are being manipulated

n) We are able to collaborate with other learners struggling with the same problems

Literature

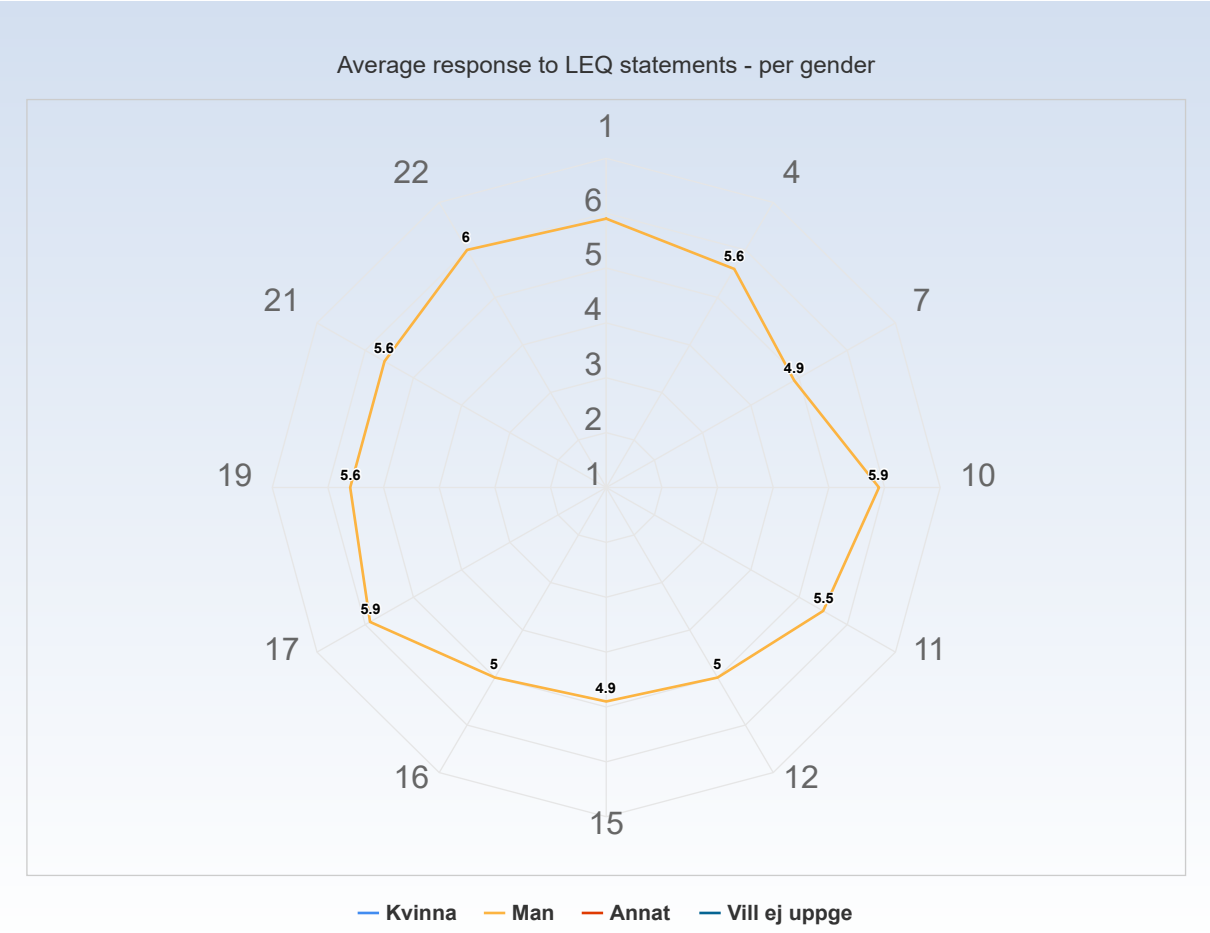
Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

Elmgren, M. & Henriksson, A-S. (2014). *Academic Teaching*, Chapter 3, pp. 57-72. Lund: Studentlitteratur.

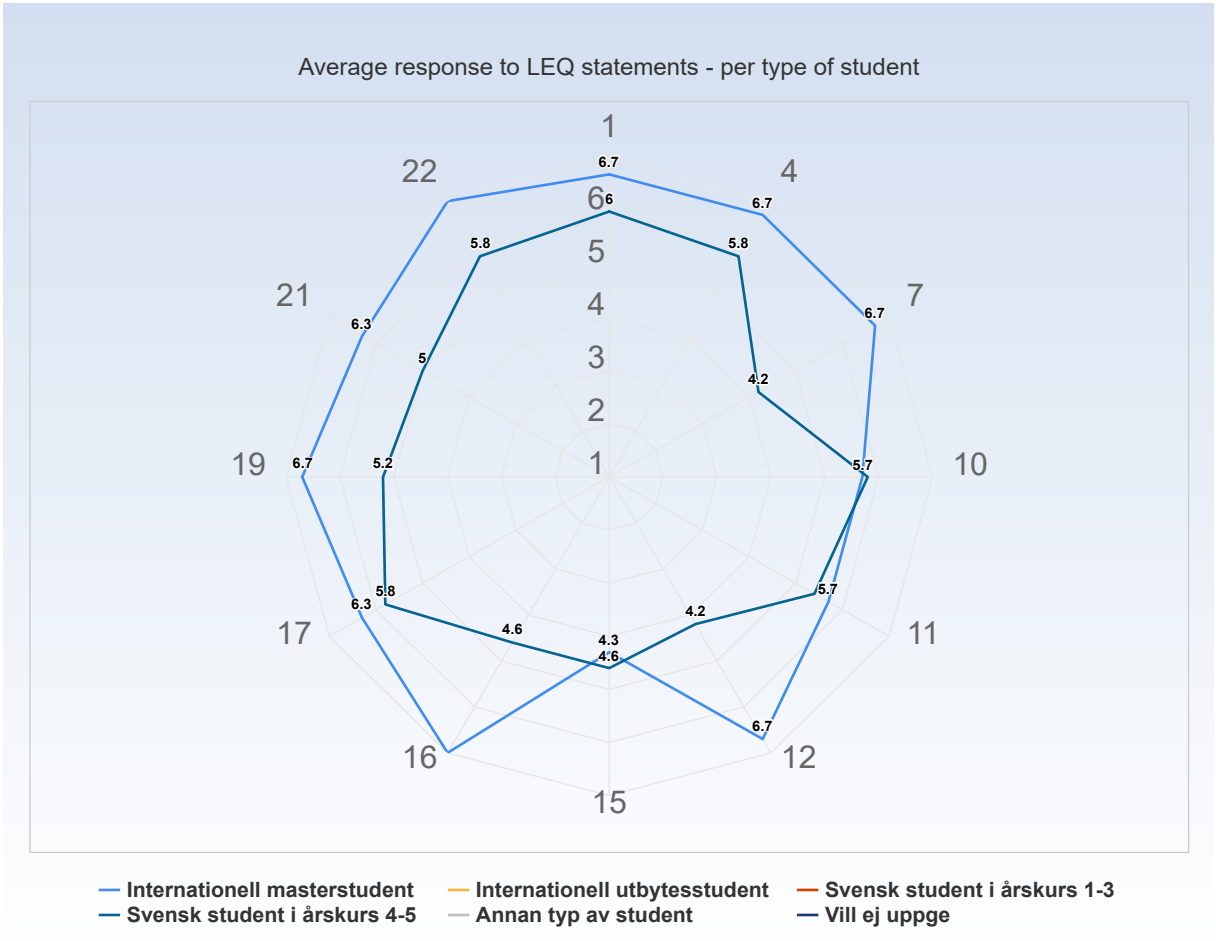
Kember, K. & McNaught, C. (2007). *Enhancing University Teaching: Lessons from Research into Award-Winning Teachers*, Chapter 5, pp. 31-40. Abingdon: Routledge.

Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.



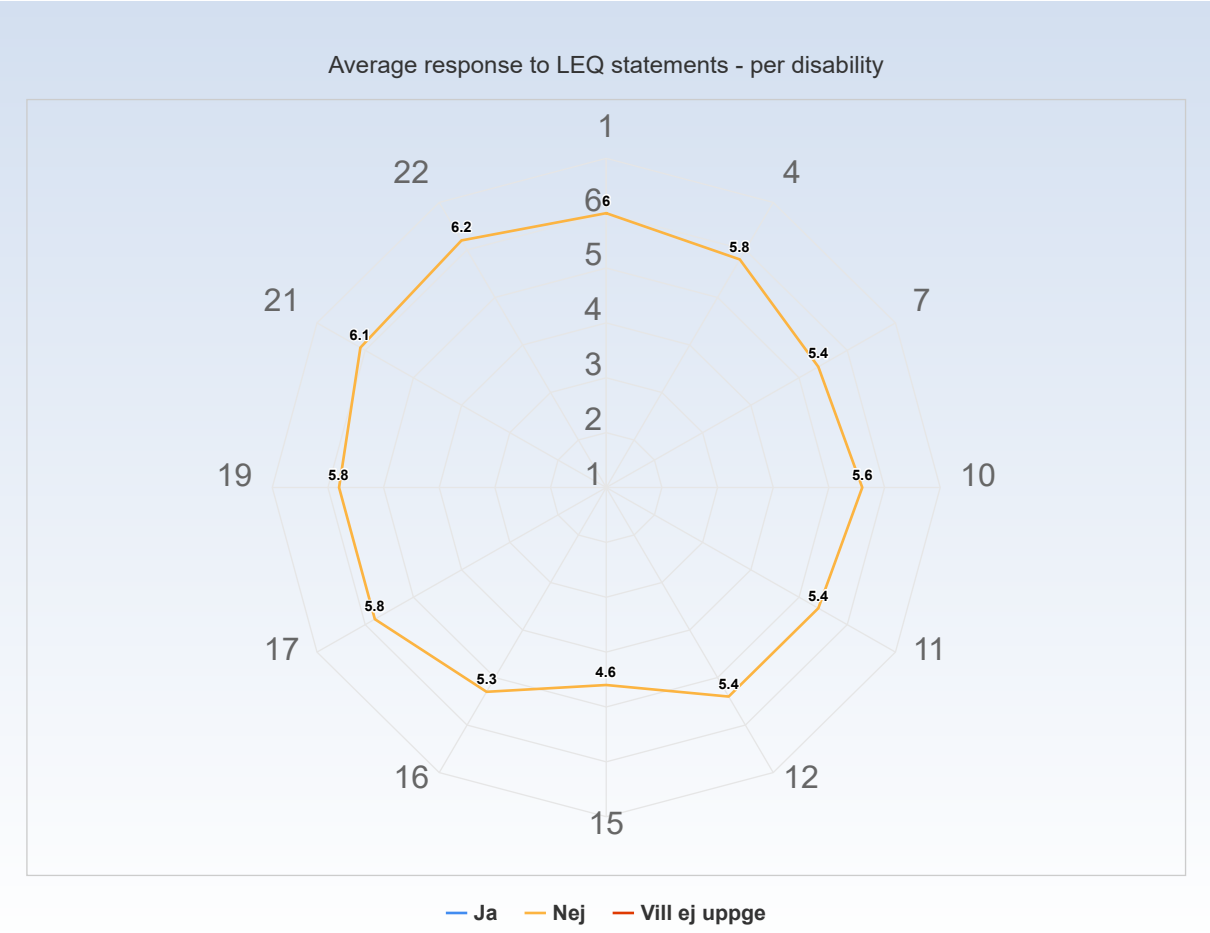
Comments

Comments (I am: Man)
Nothing to add



Comments

Comments (I am: Internationell utbytesstudent)
Nothing to add everything is in english



GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)
The projects were the part where I learned the most, especially the theoretical project.

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)
Lectures 10 and 11
The exercisesessions was absolutely the best part of the course. It was a good TA and we worked with relevant exercises. It was only after the exercises that I really understood the course material.

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)
TA was really good, good explanations

What was the best aspect of the course? (I worked: 18-20 timmar/vecka)
I really like the projects
And it was interesting to talk with the other groups at the end
Attempting to write our own solver was very interesting, even though it was hard to get completely right

What was the best aspect of the course? (I worked: 21-23 timmar/vecka)
I like the fact that the course was both theoretical and applied. It was nice to have exercise sessions to grasp the concepts of the course and to have the projects to discover in practice how optimization is used on real use cases. Even though I came to exercise sessions, I really appreciated to have access to the materials and corrections afterwards because I think they were really clear and well presented and it provided a good summary of the lectures which helped me grasp the general concepts.

What was the best aspect of the course? (I worked: 24-26 timmar/vecka)
Learned interesting things

What would you suggest to improve?

What would you suggest to improve? (I worked: 9-11 timmar/vecka)
The lectures were pretty terrible. The lecturer was fine, and given the circumstances it is understandable, but listening to someone reading off slides is an awful way to learn. I don't even think the lecturer had time to prepare properly for a lot of the lectures, which certainly did not help in understanding. Random groups in a graded project that affects your final grade will never be a good idea.

What would you suggest to improve? (I worked: 12-14 timmar/vecka)
More proofs + more theoretical details. Sometimes, results are just given, and this is not really helpful to understand well
I would really suggest to improve the lectures. The teacher could first and foremost be on time for the lectures and well prepared. Some lectures were embarrassingly bad... For one lecture that we had in Q he was 5 minutes late and was not able to present his lectures slided due to lack of projector. It also felt like he did not really know what was on the slides since he had to jump back and forth in his pp slides. Overall I think its a bad way to teach by only show pp slides and minimal examples on whiteboard. I would also suggest to improve the Canvas site, it was very difficult to find information regarding assignments and which group one belonged to.

