Report - SG2212 - 2020-06-09

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):

Philipp Schlatter, pschlatt@mech.kth.se, Ardeshir Hanifi, hanifi@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.

The LEQ form was sent to all students after the end of the lectures shortly before the exam with the possibility to answer also after the exam. All students had the choice to answer online, with reminders from the system.

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.)

There were no scheduled meetings with students, but of course occasional discussions during the break and after lectures.

COURSE DESIGN

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

The course consists of lectures sessions (25x2 h total, approximately 3x2 to 4x2 hours per week), one exercise session (1h per week), 6 homeworks, and a project (approx. 10 h) at the end. Learning questions are given to the students which cover the topics that are tested at the written (closed-book) exam (focusing on theory), whereas the practical skills are trained via the homeworks and the project. The homeworks and the project give bonus points for the exam (max. 10 out of 60), and a certain minimum is required for getting the credits for the LAB1 part of the course.

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?

The students say that they use quite a significant amount of time for the course, up to 30h per week (one student even more than 40 h). However, the average is around 20h per week. Subtracting on average 6 hours for the actual lectures give around 14 hours of self-study and homeworks. A course at 7.5 credits would require 200 hours of work. The course is about 8 weeks long, which gives an average required work of 25 hours per week. The averaged work load reported by the students is slightly below that. However, the students feel that the load work is high, mostly due to the work required for the assignments. Despite this, the students seem to appreciate the assignments and their variety, reflecting different subjects taught during the course.

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 are similar to those from previous years and are reasonable. Of those who followed the course, about 25% received grade A, 11% grade B, 19% grade C, 33% grade D, 4% grade E and 8% grade F. The statistics is based on the exam with 27 participants.

STUDENTS´ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

In general, the student mention that the course is valuable for their education, that the lectures and exercises are in general well organised and useful, but that there is some time requirements. Overall, one can state that the students are happy with course and and skills they acquire.

SUMMARY OF STUDENTS' OPINIONS

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

The answers are quite consistent. They were in general positive to the lectures, the lecturers, the structure and the content.
As previous years, students found the course demanding and time consuming, which is correct. However, despite the fact that the assignments have been time-consuming they are appreciated and found by students to be meaningful.
The students also realise the need for continuous study during the course, which is reflected in their advices to the future students.
The students have quite different opinion about the pace of the course, from normal to very fast. This different experience can be due to their different background.
It seems some part of course is considered by students to require memorizing rather than understanding the topic. This is something that we intend to work on, in particular with alternative examination for 2021.
Some students note that in certain parts of the course mainly the lecture notes with all derivations are written on the board, which is not useful. This is true to some extent and should be improved in next rounds of the course.
Apart from that, no major critisism is raised.

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 students' answers reflect also the views of the teachers. We have implemented a number of changes throughout the years to address the comments, and we believe that we have arrived at a good balance between workload (7.5 credits), content, depth of discussion, and also a more practical part (OpenFOAM and project). The examination is indeed one outstanding issue which we tackle in the future.

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?

nothing specific related to different student groups.

PRIORITIZED COURSE DEVELOPMENT

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

We will work on improving description of assignments and exercise sessions.
There are no books that covers all part of the course. Therefore, we have been using a compendium which we have continuously improved it, this work will continue and material can be modified. The script for the first part of the course has now matured that very few typos are still remaining, and that all the material is covered.
We have also had for the first time a scheduled OpenFOAM demonstration (2h), which was assessed favourably by the students.

Improved alterantive examination forms are planned for 2021, in order to address the comments by the students.

OTHER INFORMATION

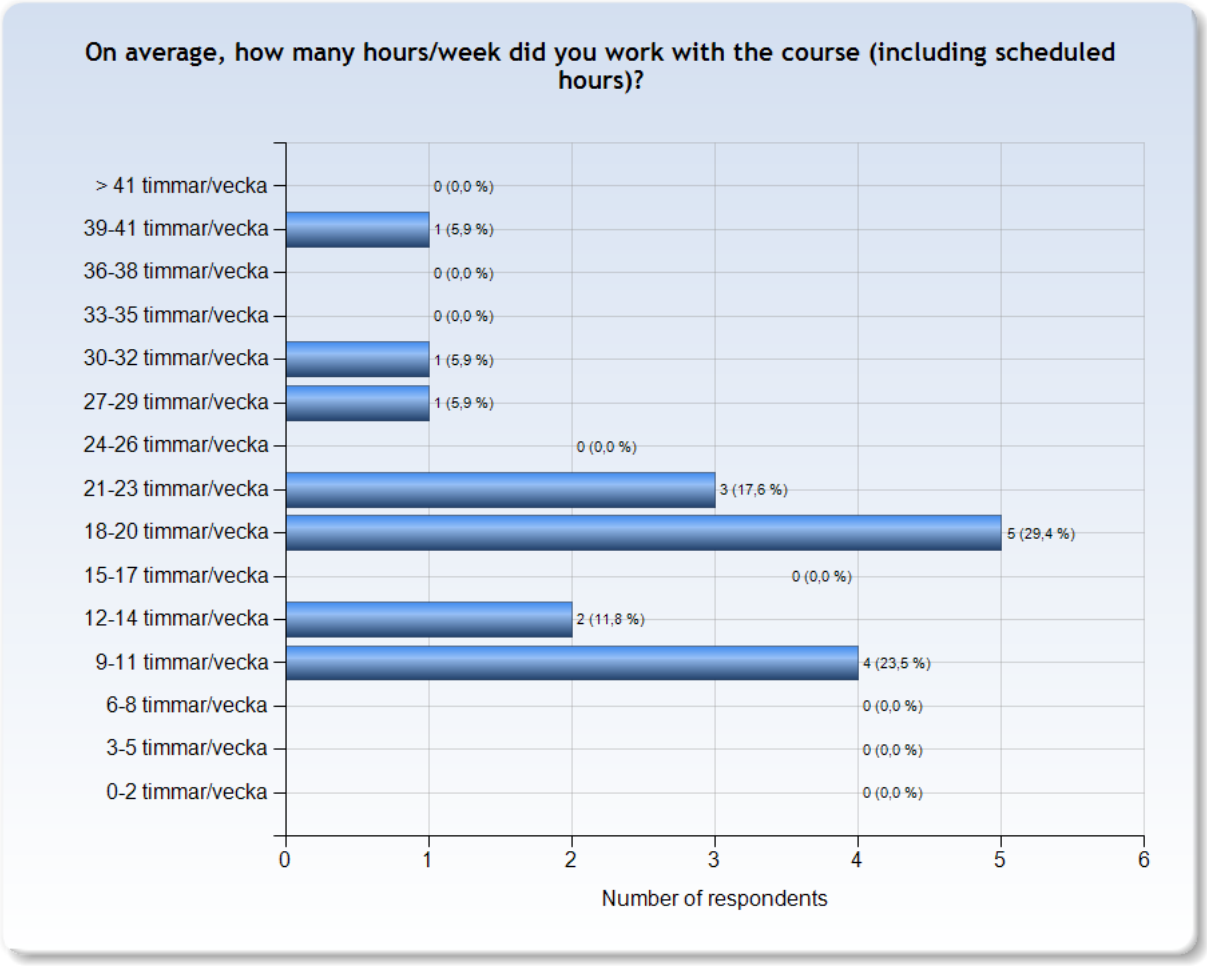
Is there anything else you would like to add?

Approximately 50% of the students answered, which is quite good compare to other courses. In the most of cases the feedback is consistent providing a good picture of students experience.
It should be mentioned that about 12 hours in the beginning of the course are dedicated to introductory fluid mechanics and numerical analysis. This has been necessary to make sure that all students which have different backgrounds learn the basic knowledge required for the course.

SG2212 - 2020-03-01

Antal respondenter: 34
Antal svar: 17
Svarsfrekvens: 50,00 %

ESTIMATED WORKLOAD



Comments

Comments (I worked: 9-11 timmar/vecka)
The homework took a large chunk. It was more like learning by doing. I appreciate the course in this aspect.
It is very good. I have used simulation software to solve my problem. Sometime I didn't understand why I have to chose this function, this method etc. However, I got a lot of knowledge from you and I can adapt it in own work. Thank you

Comments (I worked: 12-14 timmar/vecka)
the workload for the homework is too much compared to their effective influence on final grade
The workload basically comes from home work. I think it's a bit too much for me, especially couple last homework assignments. Back-to-back homework is also a bit too stressful.

Comments (I worked: 18-20 timmar/vecka)
Workload is ok
Homework for every week took majority of my free time. I have to say that it wasn't useless and I have learnt a lot on these homework, but it was too time consuming work for me, as I didn't have previous experience with CFD. I enjoyed more numerical part of the course. Last part of the course was most of the time more difficult to follow for me, but I was still interested in the topic.
The homework is very time consuming

Comments (I worked: 21-23 timmar/vecka)
A lot of work per week, interesting topic. In my opinion to much work for the homeworks in comparison to their counting in the final grade.
I would say it was a time consuming course, in respect to the others I had at KTH
The course required a large effort during the lecture period, but is was useful to better understand the subject. However, I am attending master degree in aerospace engineering, aeronautics track and I hade 15 credits of mandatory courses in this period. Thus, I was not able to give the exam at the first call and following 22,5 credits in total was really hard and finally I am not 100% satisfied of the results I got from all the courses. Since aeronautics is strictly related to CFD and aerodynamics in general, I would suggest to make the courses plan for my master program a little bit better planned, to allow students to attend this course in this 3rd period.

Comments (I worked: 27-29 timmar/vecka)
A bit too much imo. The course is supposed to be half time. Have not had time to study for the exam in advance of the exam period.

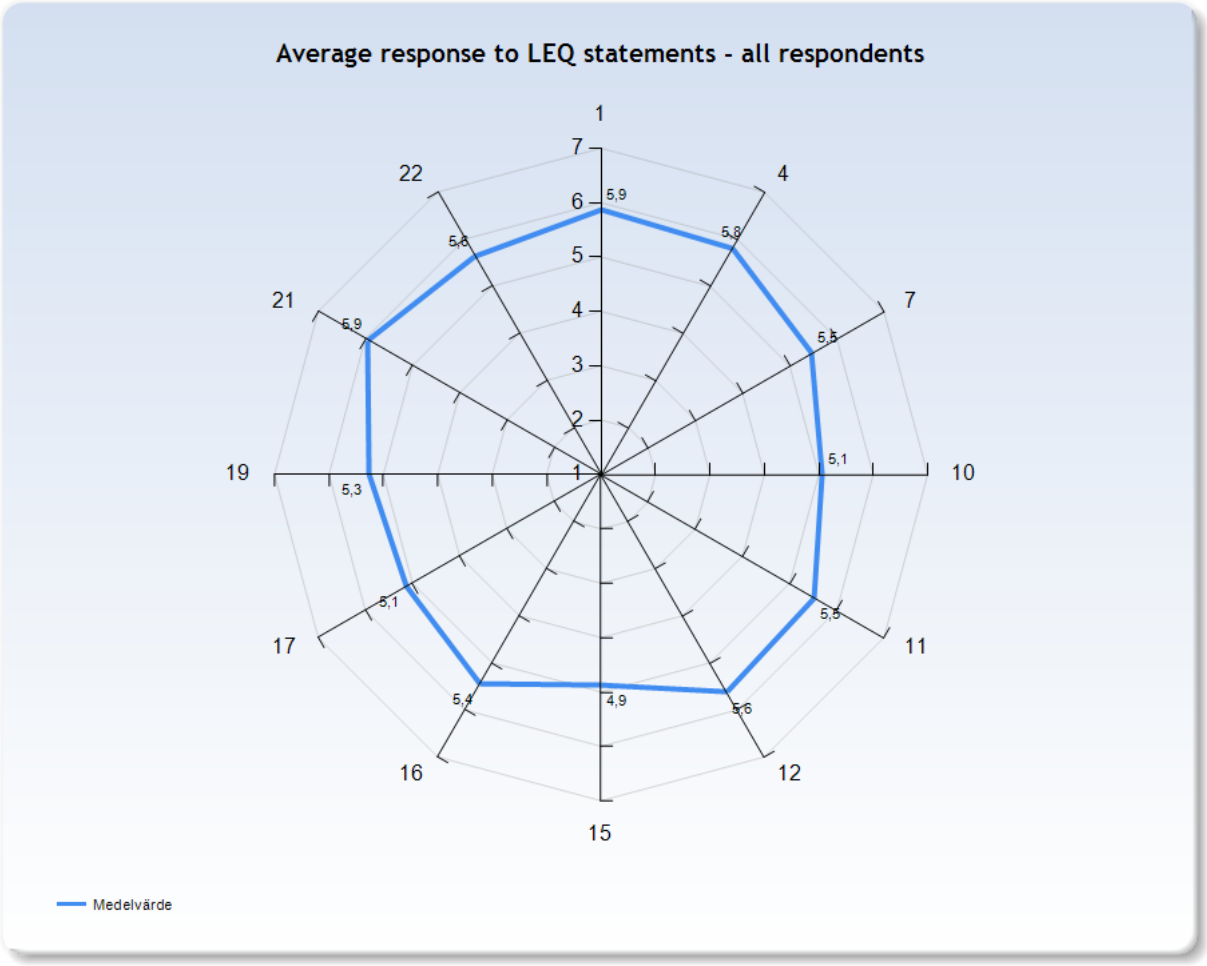
Comments (I worked: 30-32 timmar/vecka)
This course requires significantly more work than what is supposed to, in terms of credits.

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

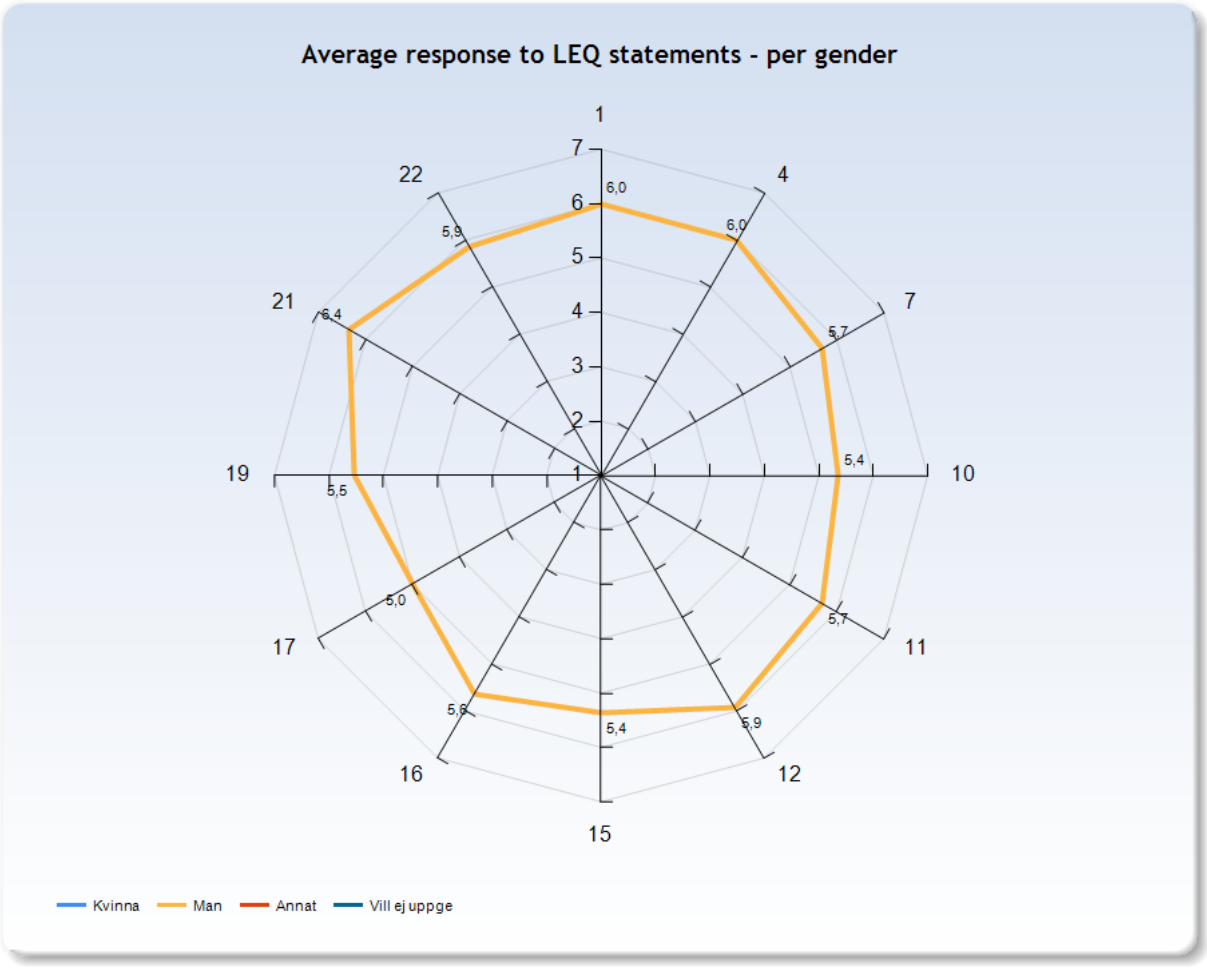
Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

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.