What would you suggest to improve? (I worked: 15-17 timmar/vecka)
Slides not too full or show the content step for step

What would you suggest to improve? (I worked: 18-20 timmar/vecka)
As most of the time the course ended before the end it would be nixe to have 10 min at the beginning of the course to comeback on the main element of the last course (to underline better the key points and give more a an idea of the concepts)
I am very aware that the slides weren't yours, so please don't take this personally, but they were quite bad. Especially the first lectures about the optimality conditions had way to many text/formulas on every single slide and thus failed to convey the similarities and differences between the different cases. For example, it would be better to say "The SONOC are the FONOC _and_ this additional condition" rather than copying the whole set of conditions and leaving the students to search for the differences. Unfortunately, many later lectures suffer from too full slides too. In the linear course, the instructor mostly didn't use the slides but wrote down the relevant content on his tablet, maybe this could work for you too to make the class easier to follow?

What would you suggest to improve? (I worked: 21-23 timmar/vecka)
Maybe the material should be uploaded earlier even though personally I did not had time to read them before the classes. Also I think that the the project presentation was not so useful and it would be enough to peer review people who have worked on the same subject.

What would you suggest to improve? (I worked: 24-26 timmar/vecka)
Either stop with graded projects or stop with randomized groups. I would prefer the former since it powers the risk of screwing people over. Rather have a high pass level. Strongly recommend finding inspiration from sf2520 their course structure is perfect for this type course.

What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)
Make sure that you quickly assess how willing/ambitious/competent your group members are so that you understand how much time you will have to spend on the projects.

What advice would you like to give to future participants? (I worked: 12-14 timmar/vecka)
Try to read notes before lectures + complete the lectures with the Grisha
It can be good to take the Applied linear optimization course before this one.

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)
Participate in the exercise sessions Take time for the projects, choose one modelling one method

What advice would you like to give to future participants? (I worked: 18-20 timmar/vecka)
Work regularly each course Read the books (at least for the first courses)
Talk to your classmates and try to figure out how all the somewhat complicated formulas play together systematically. It looks daunting in the beginning, but isn't so bad after all.
Do old exams early

What advice would you like to give to future participants? (I worked: 21-23 timmar/vecka)
Work on a regular basis and train with old exams for the final exam.

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)
Sometimes, lectures are just like "read the slides". It could be really helpful to do some proofs on a blackboard + more details

Is there anything else you would like to add? (I worked: 18-20 timmar/vecka)
Thanks
It was a really well done course, despite the organizational difficulties in the beginning. Thank you!

Is there anything else you would like to add? (I worked: 21-23 timmar/vecka)
Thank you for the class, it was well organized and interesting :)