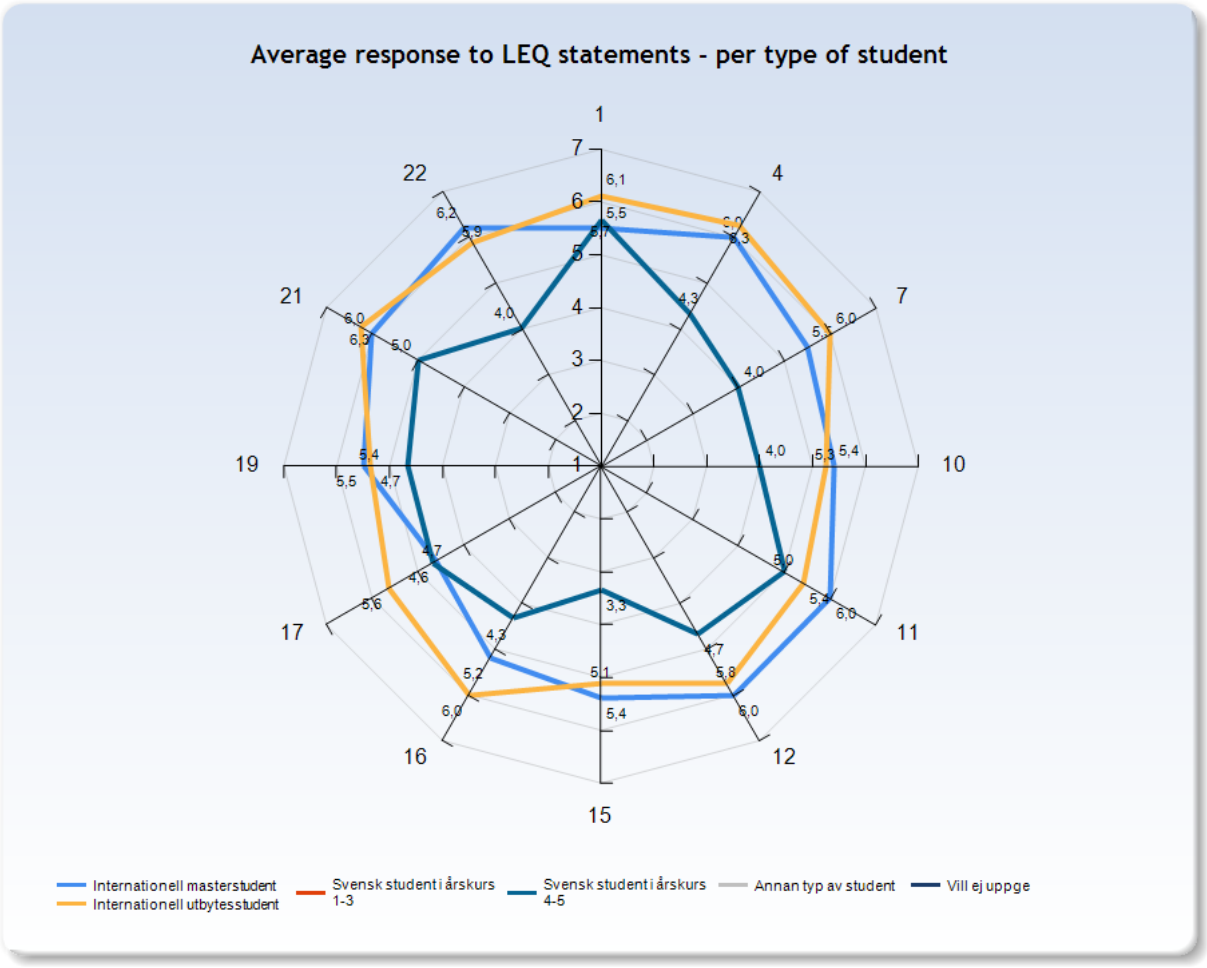
Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.



Comments

Comments (I am: Kvinna)
I didn't feel any gender differences in this course.

Comments (I am: Man)
No comments
My sex/gender is completely irrelevant to the course.
Exchange student

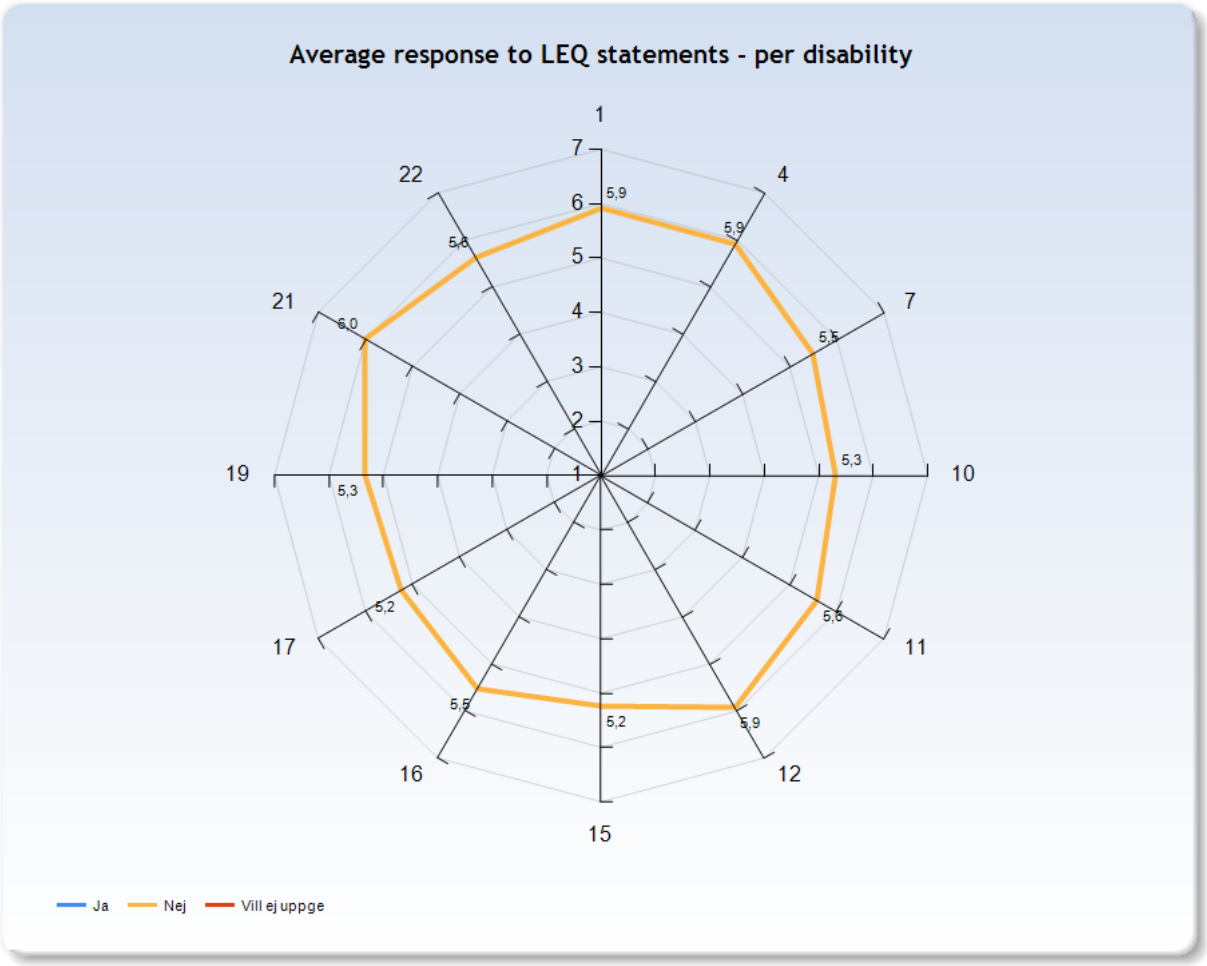


Comments

Comments (I am: Internationell masterstudent)
I sometimes had the feeling that the course was more adressing to PHD students than master

Comments (I am: Internationell utbytesstudent)
I was lucky that I coded before already
I didn't know people to cooperate with at the beginning of the course. English as foreign language didn't make the things easier. I was forced to make new friends and find some contacts for homework groups. Still I was working mostly alone from the beginning and it was much more difficult for me.

Comments (I am: Svensk student i årskurs 4-5)
I feel like my program, despite recommending this course, didn't prepare me for some of the topics in this course, which is a shame.


Average response to LEQ statements - per disability
1
4
7
10
11
12
15
16
17
19
21
22
7
6
5
4
3
2
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5,9
5,9
5,5
5,3
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5,2
5,5
5,2
5,3
6,0
5,6
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Comments

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)
Basic knowledge about CFD

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)
the implementation of the theory studied in the homework
Self-learning

What was the best aspect of the course? (I worked: 18-20 timmar/vecka)
Working in groups was really productive. Also, we constantly practiced the theory through the homework. Thus we could easily visualize the concepts taught.
Possibility to work in groups together to solve the homework, Mr Philpps style of presenting the topic, he shared his way of thinking of CFD Problems while presenting. The good and complete lecture notes.
Running the code for the project and actually see a solution for NSE
I really enjoyed the numerical part of the course. It was presented in interesting way and the lectures wasn't only exact following of the exact notes as in the fluid dynamics part. On the other hand I appreciate handling of the lecture notes in high quality.
I am very satisfied with the lectures in this course. Both teachers came prepared and showed interest in the subject. The home assignments were interesting and I like that we get a comment on what is incorrect.

What was the best aspect of the course? (I worked: 21-23 timmar/vecka)
Phillip is a great teacher! He really knows how to express his thoughts.
Really good course material (pdf handouts)
The weekly assignment work is very useful for a better understanding of the subject.

What was the best aspect of the course? (I worked: 30-32 timmar/vecka)
It allowed us to apply the theory, which I appreciated.

What was the best aspect of the course? (I worked: 39-41 timmar/vecka)
Basic numerics part of the course.

What would you suggest to improve?

What would you suggest to improve? (I worked: 9-11 timmar/vecka)
The grading scale can be a bit relaxed. Sometimes, a bit demotivated looking at the numbers to get a good grade. Also, I personally feel the exam is memory based - like derivations etc., Maybe, an oral exam can be helpful focusing on understanding of concepts as well.
I think it has less example

What would you suggest to improve? (I worked: 12-14 timmar/vecka)
more practical parts also in lectures (e.g. simulations and projects developed in class) and some practice with commercial programms
I would suggest to reduce workload of the homework assignments. They took more time than I thought. Event hough, HW is not compulsory, but I still would like to reduce the amount of workload. There should be lab session for HW and project just in case we get stuck anywhere so that we could ask for help directly.

What would you suggest to improve? (I worked: 18-20 timmar/vecka)
Better correspondence between theory and homework. Some things n the homeworks were never handled in class. The homework also requires workload far superior to the credit it is responsible for. Such interaction with the course should offer students more “reward” about their final grade. Finally, I felt that the fluid part was really secondary in the course and needed a bit more emphasis against the numerics part.
A better intergration of the homework into the lectures, e.g. presenting the solution at the corresponding point in the script. A stronger connection between Fluid dynamics part and Numerics part in the lecture notes and in lectures. The homework presentation was depending on the tutor too fast and more a monologue then a homework discussion. A increased value for the homework in comparison to the exam bof time amount. Maybe a prepared presentation with key steps of solving would be better, especially to get a Master solution for asked definitions. Eliminating the handwritten parts out of the script and unify both parts. A higher CP number, in comparison with my other course of 7,5 CPs I’m doing the double.
one Overall skript (do not upload 20 different lecture notes from 3 different years...)
As I said, a lectures from fluid dynamic part would be more interesting for me if it be said in a little bit different way than exact following of the lecture notes. For me it is better to hear or read the same thing in different words. Also homework were for me difficult and time consuming, but this is maybe only my personal problem that I didn't have previous experience with CFD.
Most of the time they only talked about the final result but it would be better to also talked about how you got there. Show the steps. Also! I think it would be very good if you could add a räknestuga(question session) where we can work on the home assignment and ask the TA in class because sending an email isn't always very helpful. I think it is annoying and disrespectful to make the course go beyond the exam period. Maybe have less home assignments and have the project start sooner. Because most students start new courses and don't want to be still working on old courses or have the time for it without falling behind on new courses.

What would you suggest to improve? (I worked: 21-23 timmar/vecka)
better teaching skills for the other teachers besides Phillip. higher rating of the homeworks for the final grade
There was no fluid dynamics at all in the exam, and it has a really low importance in this course.
Sometimes I had to handle with assignments arguments which had not been explained yet. Maybe an overview lecture on how to perform the assignment would be better than the correction (the correction could be updated after the deadline)

What would you suggest to improve? (I worked: 27-29 timmar/vecka)
The dates for when homeworks are handed out were much too close to their deadlines. We got a few of them late in the week (Friday or Saturday), with deadline on Wednesday. This meant that one could not work ahead but had to spend the first half of each week just working on HWs.

What would you suggest to improve? (I worked: 30-32 timmar/vecka)
Less time consuming home assignments with a broader range of topics covered in them.

What would you suggest to improve? (I worked: 39-41 timmar/vecka)
Less homeworks so that one can begin working on the project earlier because as new courses begin in P4, it will be very challenging to finish the project and keep up with other courses. Some homeworks needed some better pretutoring, for example homework 5. The theoretical part of the course which doesnt include Basic Numerics, Fluid dynamics need much improvement to become pedagogical. Very hard to understand the concepts and be able to derive the different topics just from the notes. Here some extra resources or links could become available to help understand difficult concepts. It would be great if there would be some earlier exams available on canvas so that one can get a feeling how the exams are structured. No solutions necessary. Like how many questions are normally from the basic numerics and how many from the other part.

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)
Seriously work on the assignments to improve your understanding.
Please take more example

What advice would you like to give to future participants? (I worked: 12-14 timmar/vecka)
Revise your knowledge about partial differential equation and numerical method. MATLAB programming is necessary for the HW.

What advice would you like to give to future participants? (I worked: 18-20 timmar/vecka)
Start studying from the beginning so that you don't fall behind.
Be prepared for an intense course experience, try to solve the study questions during the quarter.
Do the homeworks
It's good to know at least basics in Matlab. Also I think it's better to do homework for every weak even if the deadline is few weeks after exam. I could find a lot of answers for study questions there.

What advice would you like to give to future participants? (I worked: 21-23 timmar/vecka)
Do not waste time on understanding perfectly fluid dynamics
Daily work

What advice would you like to give to future participants? (I worked: 30-32 timmar/vecka)
Work on the study questions continuously as you progress through the course!

What advice would you like to give to future participants? (I worked: 39-41 timmar/vecka)
Answer the study questions as early as possible. Work together with others.

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 9-11 timmar/vecka)
Additional OpenFOAM session can be added. Maybe an optional ungraded section on - Additional tasks etc., can be added to those interested.

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)
I don't understand the point of giving the derivation problems in the study questions and also in the exam! Since most of the time is remembering not truly understanding.

Is there anything else you would like to add? (I worked: 18-20 timmar/vecka)
As I am exchange student, in the first weeks I didn't have friends to cooperate with on homework problems, also foreign language doesn't made things easier. I agree that this was my personal problem and the situation was much more easier in last weeks for me.
Yes, I was a bit annoyed after the exam. More than half of the study questions were about finite difference and especially stability. Then I thought that FD was a bigger part of the course and therefore a bigger part of the exam. On the exam it had flipped and more than half was about finite volume. That surprised me. It would have been better to get to see at least one exam and solutions to it. That could give us some insight into when an answer is sufficient or if you want it to be more precise. That was a problem for me in the exam as well. I never knew when I had written too little or too much. And that Matlab question is something you never talked about in class... And update the study questions if there is something in there that you didn't go over.

SPECIFIC QUESTIONS

How many of the lectures and exercises did you attend (in %)?

How many of the lectures and exercises did you attend (in %)?
45
100%
70% (the 30 remaining % I was away)
100
10”
95
90%
95
100%
90%
80%
80%
I missed one lecture because of course collision with other course.
90%
100
100%

Was your background adequate for this course (mathematics, programming, physics)?

Was your background adequate for this course (mathematics, programming, physics)?
Yes
Yes except for mathemetics (visualization)
Yes
Yes
Yes
yes
Yes (Fluid mechanics)
The background was quite adequate.
Yes!
In terms of math, no, since I have no previous experience of tensor/Einstein notation which I feel wasn't covered in the course properly. Also I feel like my limited knowledge of the more general fluid mechanics equations (Navier-Stokes, Euler etc.) also held me back.
I was a little bit poor in numerical methods but thank to the group work I was with for the assignments I has no difficulties to recover. Probably without my friend in the group I would have had much more difficulties.
I had quite good background in mathematics. I wasn't very good at programming and I was forced to improve (I appreciate it). I have taken course from fluid dynamics, but I didn't remember a lot of things. It was very good that basics were repeated at the beginning of the course.
No, it requires more programming skill than I have. My mathematics background is also not well-prepared for this course.
yes
No, it was not. I try to do it hard

What did you think about the difficulty/speed of the course in general?