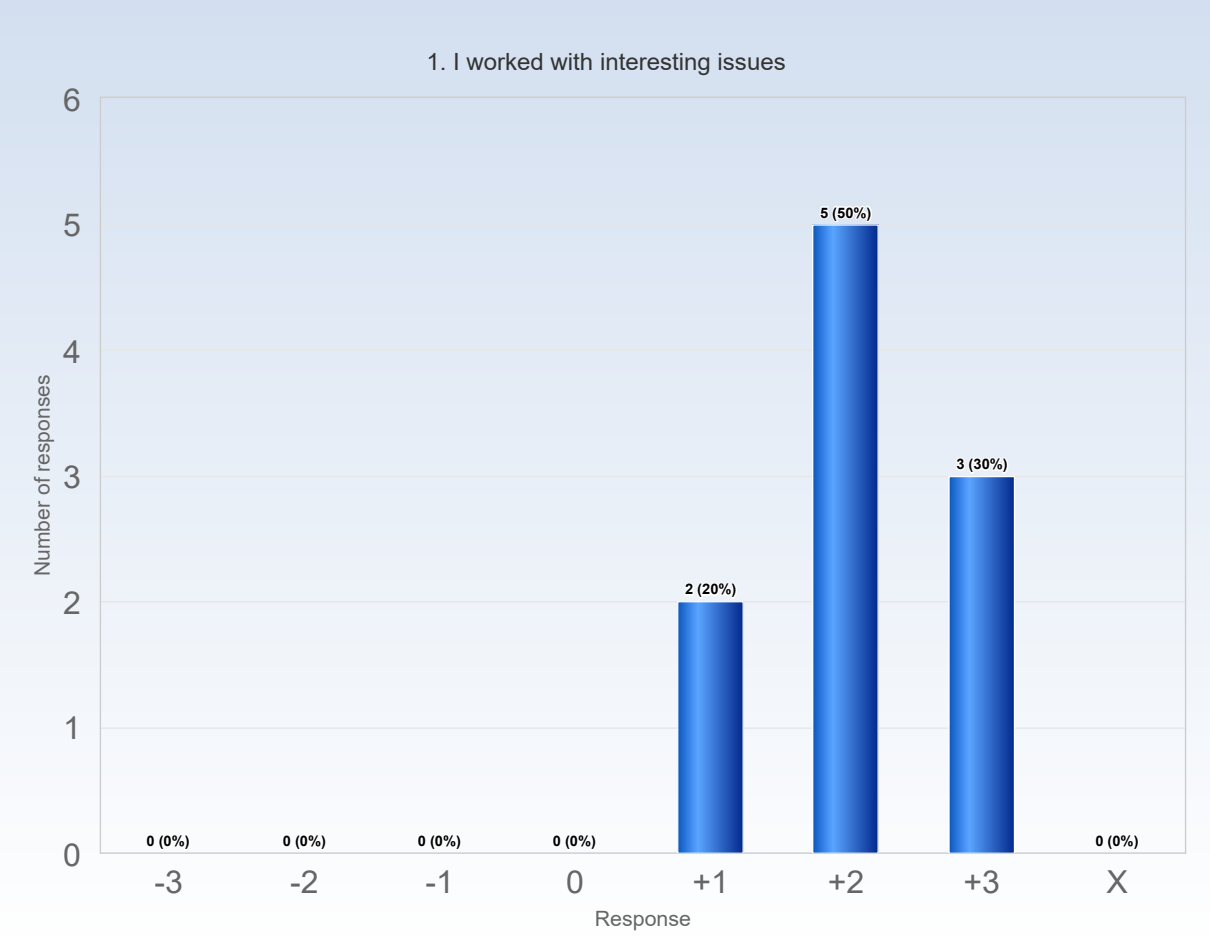
SPECIFIC QUESTIONS

RESPONSE DATA

The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

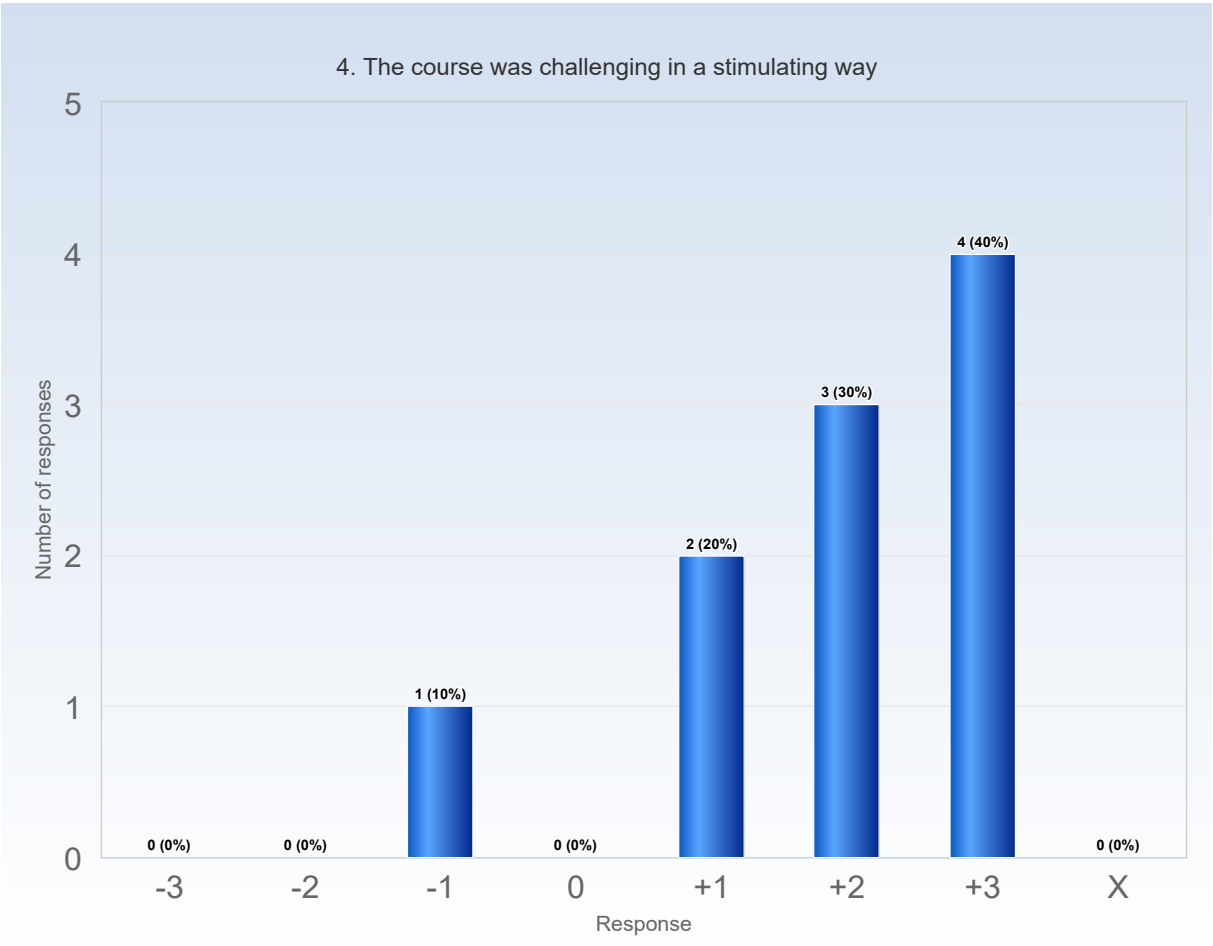
-3 = No, I strongly disagree with the statement
0 = I am neutral to the statement
+3 = Yes, I strongly agree with the statement

X = I decline to take a position on the statement



Comments

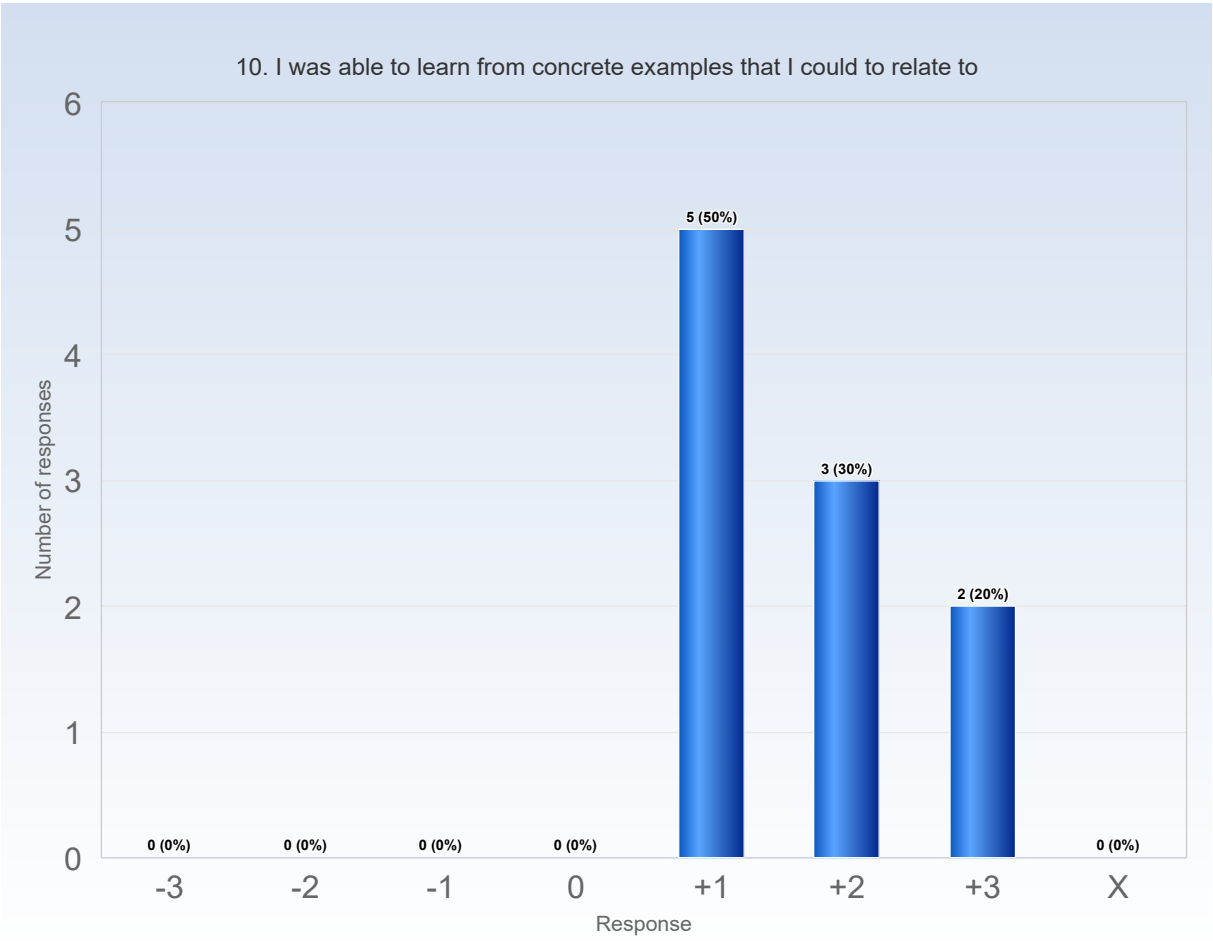
Comments (My response was: +2)
Could be awesome to have more theme projects (particularly for project 1)