What did you think about the difficulty/speed of the course in general?
It felt difficult to follow since there wasn’t a clear red thread and the HWs did not directly correspond to lectures.
Speed: ok Difficulty: high
ok
OK speed, some complex material
Course was really intense. Sometimes a bit too much.
Both high
Speed is good and one can follow the lecturer
The incompressible part (Section after the compressible) felt a bit fast.
Good but needs better learning methods for students.
A bit too hard for me, given my background.
The course is actually hard for students, many Phd attended it infact. I wish I could have had more time to dedicate on the course, because to keep the track a hard weekly work is required.
It was intensive course. I invested most of the time to this course.
The speed is okay except the back-to-back homework.
I thought it was quite difficult but the speed was fine
please more slowly

What did you think about the lectures (teachers, organisation, explanations, course handouts)?

What did you think about the lectures (teachers, organisation, explanations, course handouts)?
It felt like we were jumping all over the place with their content. Would have liked to have exercise sessions with questions related to the exam.
Phillip : A
good
Good
Mr Schlatter is an excellent professor with high ability of transmitting his thought process to the class. His lectures always had a clear goal and way of reaching it, a fact that really boosted the understanding of the course. Unfortunately, I couldn't note the same about his colleagues, who are good scientists, but do not reach the same standards as far as teaching and lecturing is concerned.
Phillipp top, Ardeshir good, sometimes just writing down the lecture notes on the whiteboard without adding supporting/ integrating comments.
Good structure.
Extremely organised.
Very good lectures! Some of the better ones I've had at KTH.
Everything was fine.
Teachers were helpful, I have only good experience. Course handouts were perfectly prepared. As I said it would be better for me to present the topic on the lecture in a little bit different way than exact following the handouts.
The lecture handouts use a lot of abbreviation or context is missing and it's difficult to keep track. But overall it's okay.
Teachers very nice. Course handouts very nice. But could ass some more basic explanations to make sure we all understand.
It is good.

What did you think about the homework sessions and the project (organisation, explanations, literature)?

What did you think about the homework sessions and the project (organisation, explanations, literature)?
A lot of work, compare to the rating.
Not really clear what is the minimum required to pass (75% at 5 out of 6 hw? an average of 75% after 6 homework...?)
It's good to have feedback on the homeworks.
Organisation of the project was good. explanation of the homework wasnt always perfectly planned.
The project description was very detailed
The highlight to say. Extremely useful.
Way too time consuming and the lack of affordable literature made it very difficult to find information on some of the topics not covered in the lecture notes.
See above
Also I didn't like that homework sessions were after the deadline. Maybe I just didn't get the point.
For the hw and the project, since we're not familiar to the MATLAB and OPENFOAM, it might be better if there was lab session once a week where all students could work and interact or just in case that we need help with the programming.
Difficult and like I said above might be good to have a question session once a week.
It is so difficult. In project, I think we should work in group.

What did you think of the OpenFOAM part, and should that be extended/shortened?

What did you think of the OpenFOAM part, and should that be extended/shortened?
Interesting but too short
This part was very short, I'm not sure it is sufficient to learn to use OpenFOAM.
It should be extended but with a longer tutorial
Feels added artificially on top of high workload, better shortened and replaced by extended matlab project task
yes
Maybe it is too much to include it in this course as well. Because the layout of the course was more theoretical anyway and not aiming to give knowledge about how to run actual simulation software
Should be extended. We didn't get to produce results immediately after the session. But, took a bit of time. Explored by self yet, could be more helpful if we had an additional session where we can clarify questions after we have tried working on OpenFOAM.
It was intresting, it could be extended.
I would extend this part. I don't have previous experience with OpenFOAM, it was interesting for me but it was presented in very short time.
As I mentioned, I would suggest to have the laboratory session.
I still haven't done the OpenFOAM part of the project
It should be extended.

Would you prefer to switch to Python instead of Matlab for the course?

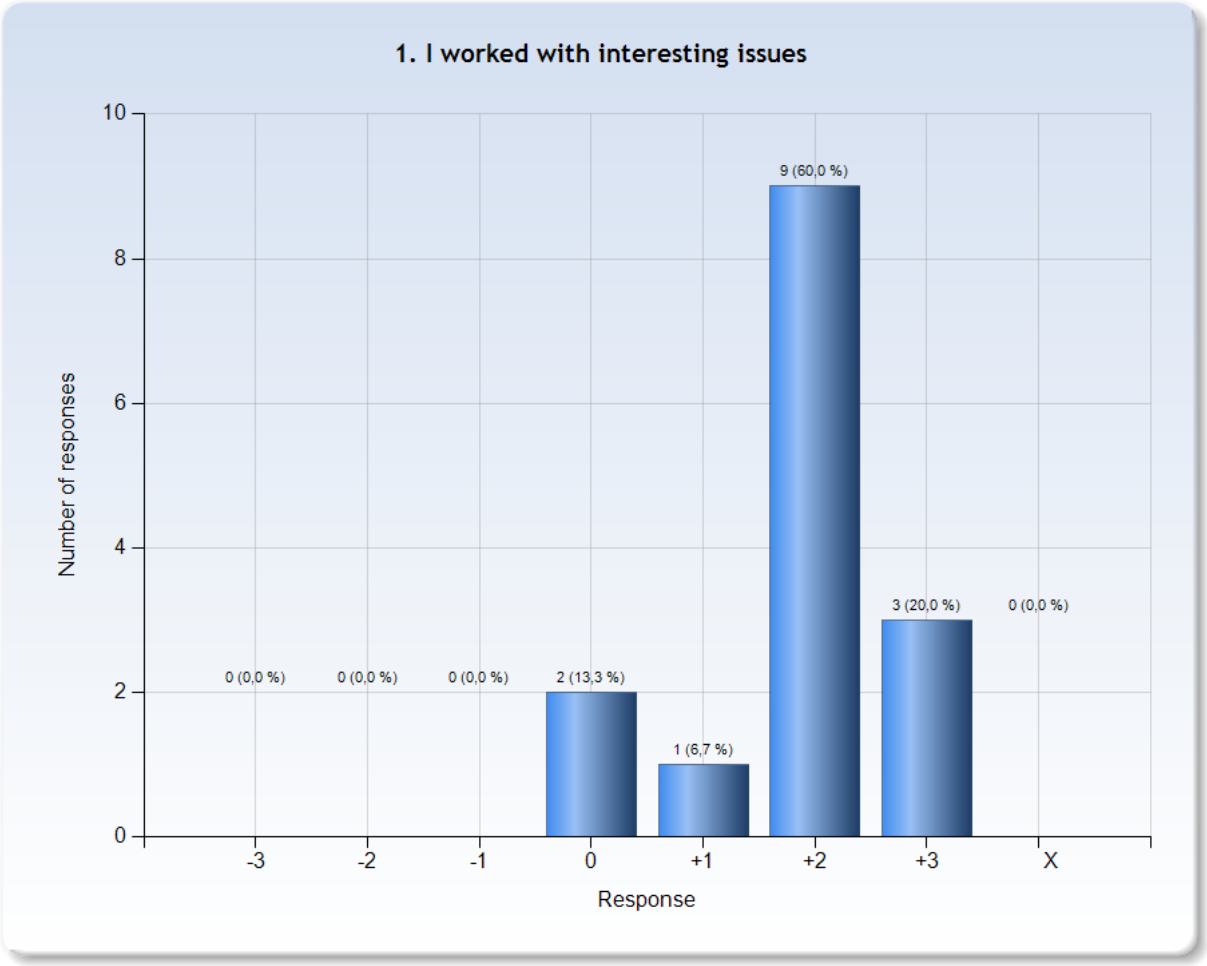
Would you prefer to switch to Python instead of Matlab for the course?
I would prefer it to be more open. Also would be nice if some of the numerically oriented HWs could have an alternative for those more interested in fluid mechanics
No
I know both so I don't care
The course was mainly on Matlab, for me the small part on OpenFOAM is meaningless.
Yes
MATLAB has better support, python is easier. Would be nice to choose.
don't know, no experience with python
It is probably useful for later (python), but most students prefer probably matlab, because they use in all other courses
Yes. A lot.
No. Not everyone at KTH has previous knowledge of Python while everyone has previous knowledge of MATLAB.
Absolutely not!
I think that Matlab in general is suitable only for university and school purpose because of high cost. Of course it is intuitive and easy to use. I think that Python would be more practical in that way.
MATLAB
I've never used Python so I cannot tell
No comment.

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



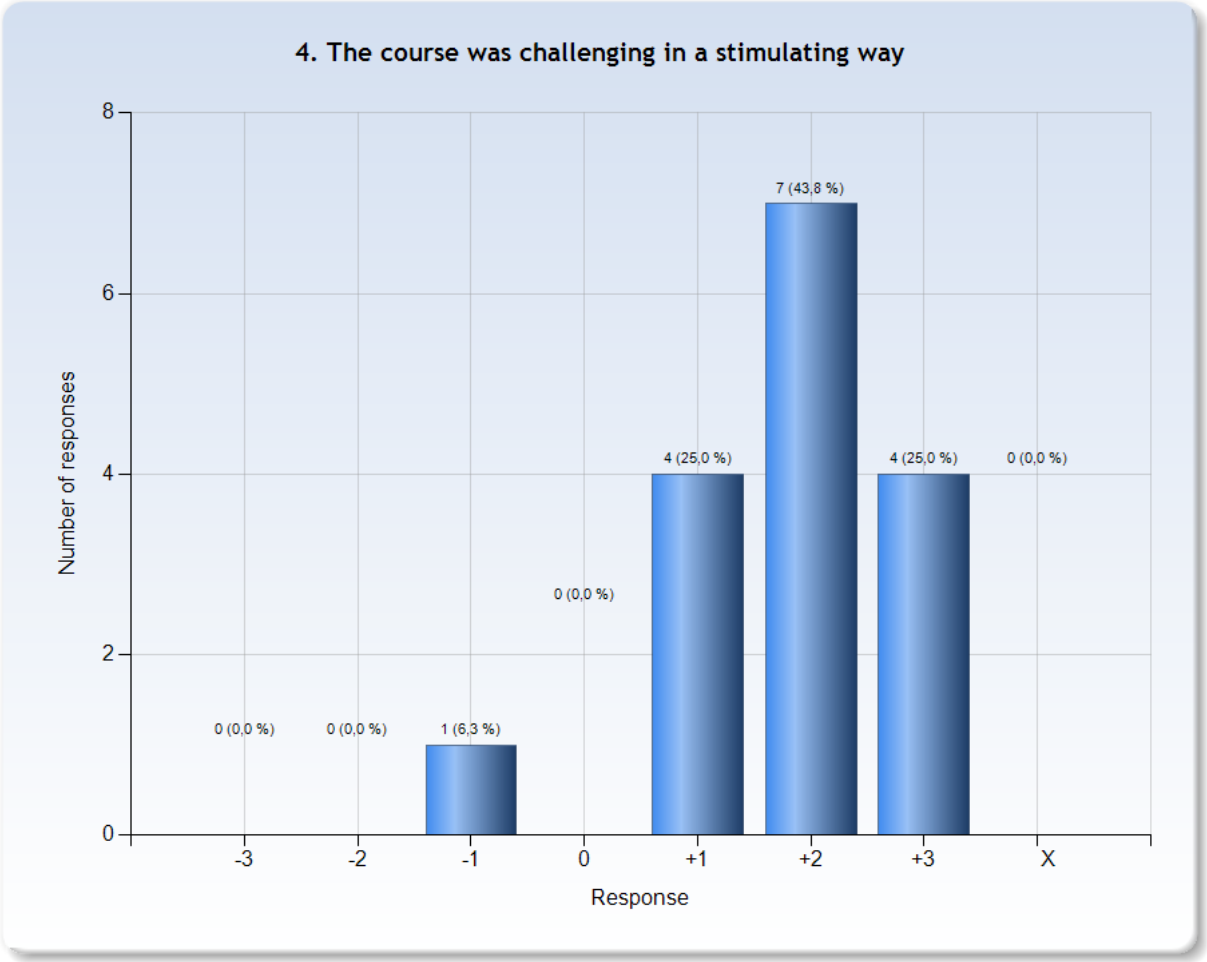
Comments

Comments (My response was: 0)

A bit too much focus on numerical analysis. Would have preferred more fluid dynamics in the homeworks

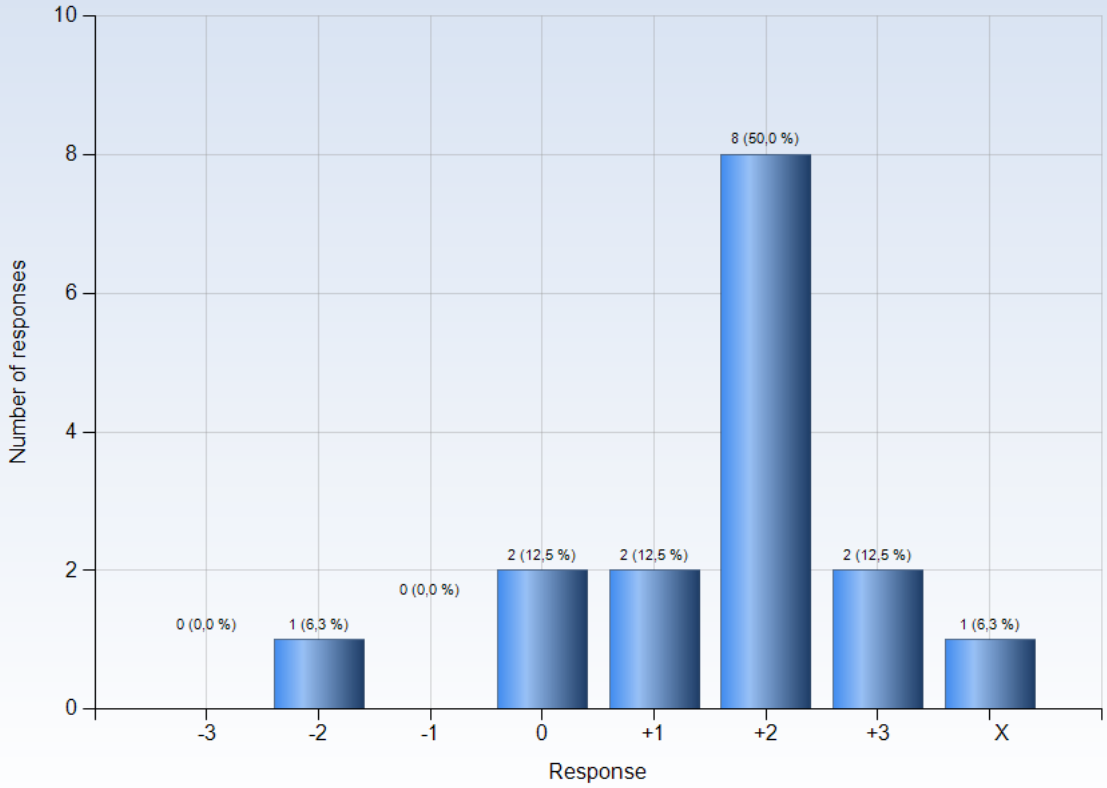
Comments (My response was: +2)

Writing discretizations by hand is sometimes a little bit boring... but the content is overall very interesting