Comments

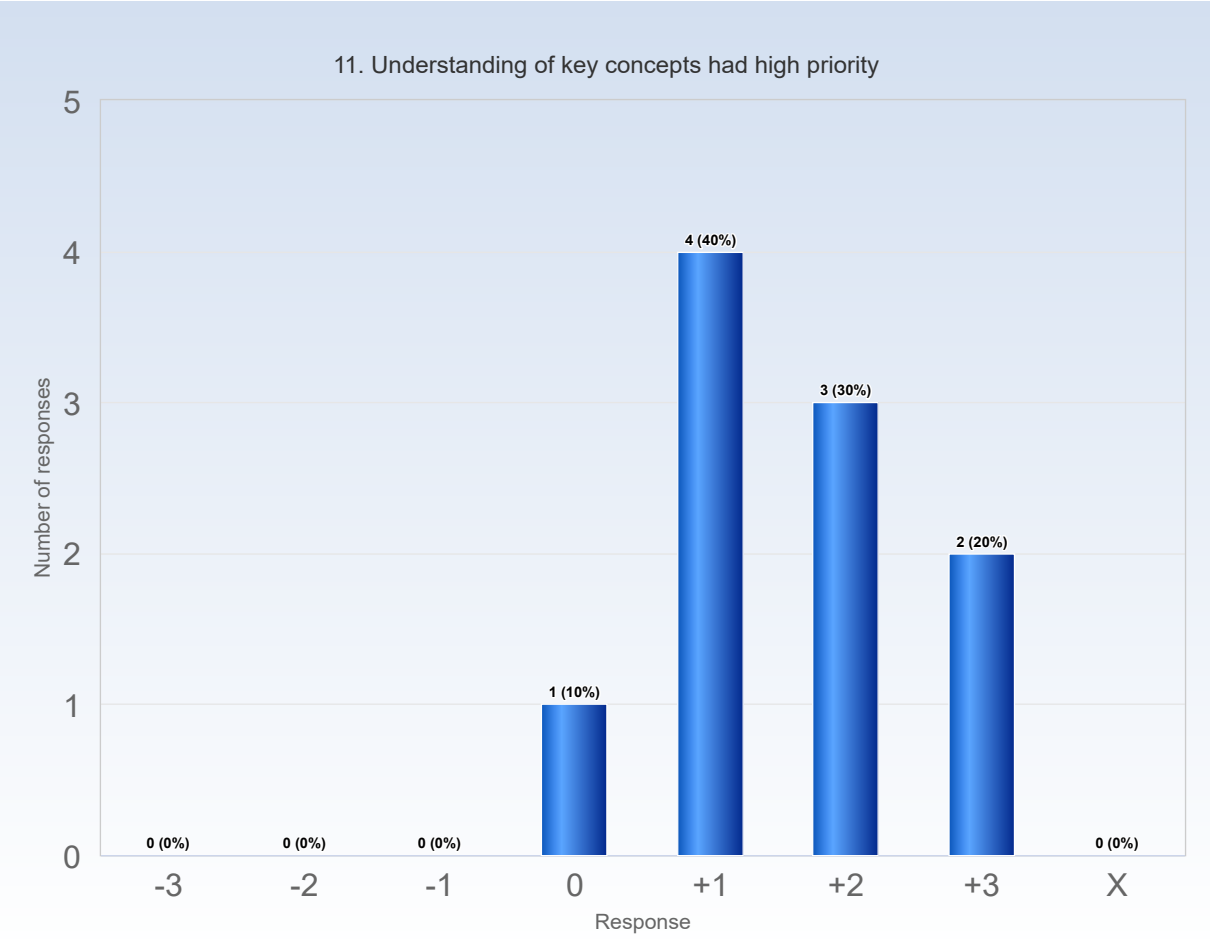
Comments (My response was: +1)
To applied sometimes in my opinion, but the expected goal is achieved. Exercises are too applied so it is sometimes too much computations


7. The intended learning outcomes helped me to understand what I was expected to achieve
Number of responses
3.5
3
2.5
2
1.5
1
0.5
0
0 (0%)
0 (0%)
2 (20%)
1 (10%)
2 (20%)
2 (20%)
3 (30%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response



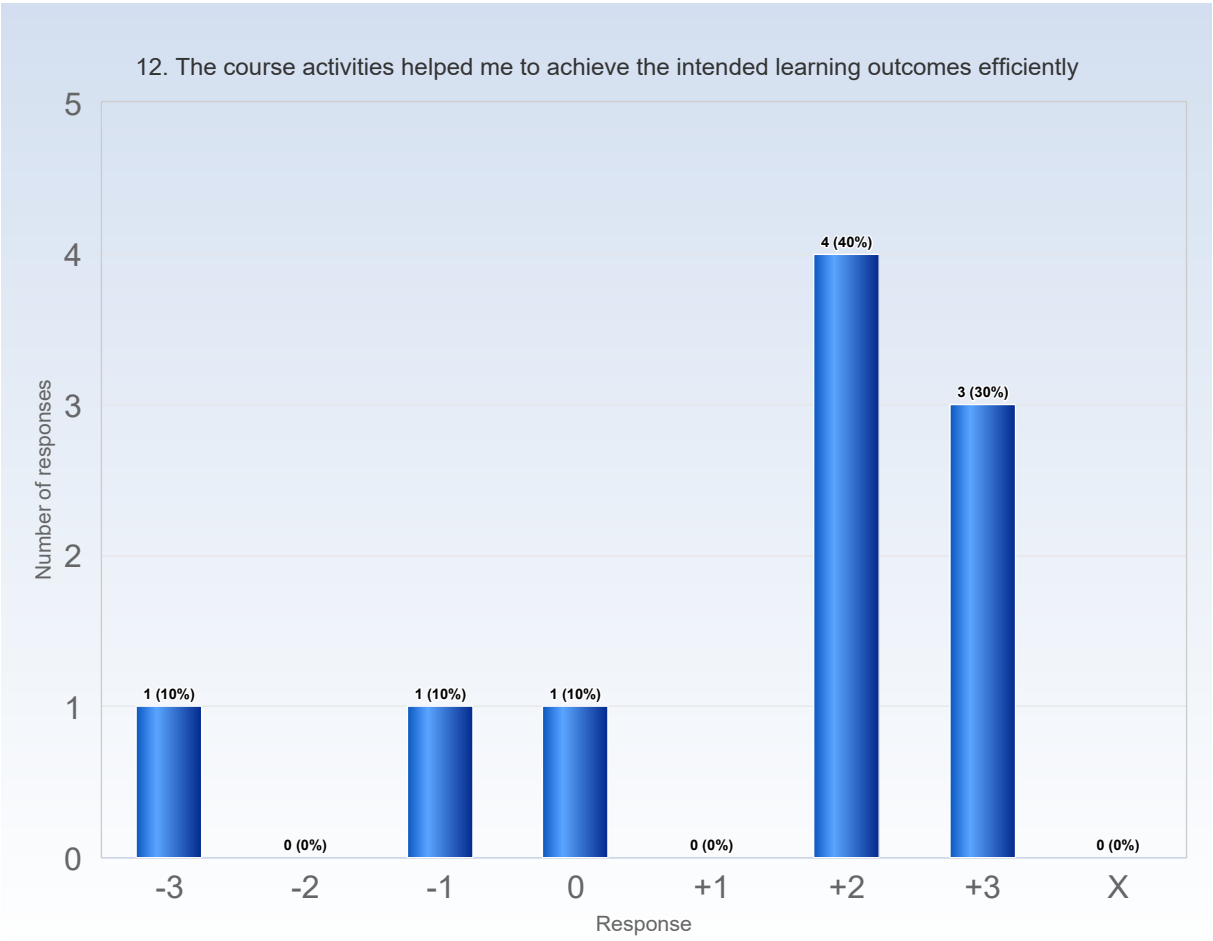
Comments

Comments (My response was: +1)
it would be better to had more example in the first courses (theory courses)
Theme of project 1 was to far away from my experience