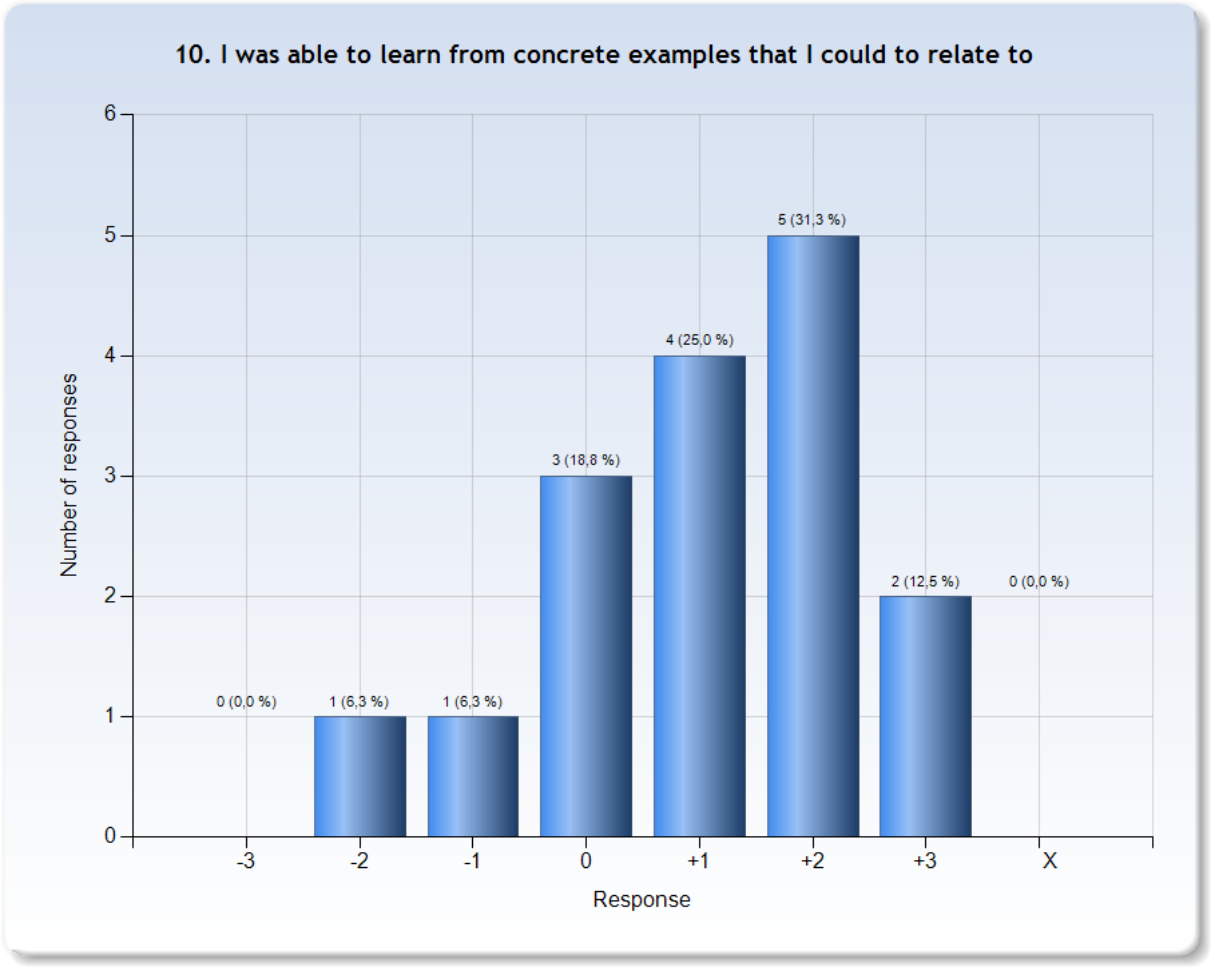


Comments

7. The intended learning outcomes helped me to understand what I was expected to achieve

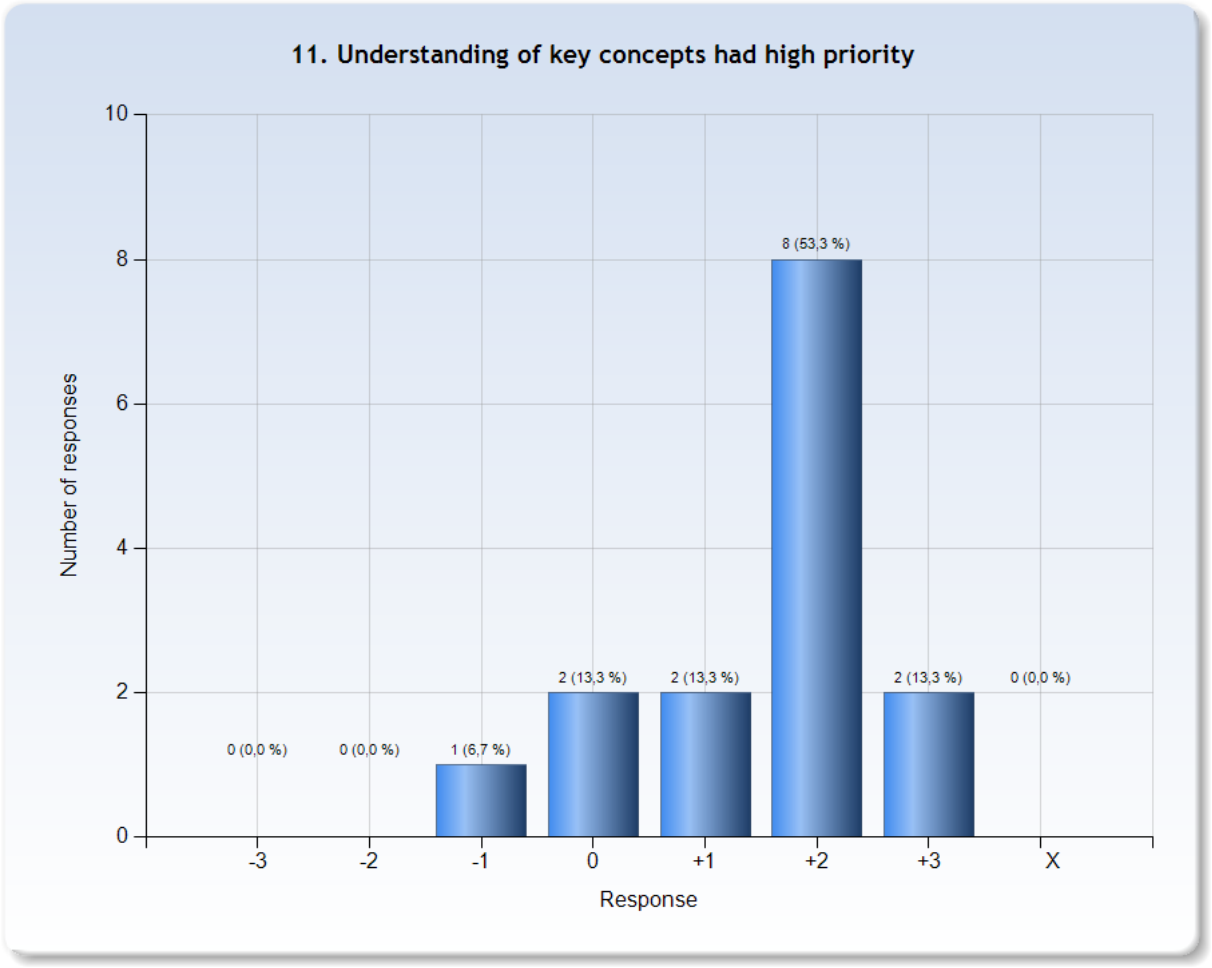


Comments



Comments

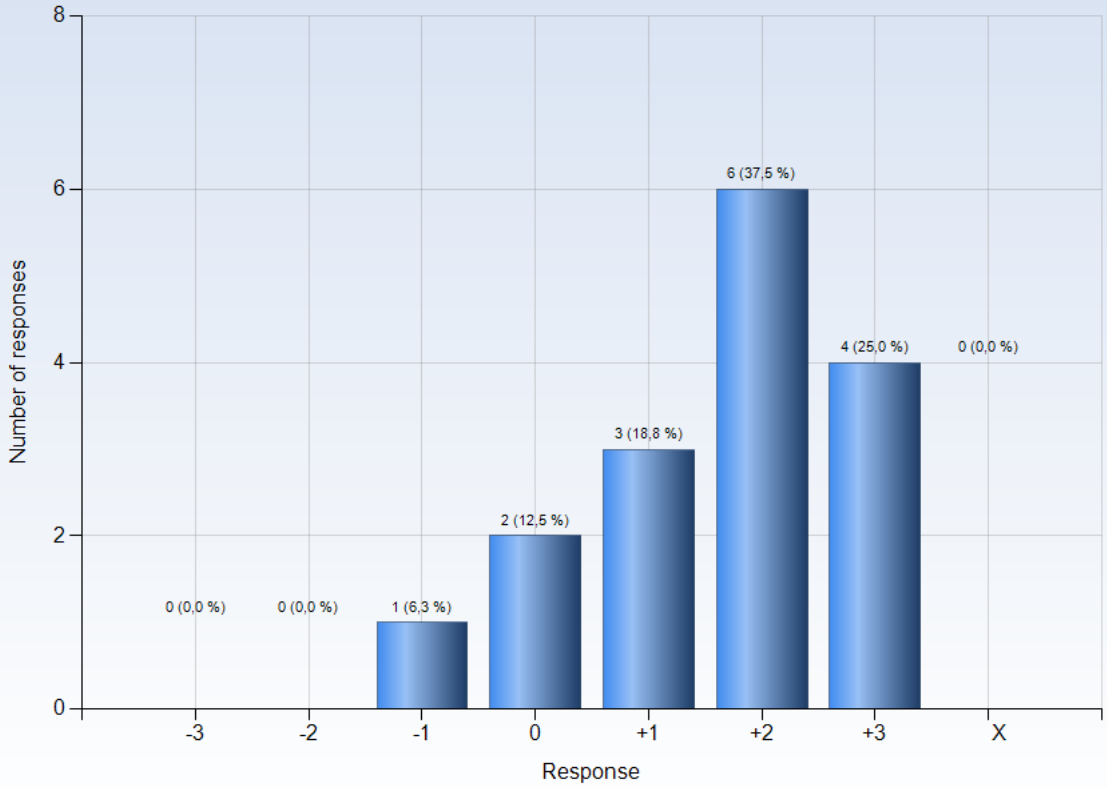
Comments (My response was: +1)
Advection equation, advection equation...



Comments

Comments (My response was: +3)
On the other hand some extended additional literature would be nice.

12. The course activities helped me to achieve the intended learning outcomes efficiently



Comments

Comments (My response was: -1)

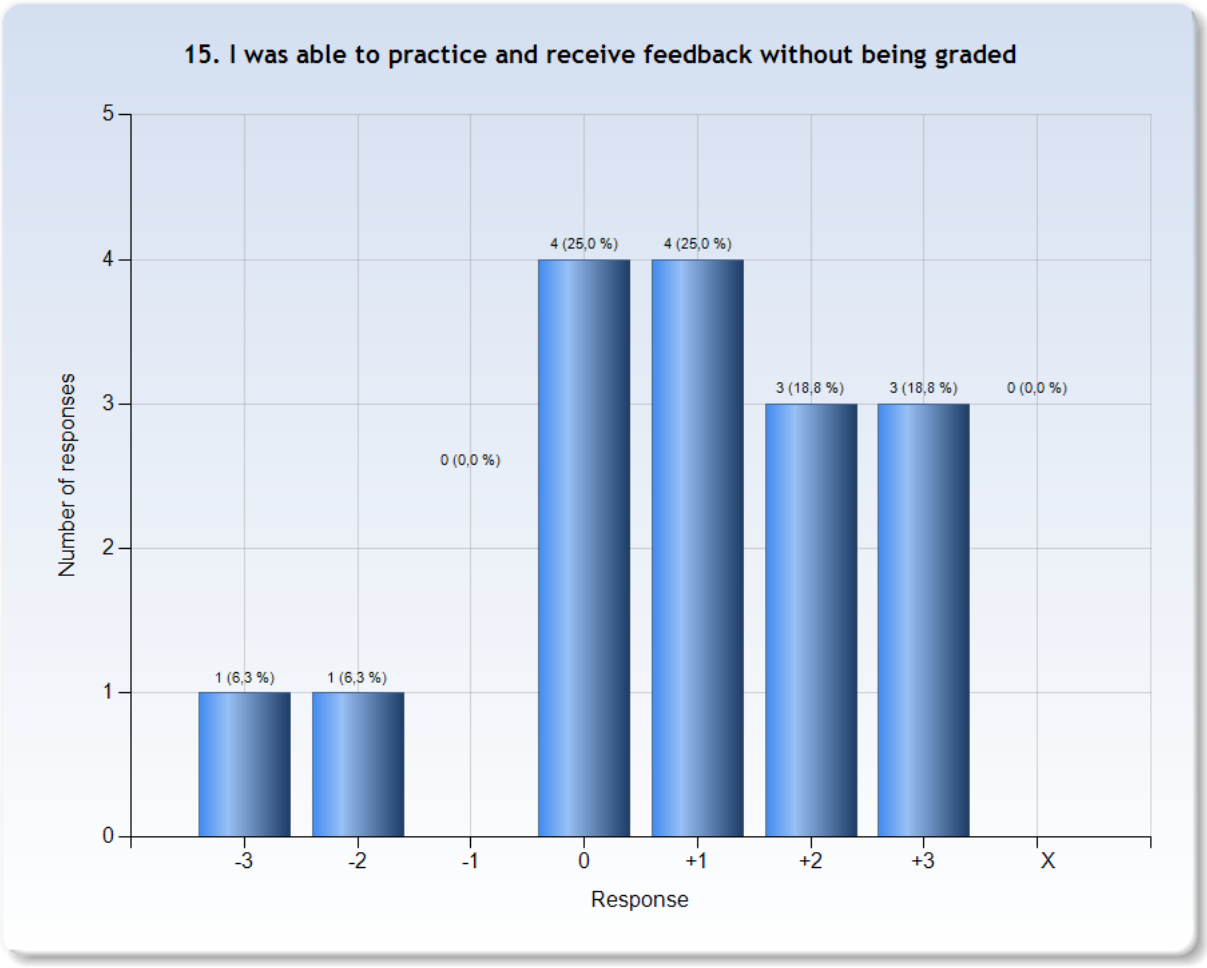
Homework helped me to understand outcomes, but I think it wasn't very efficient way due to really high time consuming.

Comments (My response was: +1)

The home work assignments took to much time, and didn't leave me enough time to study the topics not covered by the home works. I would have preferred less time consuming home assignments but with a wider range of topics covered. Say, a couple of the study questions each week with a big project at the end.

Comments (My response was: +2)

Homeworks were useful !



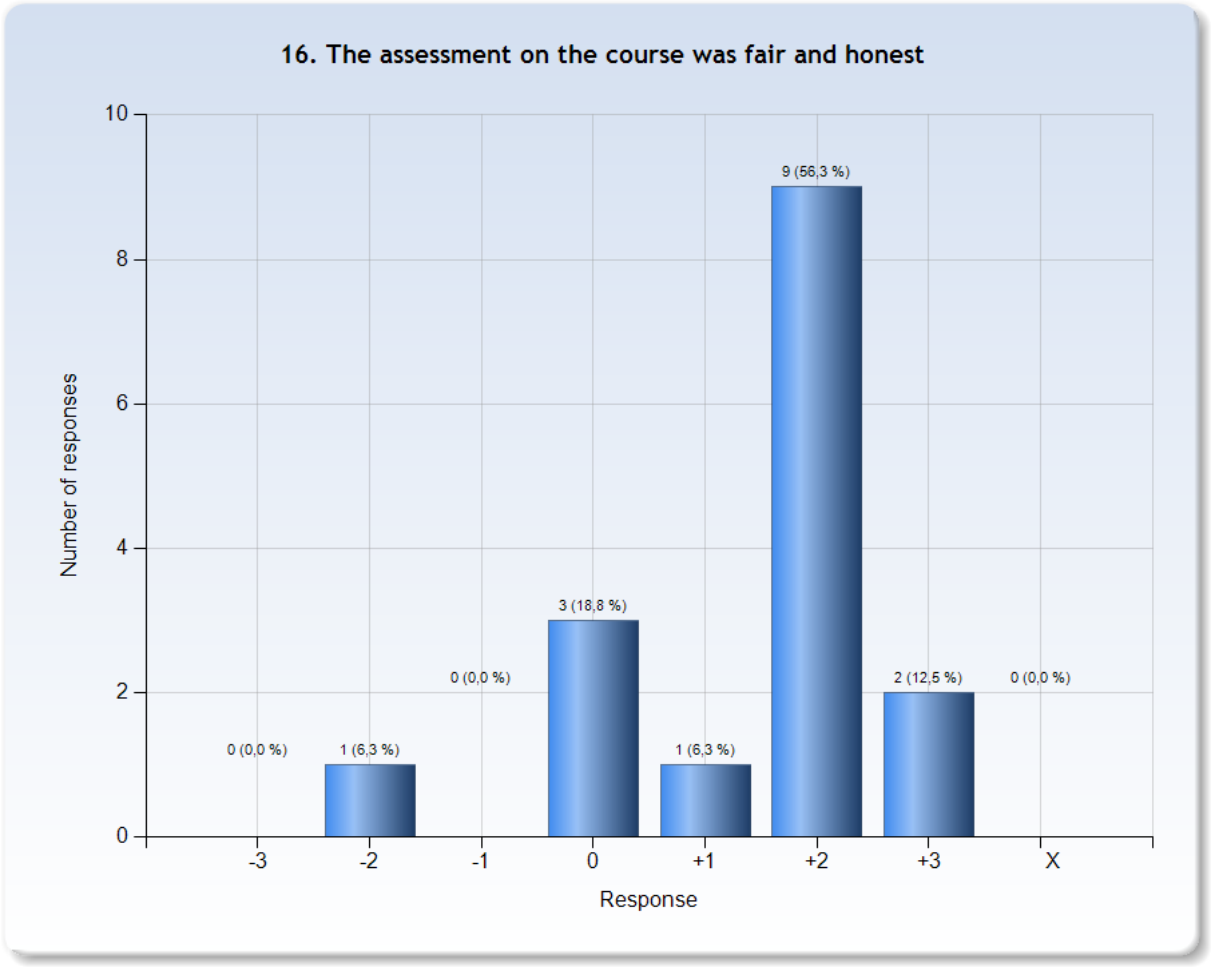
Comments

Comments (My response was: -3)

The homeworks were graded

Comments (My response was: -2)