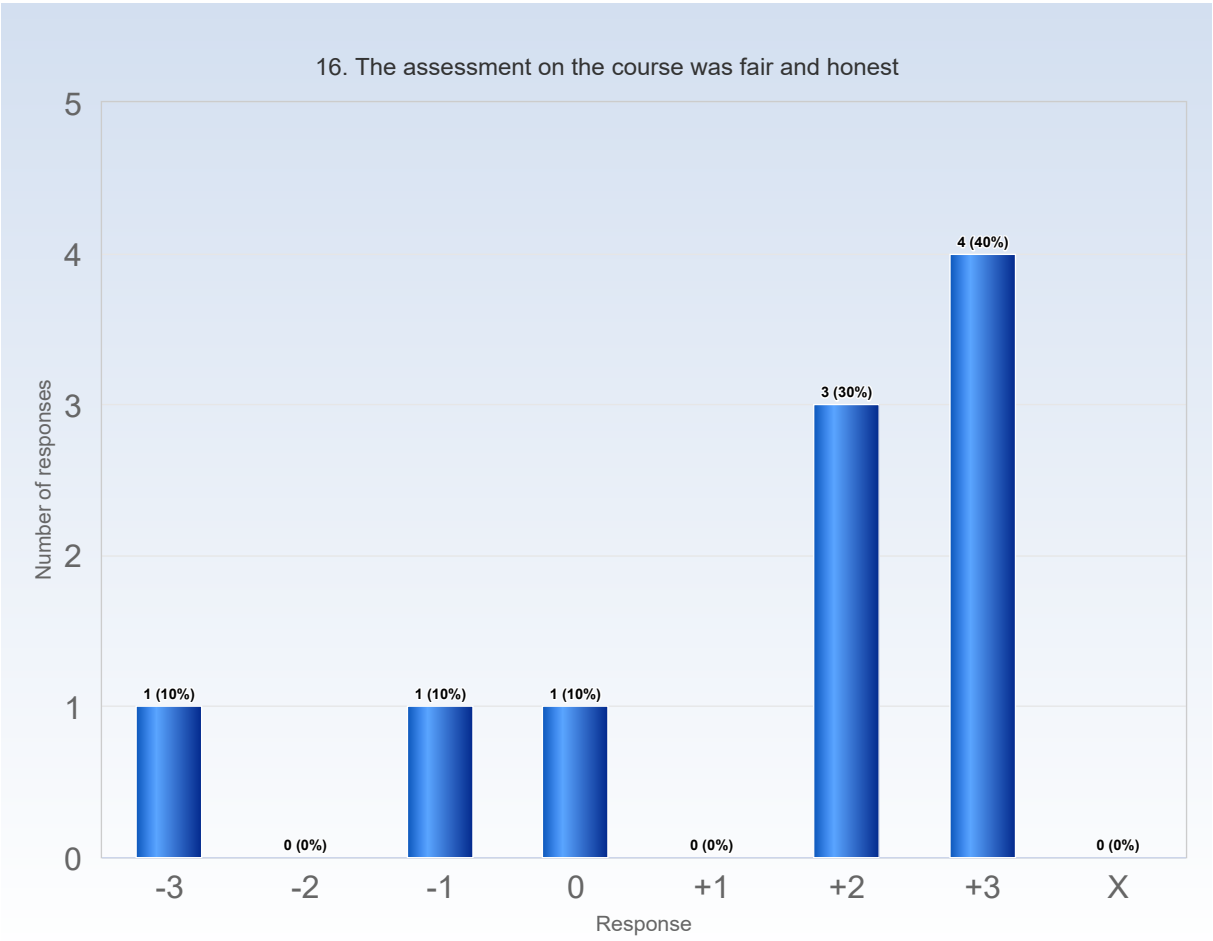


Comments

Comments (My response was: +1)
It could be made clearer which are the key concepts and which are just nice to know


12. The course activities helped me to achieve the intended learning outcomes efficiently
Number of responses
5
4
3
2
1
0
1 (10%)
0 (0%)
1 (10%)
1 (10%)
0 (0%)
4 (40%)
3 (30%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response


15. I was able to practice and receive feedback without being graded
Number of responses
3.5
3
2.5
2
1.5
1
0.5
0
0 (0%)
1 (10%)
1 (10%)
2 (20%)
3 (30%)
2 (20%)
1 (10%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response