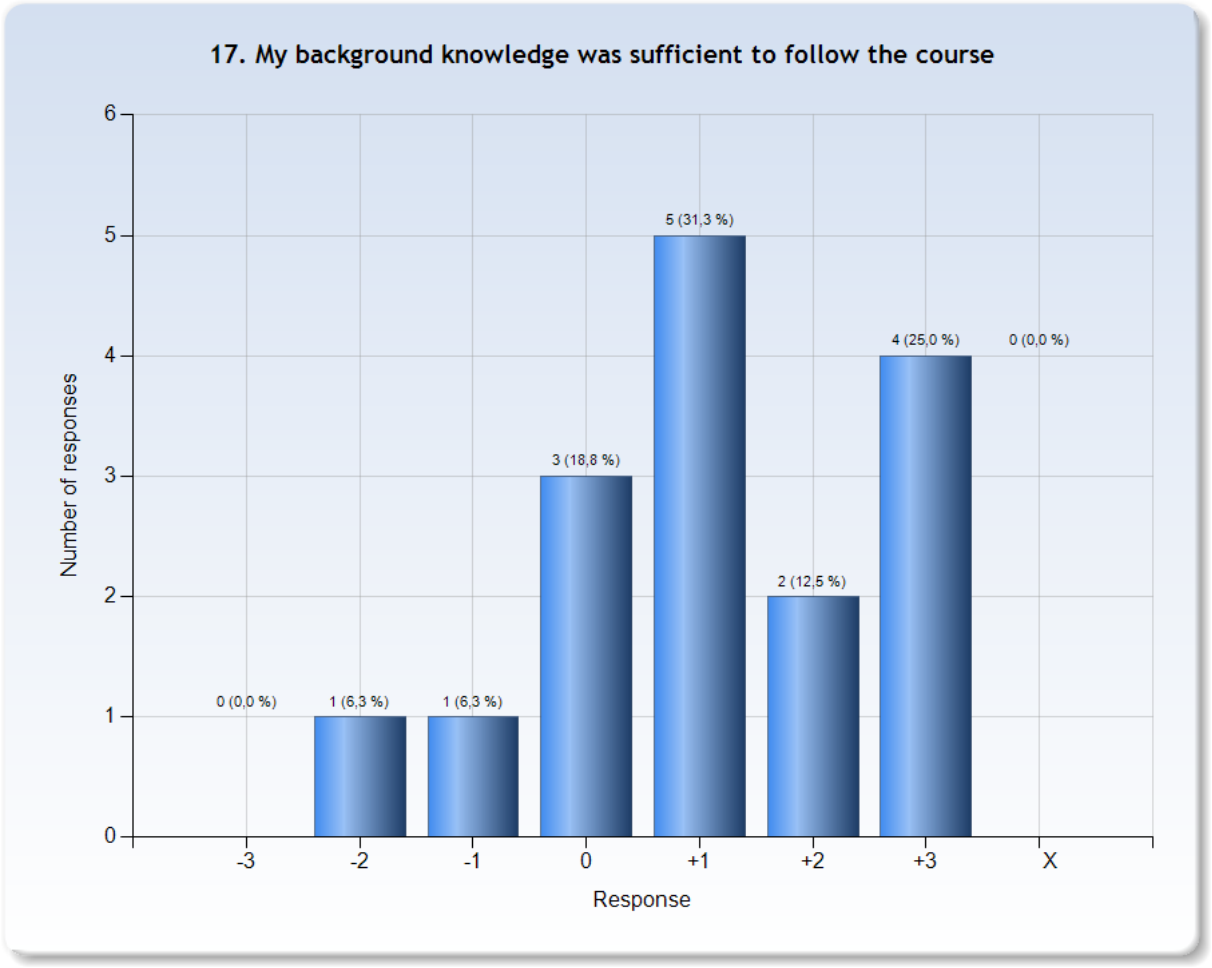
I didn't get feedback of my homework if I get between 75 and 100 percent. I could only guess what are my mistakes.



Comments

Comments (My response was: -2)
Have no idea, the exam has not been yet

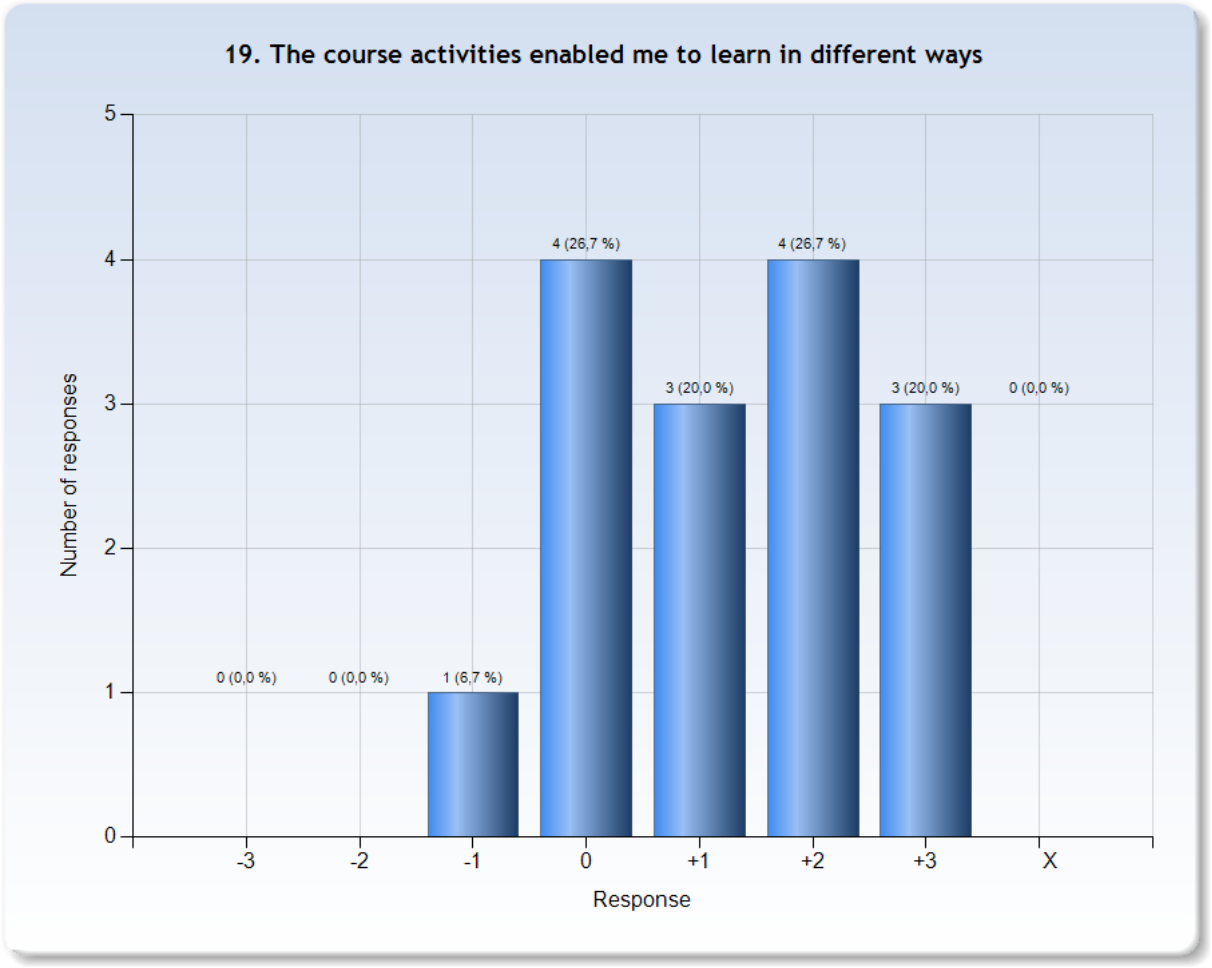
Comments (My response was: 0)
Scoring motivation is a bit hard. Getting an A feels extreme.



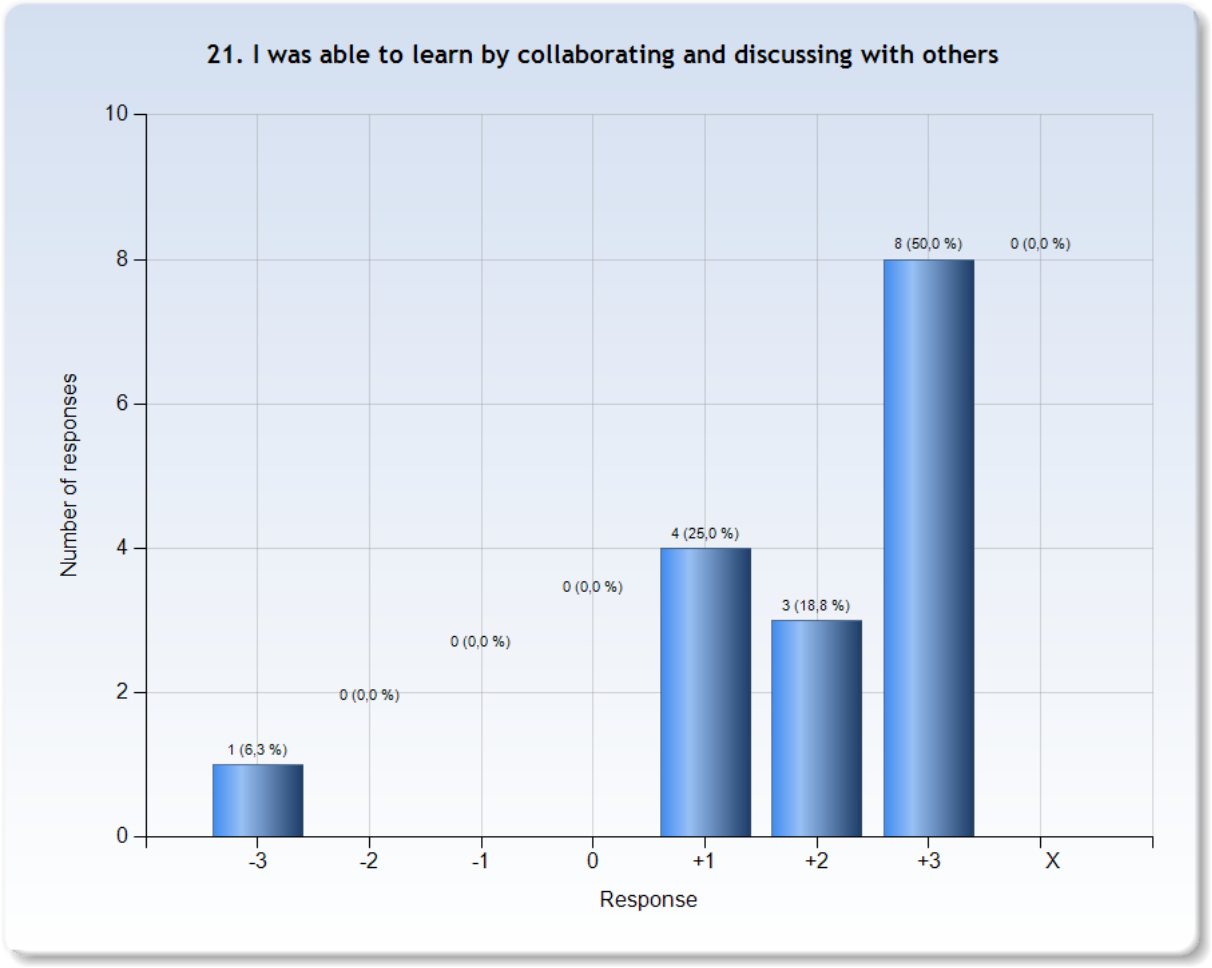
Comments

Comments (My response was: -2)
This course definitely requires more background knowledge than what I had as an aerospace engineering student. Mostly courses such as vector analysis and more advanced courses in fluid mechanics.

Comments (My response was: -1)
It was hard for me to visualize (domain of dependence etc..)


19. The course activities enabled me to learn in different ways
Number of responses
Response
0 (0,0 %)
0 (0,0 %)
1 (6,7 %)
4 (26,7 %)
3 (20,0 %)
4 (26,7 %)
3 (20,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

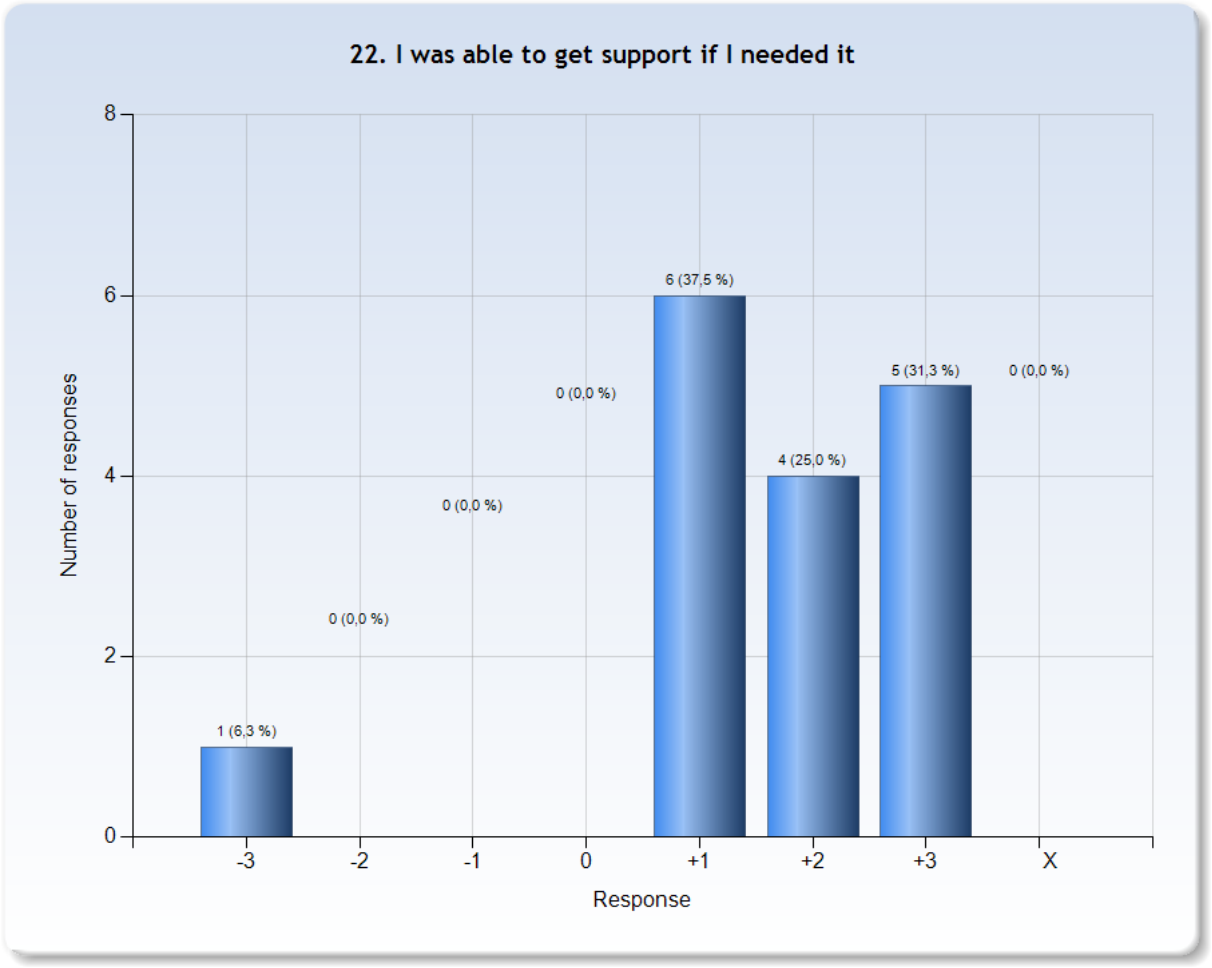
Comments



Comments

Comments (My response was: -3)
Since we were not allowed to collaborate on the homework report, I felt it impractical to work with others more than just discussing some things

Comments (My response was: +1)
It become better in the second half of the course.