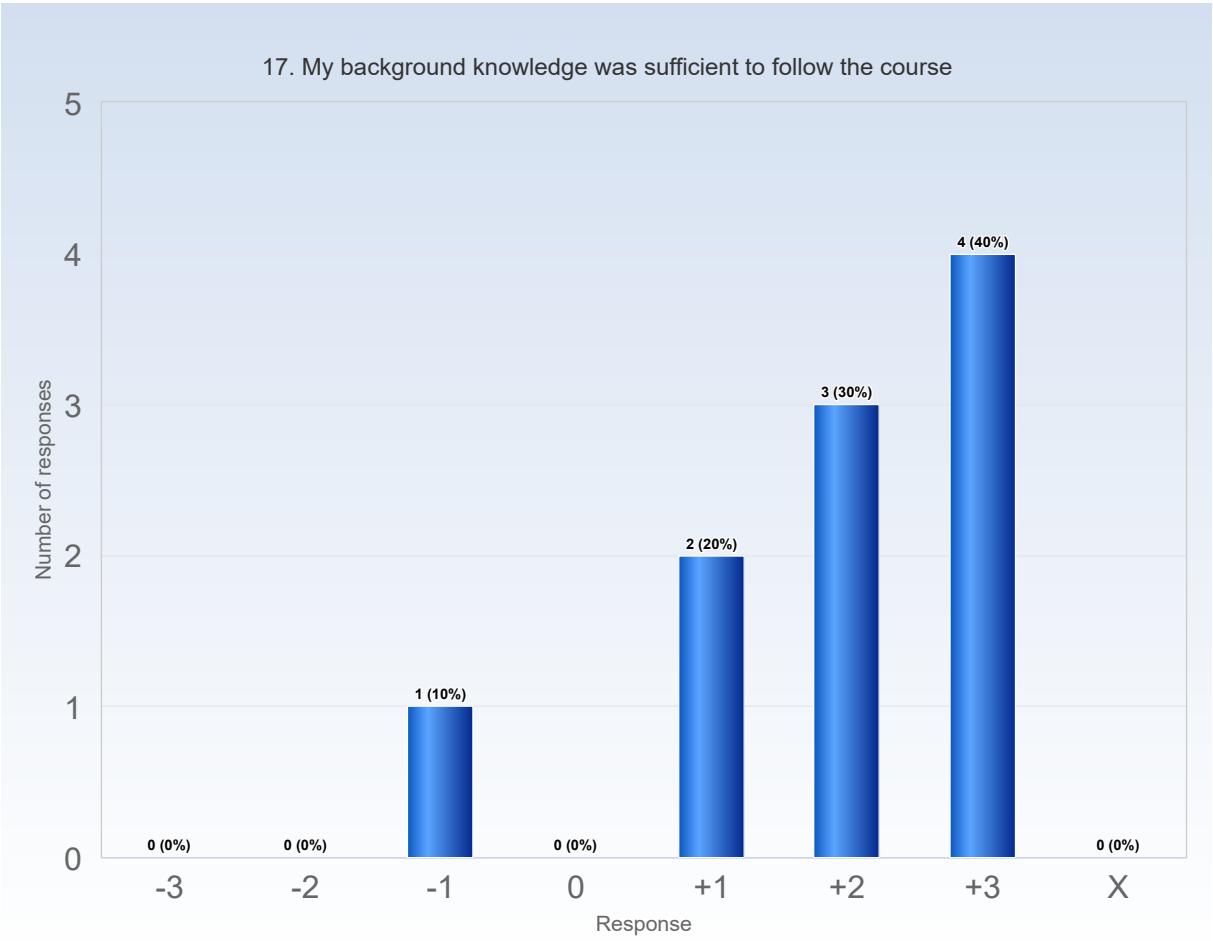


Comments

Comments (My response was: -1)
Graded group projects are always horrible. It's even worse with randomized groups

Comments (My response was: 0)
Grading on projects was not justified, girls got rather A then boys

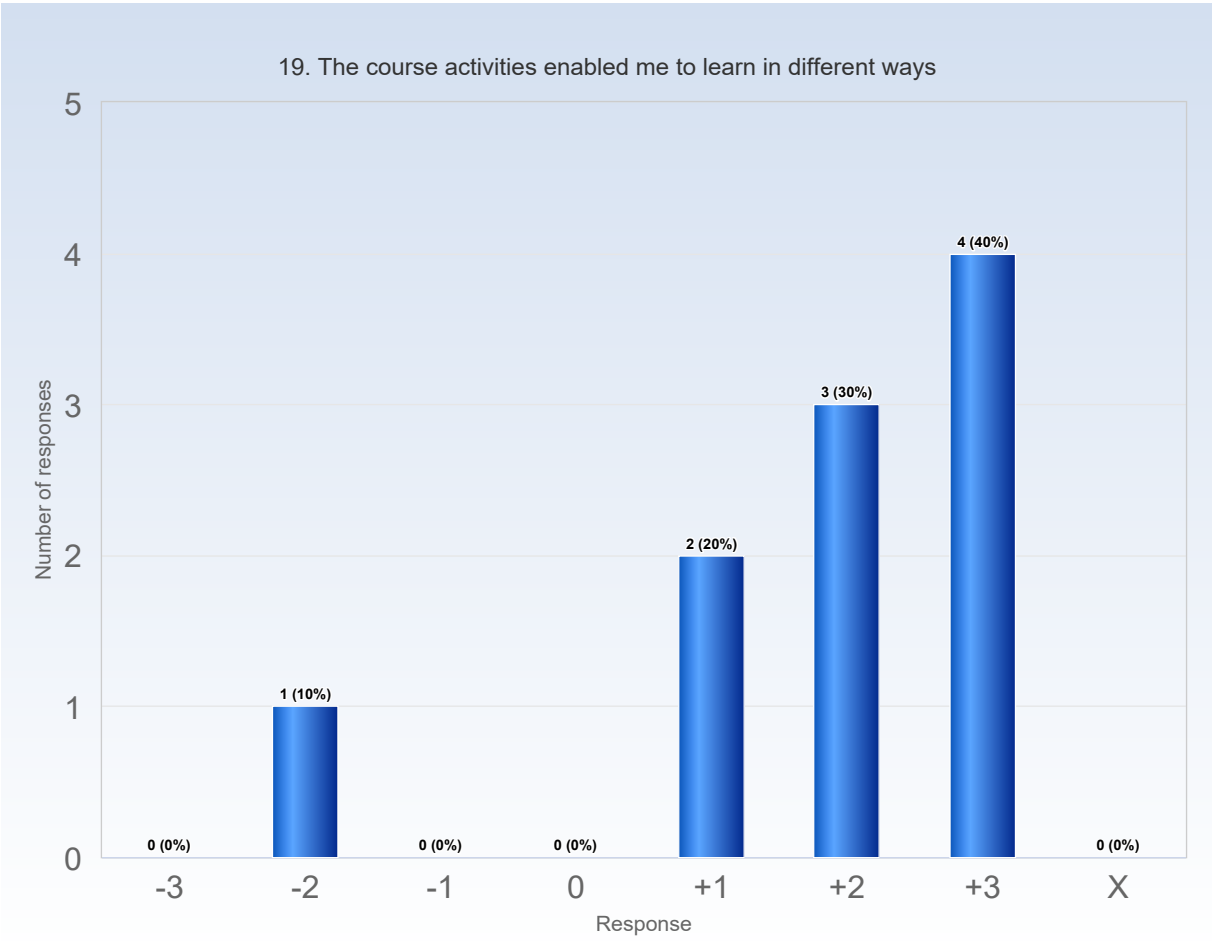
Comments (My response was: +2)
More details would be cool

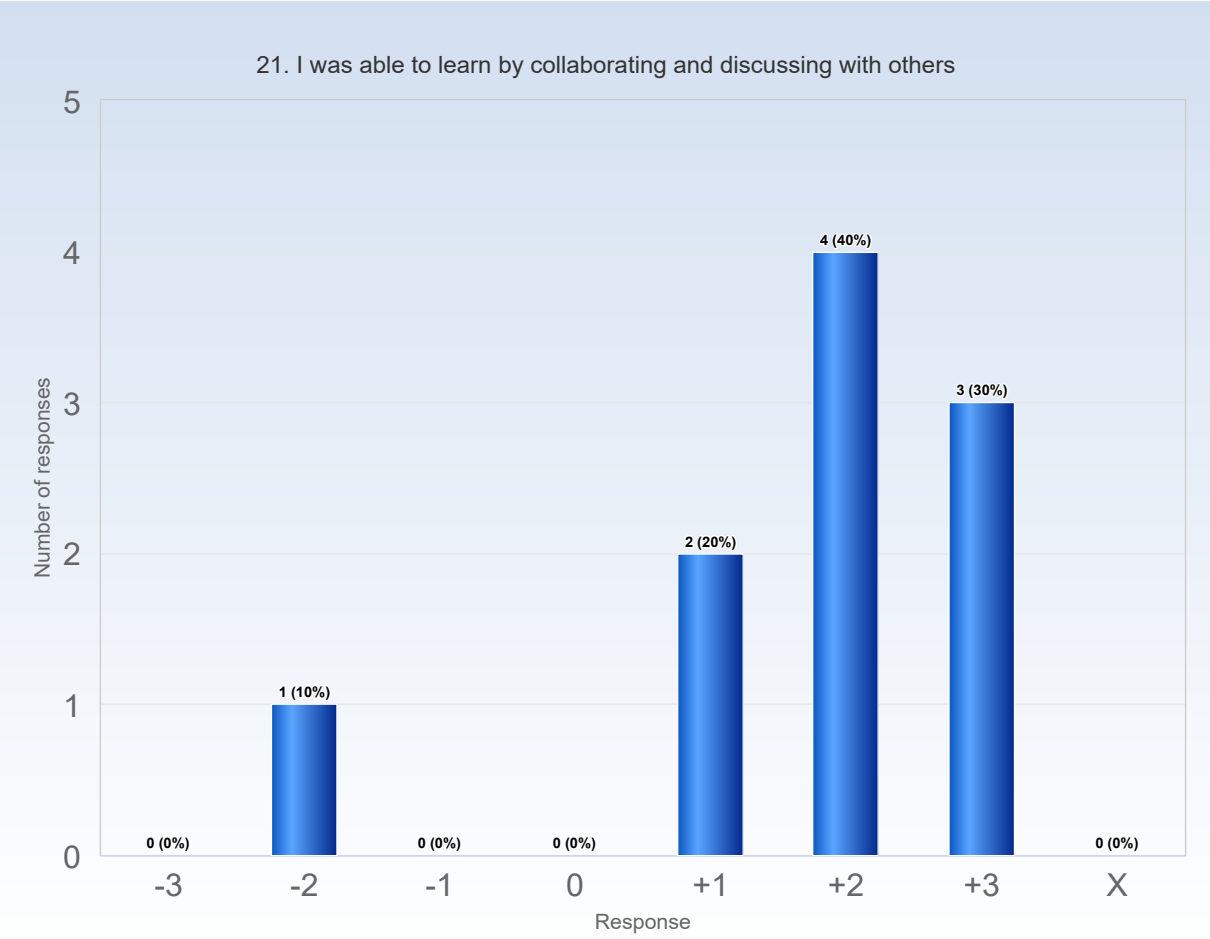


Comments

Comments (My response was: +1)
a bit hard at the beginning

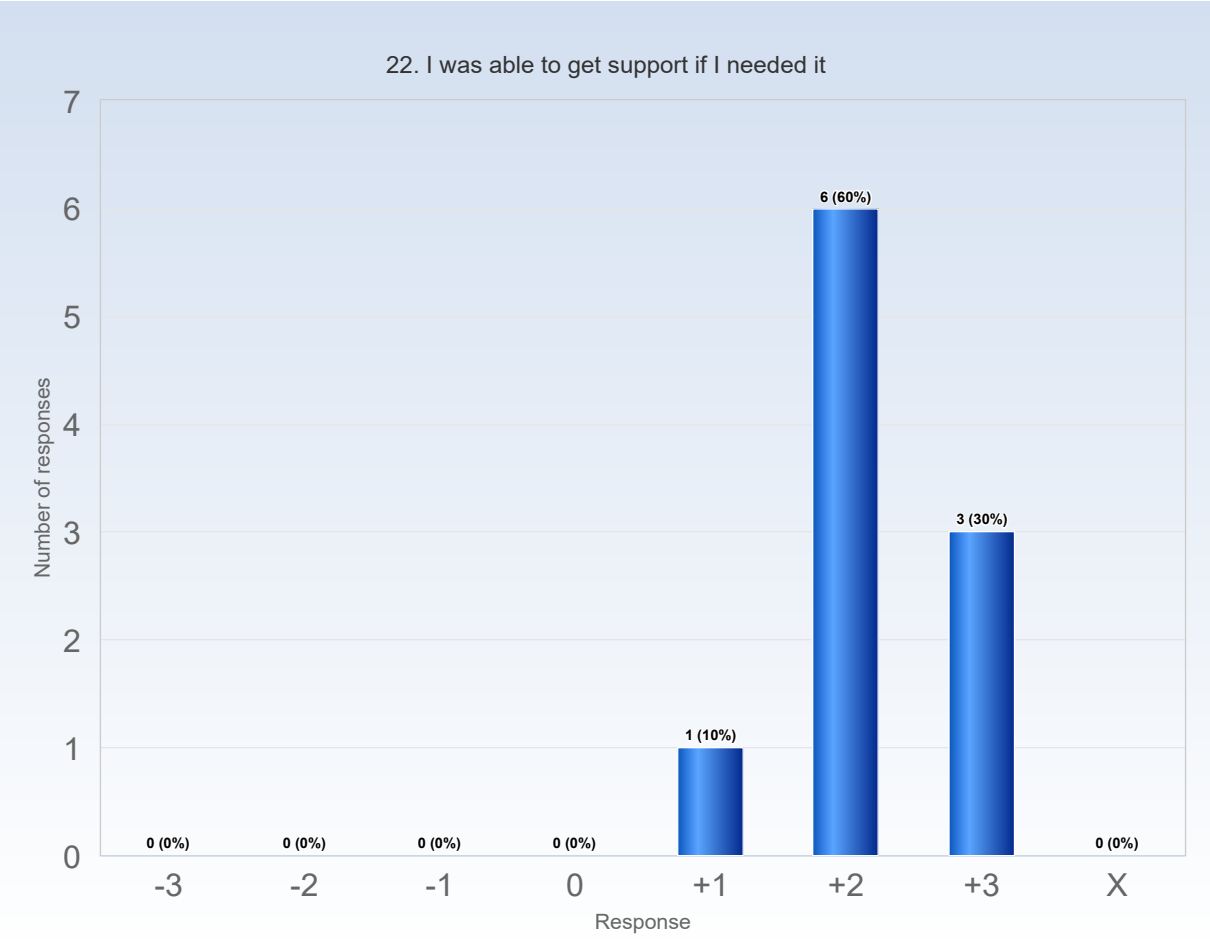
Comments (My response was: +2)
A bigger recap about Applied linear optimization


19. The course activities enabled me to learn in different ways
Number of responses
5
4
3
2
1
0
0 (0%)
1 (10%)
0 (0%)
0 (0%)
2 (20%)
3 (30%)
4 (40%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response



Comments

Comments (My response was: +3)
Teamwork makes the dream work



Comments

Comments (My response was: +2)
Sometimes explanations ware not enough clear