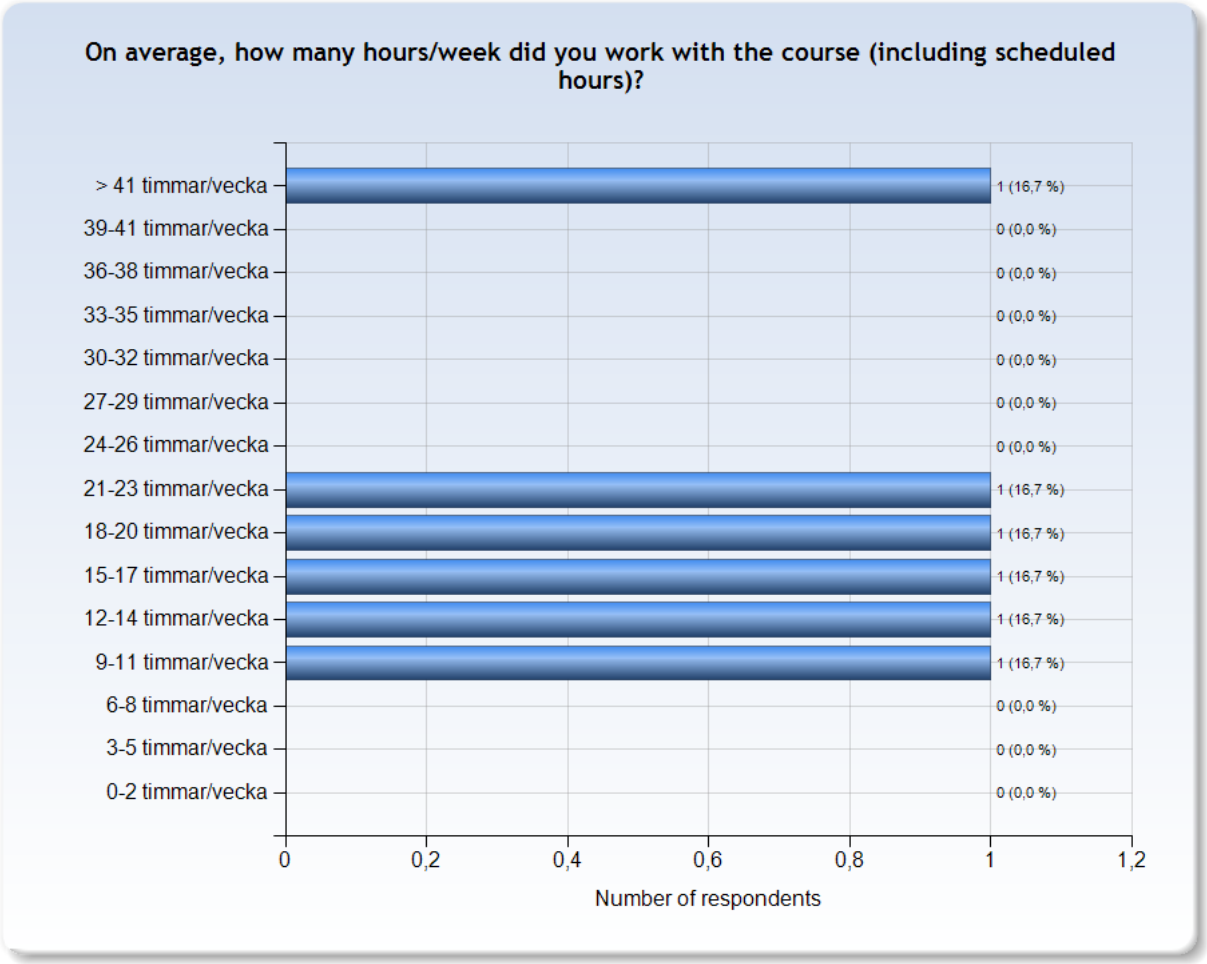
Comments

Comments (My response was: -3)
There were no exercise sessions in the course

FSG3114 - 2020-03-01

Antal respondenter: 9
Antal svar: 6
Svarsfrekvens: 66,67 %

ESTIMATED WORKLOAD



Comments

Comments (I worked: 9-11 timmar/vecka)
It was a bit overwhelming to do the course with the Phd project, in weeks where there were 4 classes of 2 hours.

Comments (I worked: 12-14 timmar/vecka)
The homework assignments where deceptively time consuming! I thought the content covered in the homework was very interesting and relevant to what we had studied in class (I especially enjoyed the shock tube home work). However they were worth very little to the final grade and weren't required for any questions in the exam. Overall I am still glad I did them just because they were interesting.

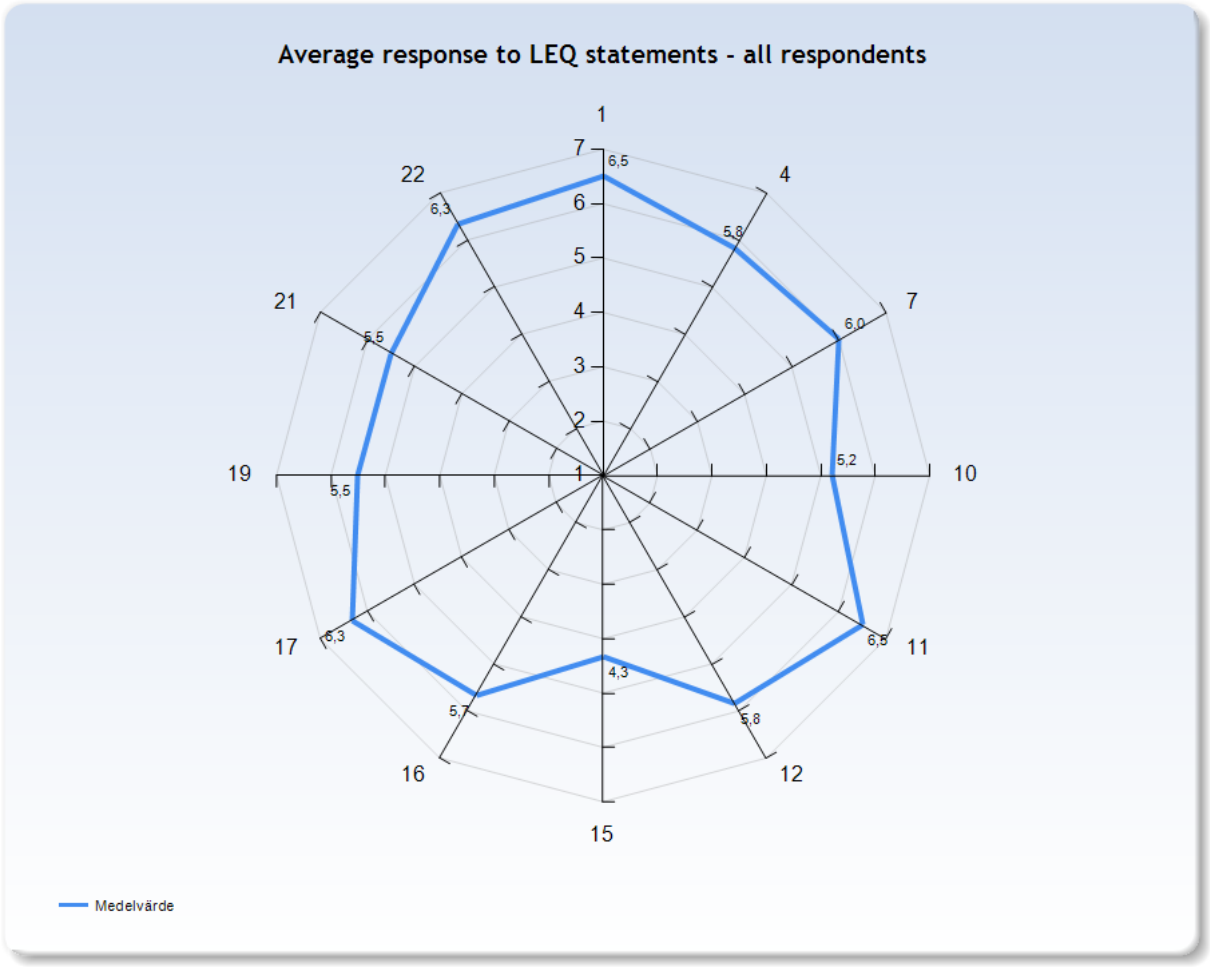
Comments (I worked: > 41 timmar/vecka)
It is a demanding course, but it is a very useful course for students who will work on the numerical simulation.

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.


Average response to LEQ statements - all respondents
1
4
7
10
11
12
15
16
17
19
21
22
6,5
5,8
6,0
5,2
6,5
5,8
4,3
5,7
6,3
5,5
5,5
6,3
Medelvärde

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

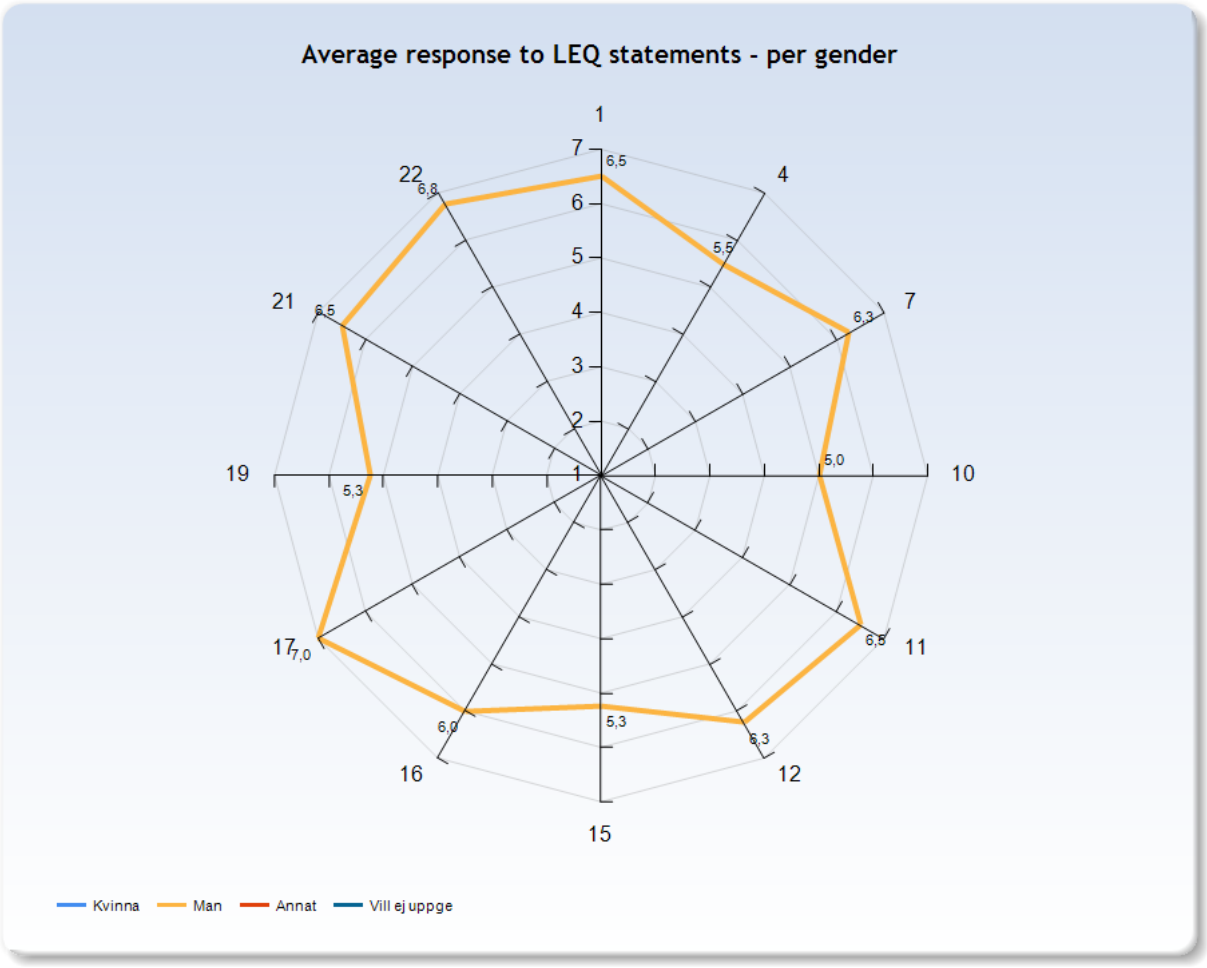
Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

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

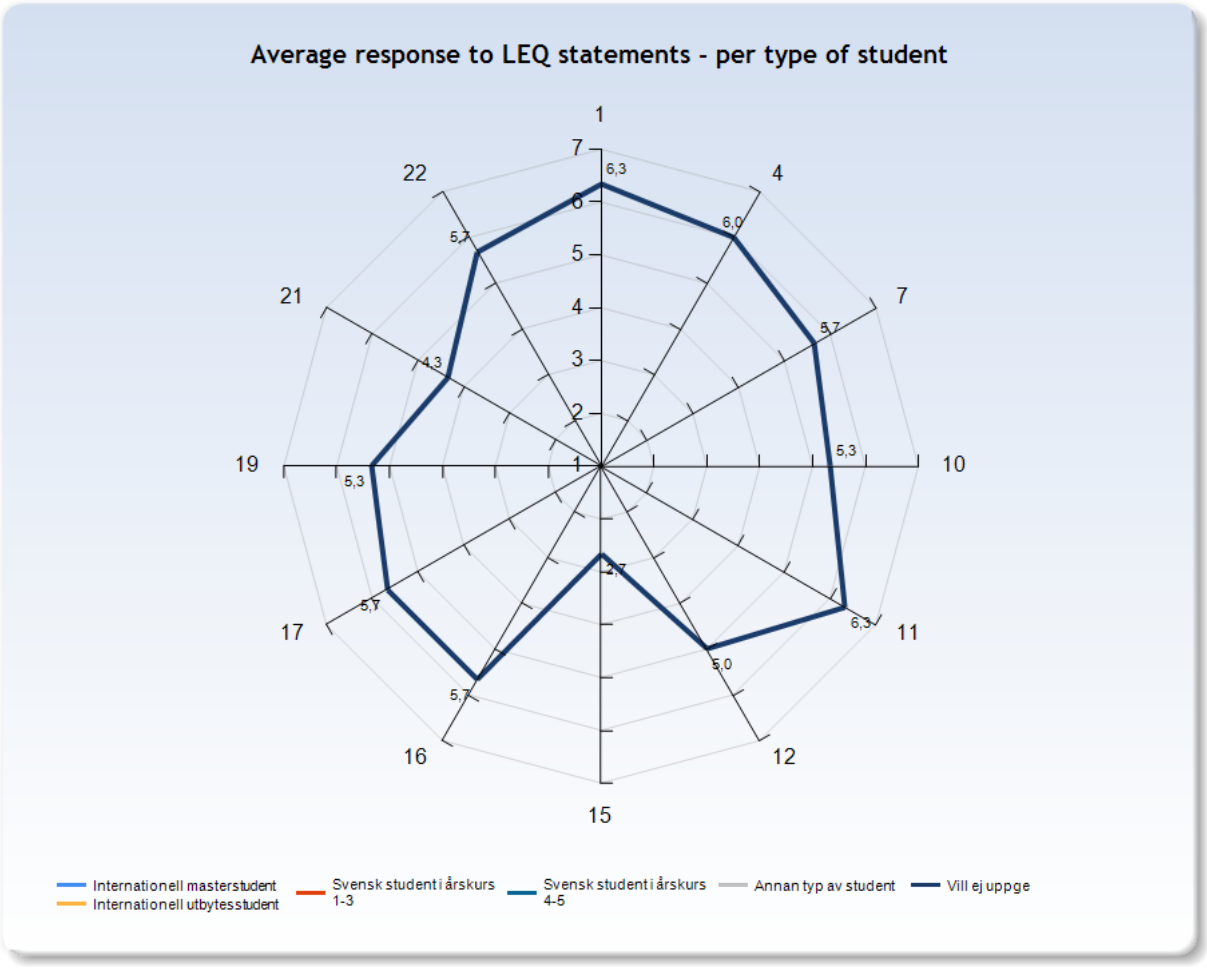
Elmgren, M. & Henriksson, A-S. (2014). *Academic Teaching*, Chapter 3, pp. 57-72. Lund: Studentlitteratur.

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.

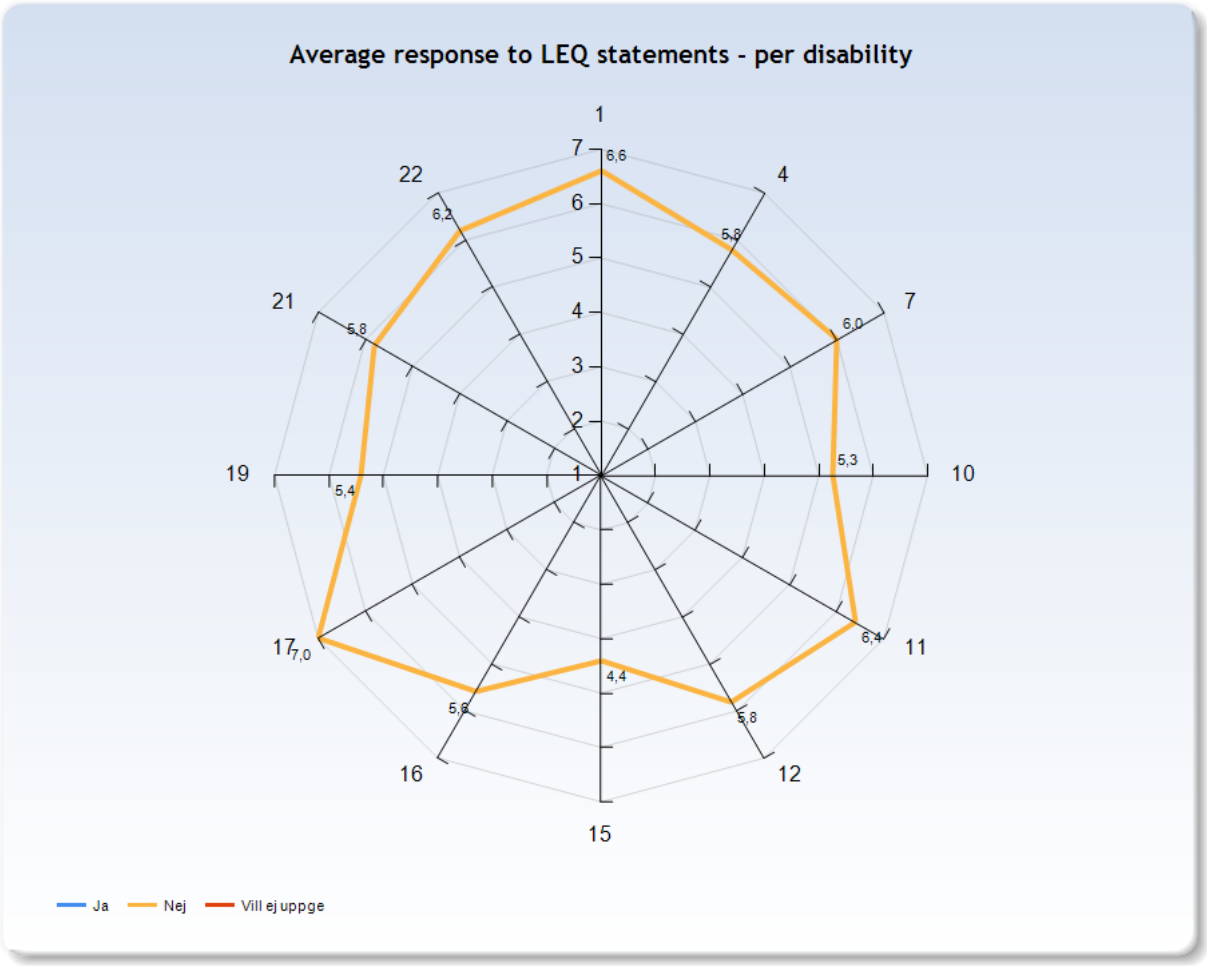

Average response to LEQ statements - per gender
1
4
7
10
11
12
15
16
17
19
21
22
6,5
5,5
6,3
5,0
6,5
6,3
5,3
6,0
7,0
6,5
Kvinna
Man
Annat
Vill ej uppge

Comments



Comments

Comments (I am: Annan typ av student)
The course can be overwhelming for Phd students, especially concerning the deadline of the project too close from the exam.
I am a PhD student.


Average response to LEQ statements - per disability
1
7
6
5
4
3
2
1
6,6
4
5,8
7
6,0
10
5,3
11
6,4
12
5,8
15
4,4
16
5,8
17
7,0
19
5,4
21
5,8
22
6,2
Ja
Nej
Vill ej uppge

Comments

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)

Focus on the most important aspects of CFD

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)

I think it did a remarkable job of cramming a ton of content into a short amount of time. Philipp and Ardeshir were terrific and engaging lectures as were Marco and Luca.

I particularly enjoyed the focus on PDE classification and how that influences the numerics.

Also I think the online resources were very well managed. This was my first course at KTH so maybe all the courses are so well managed. But i found the lecture notes to be very complete and relevant, the study questions to be incredibly useful and the feedback on my homework was always very useful. It was clear the markers spent a good amount of time reading through the homework and left detailed comments. Great job!

What was the best aspect of the course? (I worked: 21-23 timmar/vecka)

Thee lectures were interesting. Even though they were rigorous with one lecture almost everyday of the week, the classes were never boring but were instead quite engaging.
The explanation was good.

What was the best aspect of the course? (I worked: > 41 timmar/vecka)

It covers the CFD course from basic to advance topics very well.

What would you suggest to improve?

What would you suggest to improve? (I worked: 9-11 timmar/vecka)

Allow more time for PHD students to handle the final project.

What would you suggest to improve? (I worked: 12-14 timmar/vecka)

In the final lectures I think we spent a bit too much time on long derivations for staggered grids (however at the time of me writing this I still haven't started the project, so perhaps in a week or two I'll be very grateful for those lectures)

What would you suggest to improve? (I worked: 21-23 timmar/vecka)

Not have a written exam, because even with just the weekly assignments, and a project, the work-load in this course is a bit high. It might be better then to skip the written exam.

What would you suggest to improve? (I worked: > 41 timmar/vecka)

To use other programming language. I gave this suggestion because I get used to Fortran an C programming.

What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 12-14 timmar/vecka)

have fun!

What advice would you like to give to future participants? (I worked: > 41 timmar/vecka)

Nothing especial.

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)

Thanks for a great course!

Is there anything else you would like to add? (I worked: > 41 timmar/vecka)

No.

SPECIFIC QUESTIONS

How many of the lectures and exercises did you attend (in %)?

How many of the lectures and exercises did you attend (in %)?
90%
70
I attended around 85% lectures, and I did %84 exercises.
90%
90%

Was your background adequate for this course (mathematics, programming, physics)?

Was your background adequate for this course (mathematics, programming, physics)?
Yes, mechanical engineering
Yes.
yes
Yes

What did you think about the difficulty/speed of the course in general?

What did you think about the difficulty/speed of the course in general?
The level of difficulty was balanced.
Nothing.
not too fast. not too slow.
Difficulty level is high when working on tasks individually and not in groups or teams

What did you think about the lectures (teachers, organisation, explanations, course handouts)?

What did you think about the lectures (teachers, organisation, explanations, course handouts)?
In general, everything was well oganized.
They were nice and knowledgable.
couldn't be happier.
Very good lectures and handouts

What did you think about the homework sessions and the project (organisation, explanations, literature)?

What did you think about the homework sessions and the project (organisation, explanations, literature)?
They were designed in a good manner to help learning.
Very interesting but also very time consuming. Would have been nice if they were worth more marks.

What did you think of the OpenFOAM part, and should that be extended/shortened?

What did you think of the OpenFOAM part, and should that be extended/shortened?
I was not attended in that lecture.
Unfortunately I missed it.

Would you prefer to switch to Python instead of Matlab for the course?

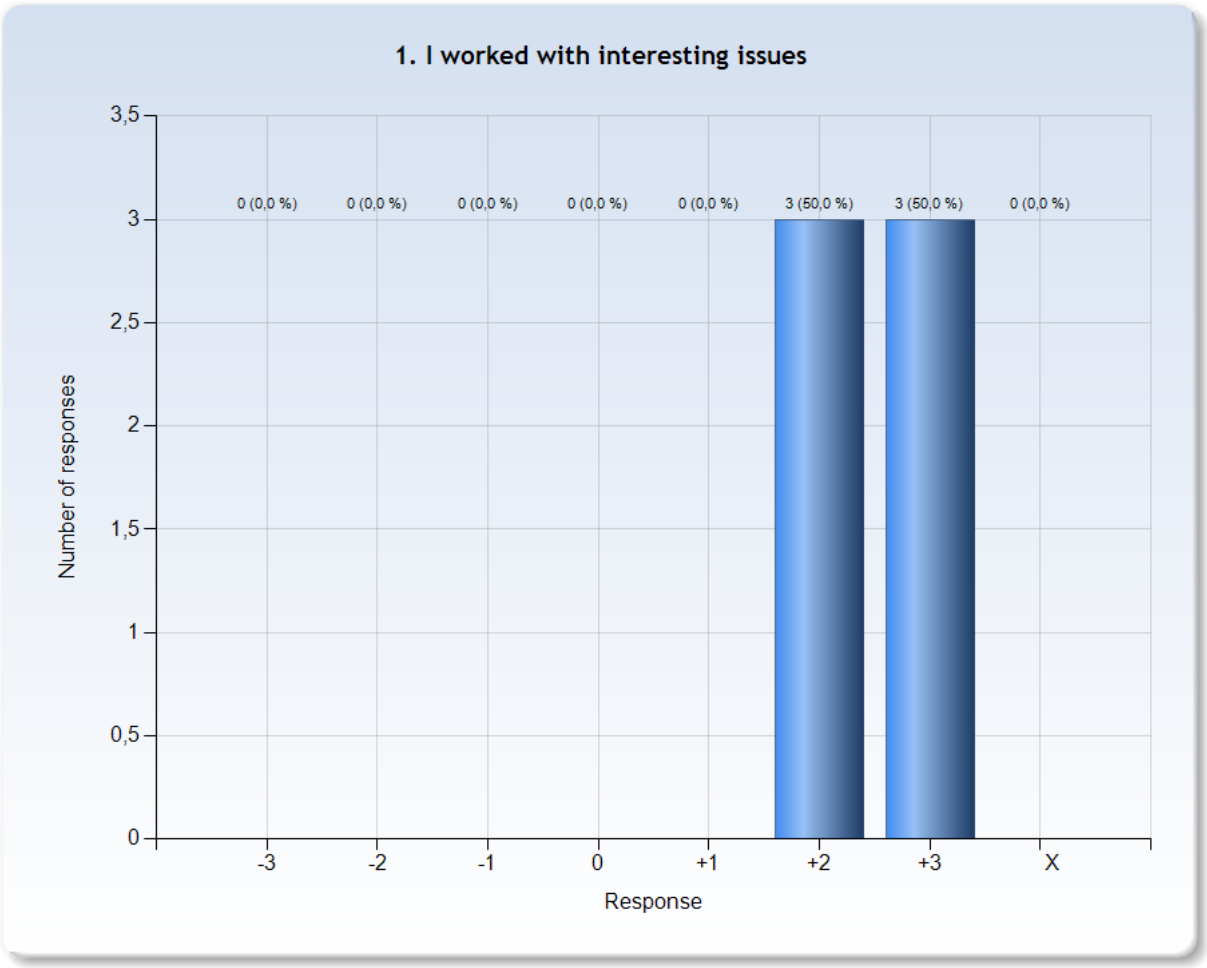
Would you prefer to switch to Python instead of Matlab for the course?
No
yes.
Either way.
No

RESPONSE DATA

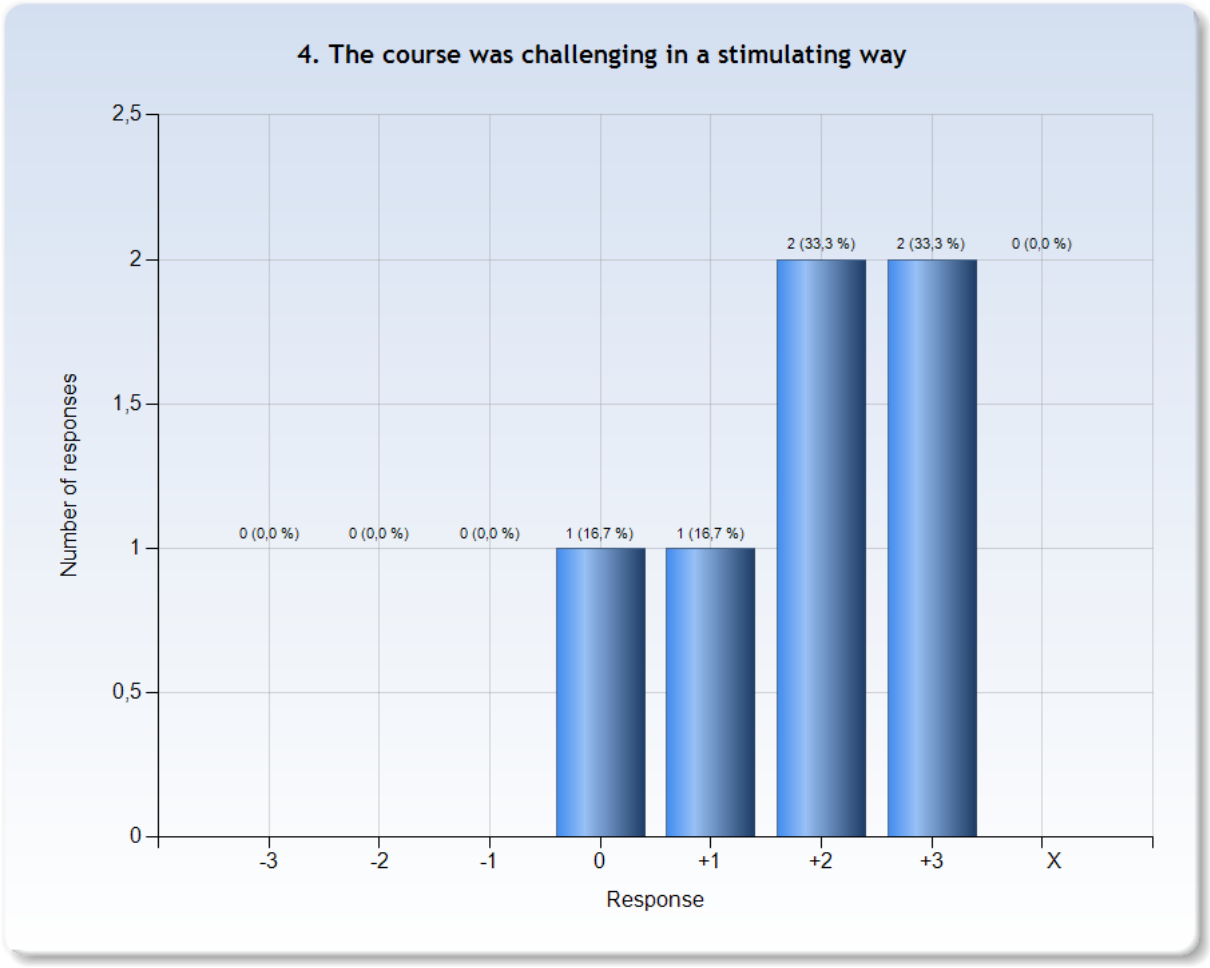
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-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

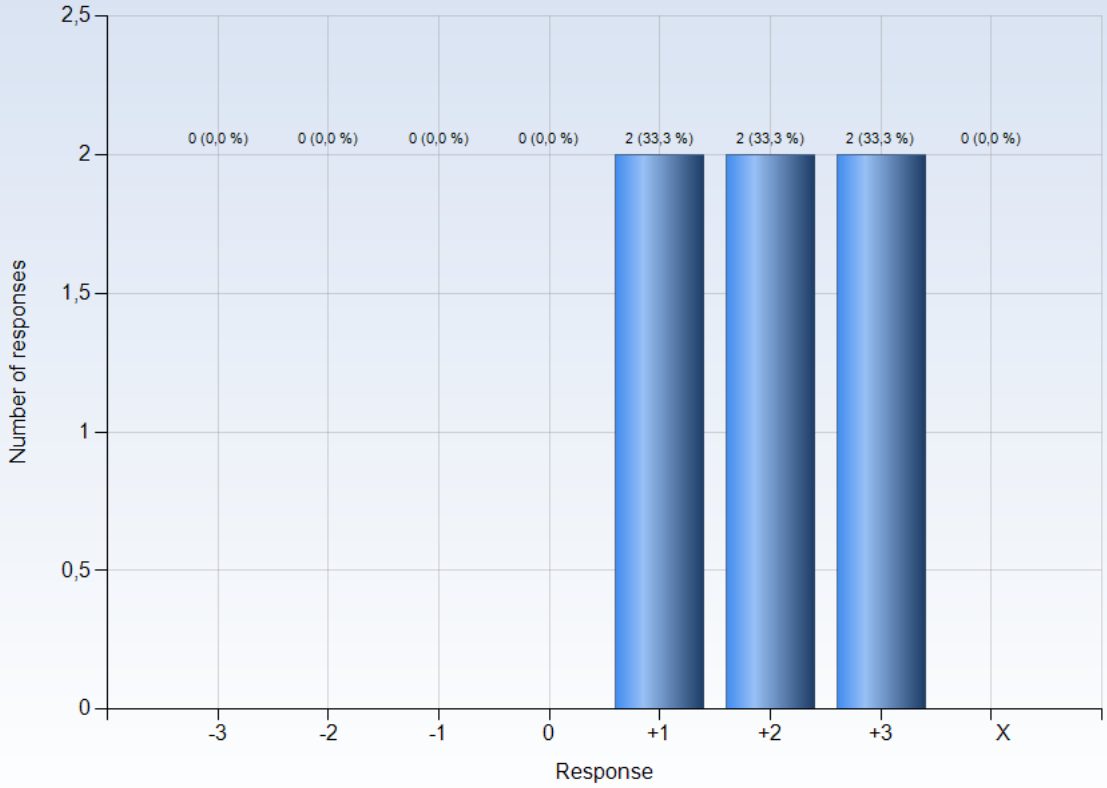


Comments

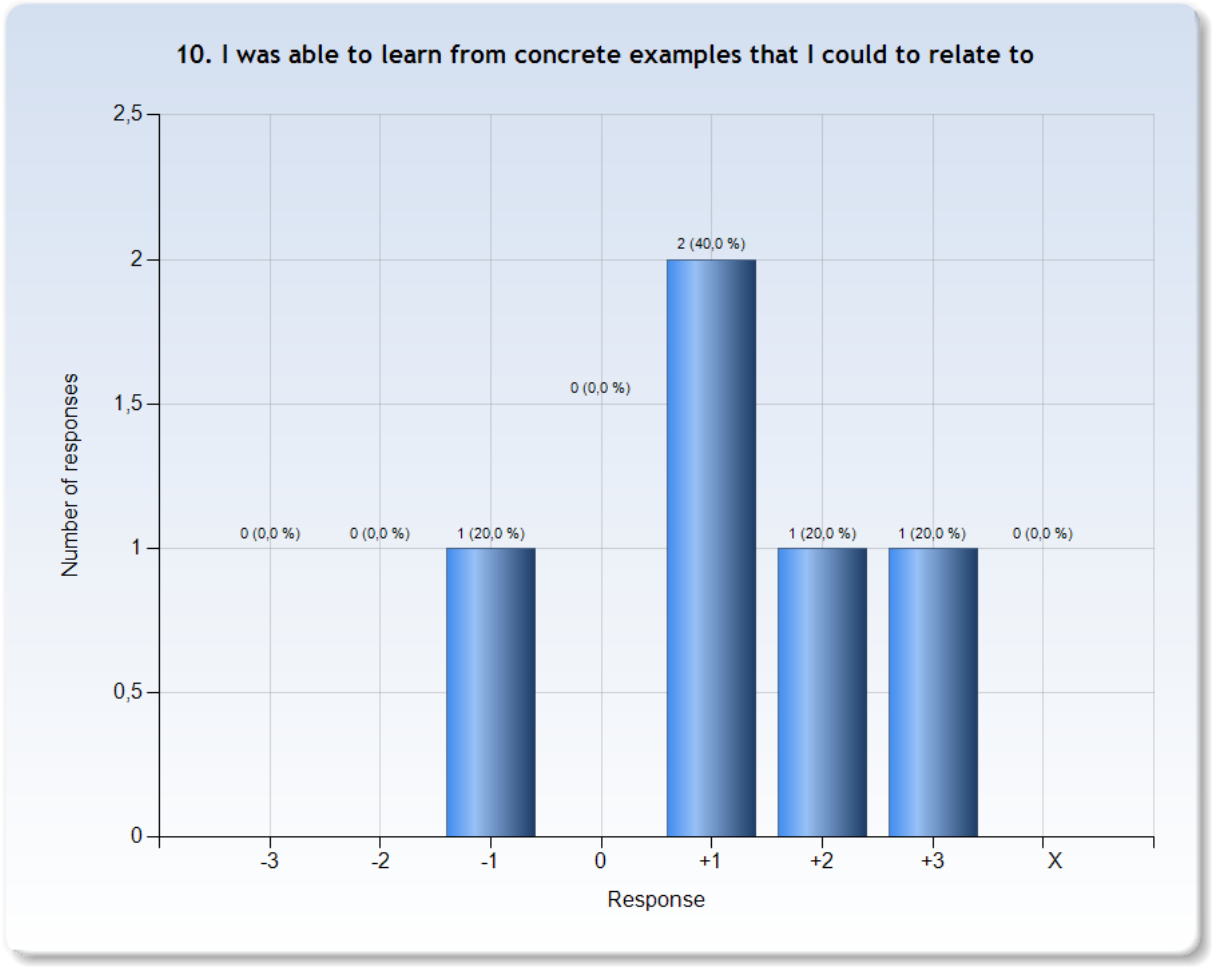

4. The course was challenging in a stimulating way
Number of responses
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
1 (16,7 %)
1 (16,7 %)
2 (33,3 %)
2 (33,3 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments

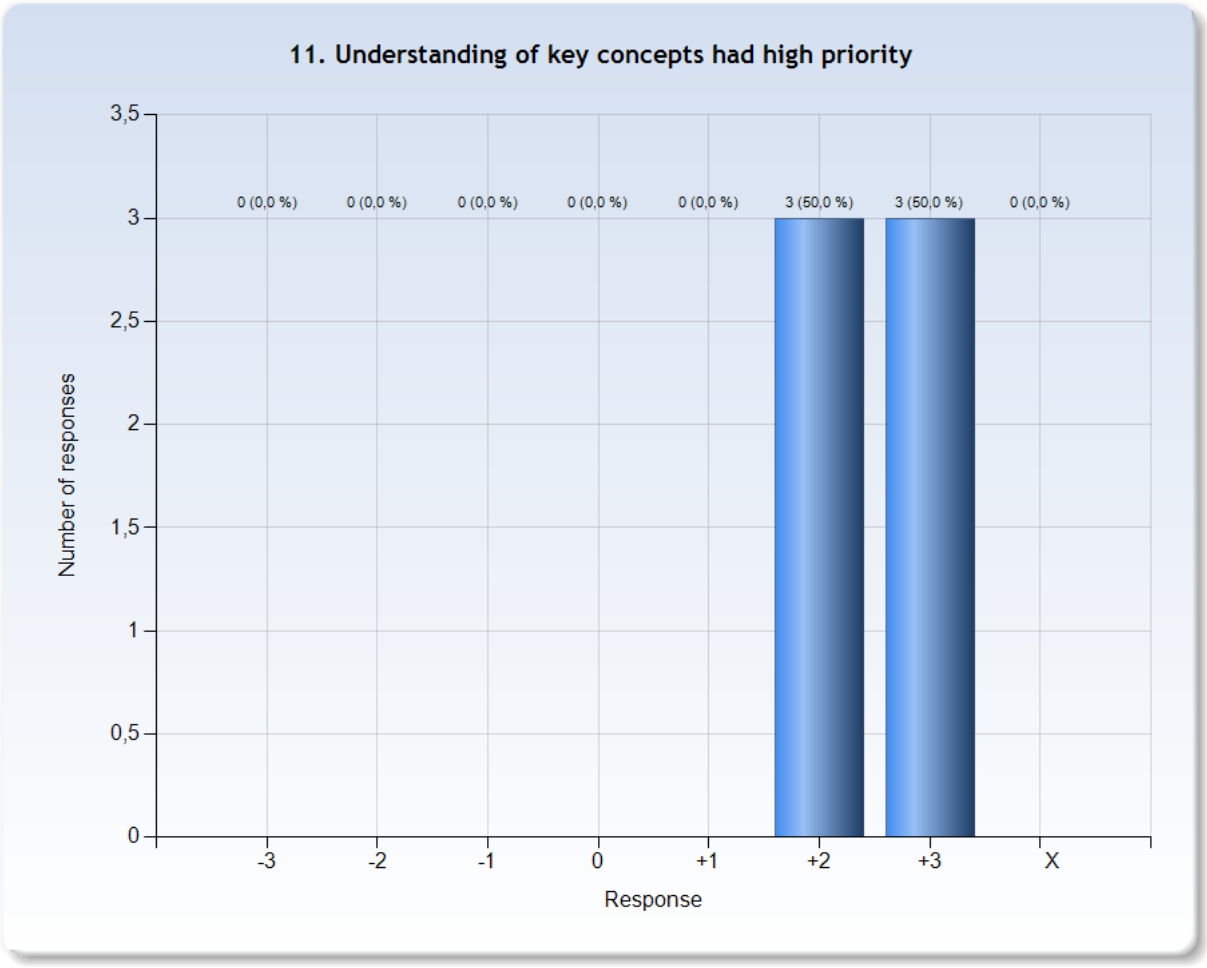
7. The intended learning outcomes helped me to understand what I was expected to achieve



Comments

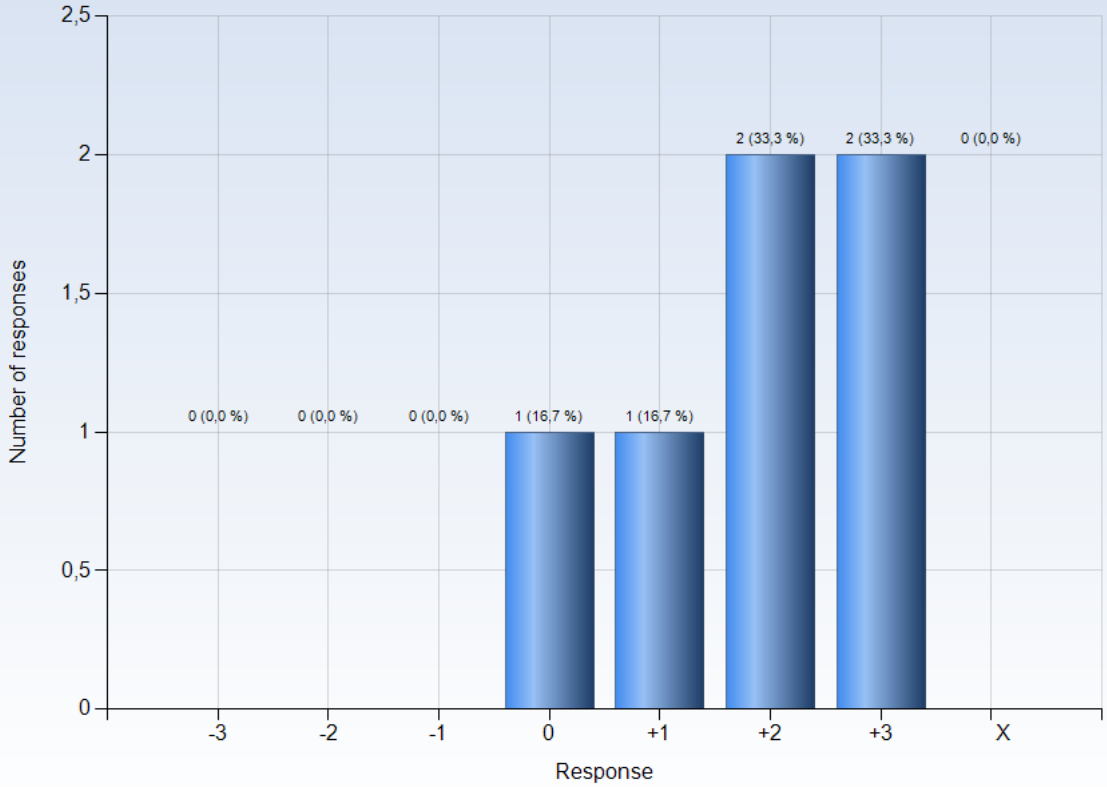

10. I was able to learn from concrete examples that I could to relate to
Number of responses
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
1 (20,0 %)
0 (0,0 %)
2 (40,0 %)
1 (20,0 %)
1 (20,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments

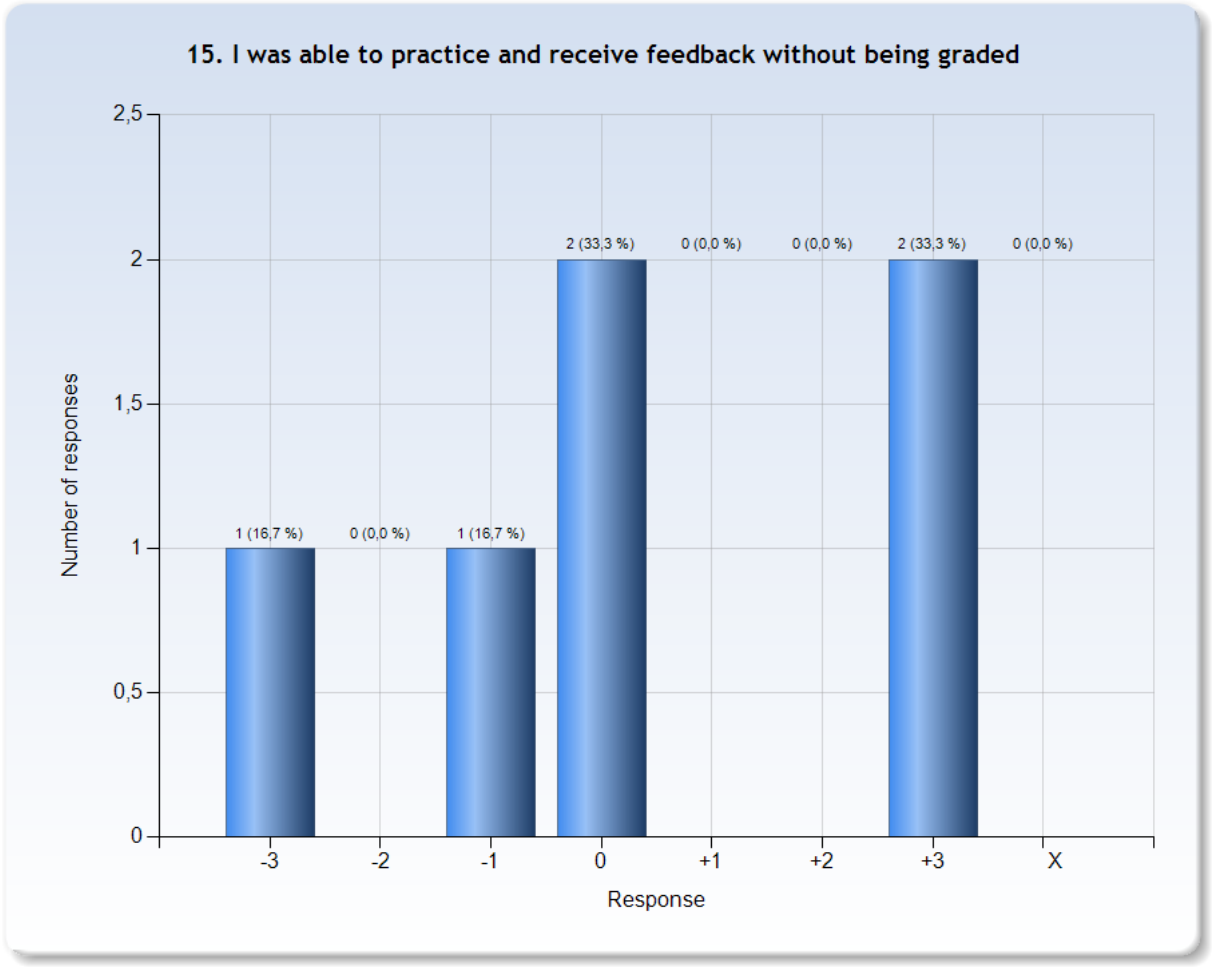

11. Understanding of key concepts had high priority
3,5
3
2,5
2
1,5
1
0,5
0
Number of responses
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
3 (50,0 %)
3 (50,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments

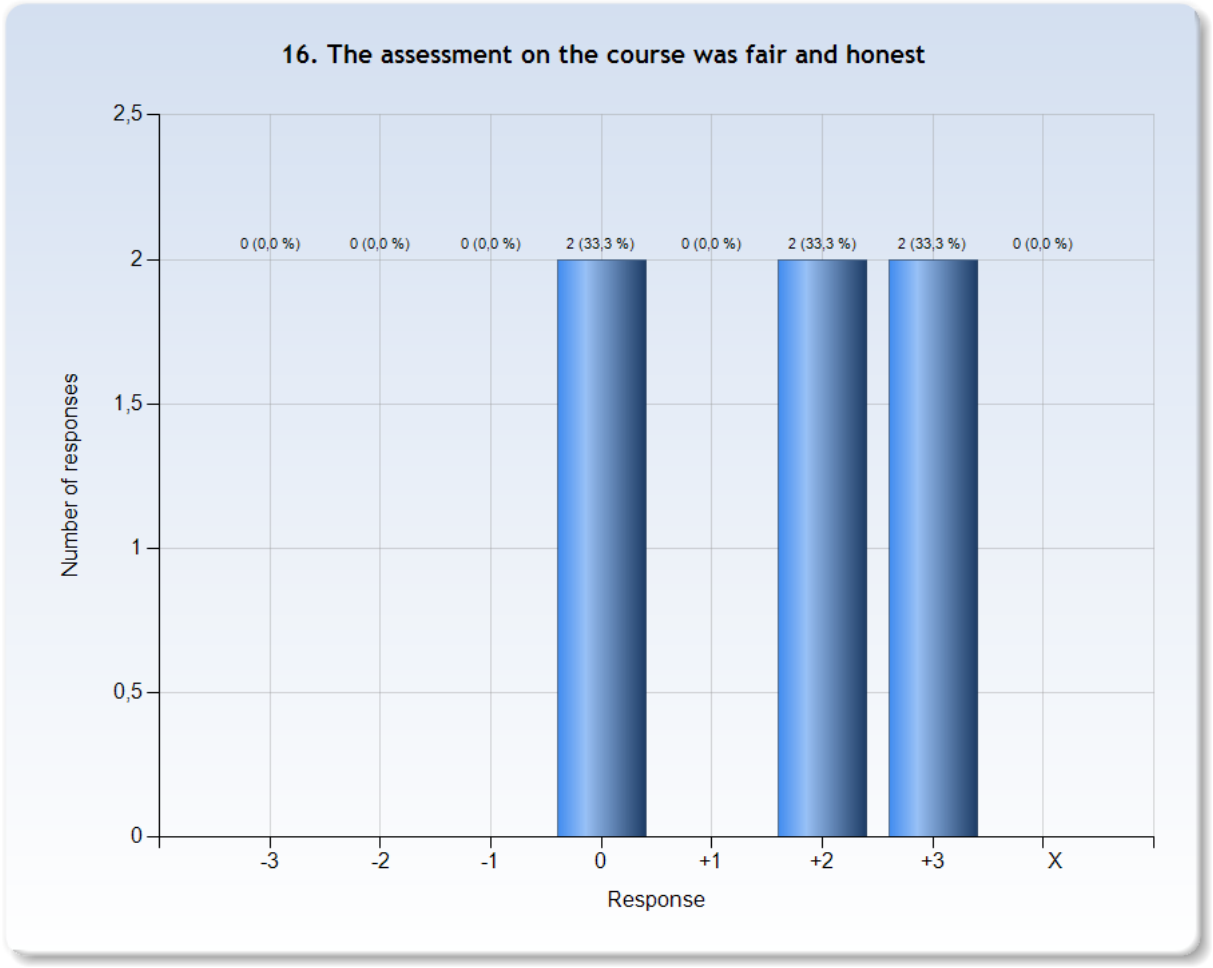
12. The course activities helped me to achieve the intended learning outcomes efficiently



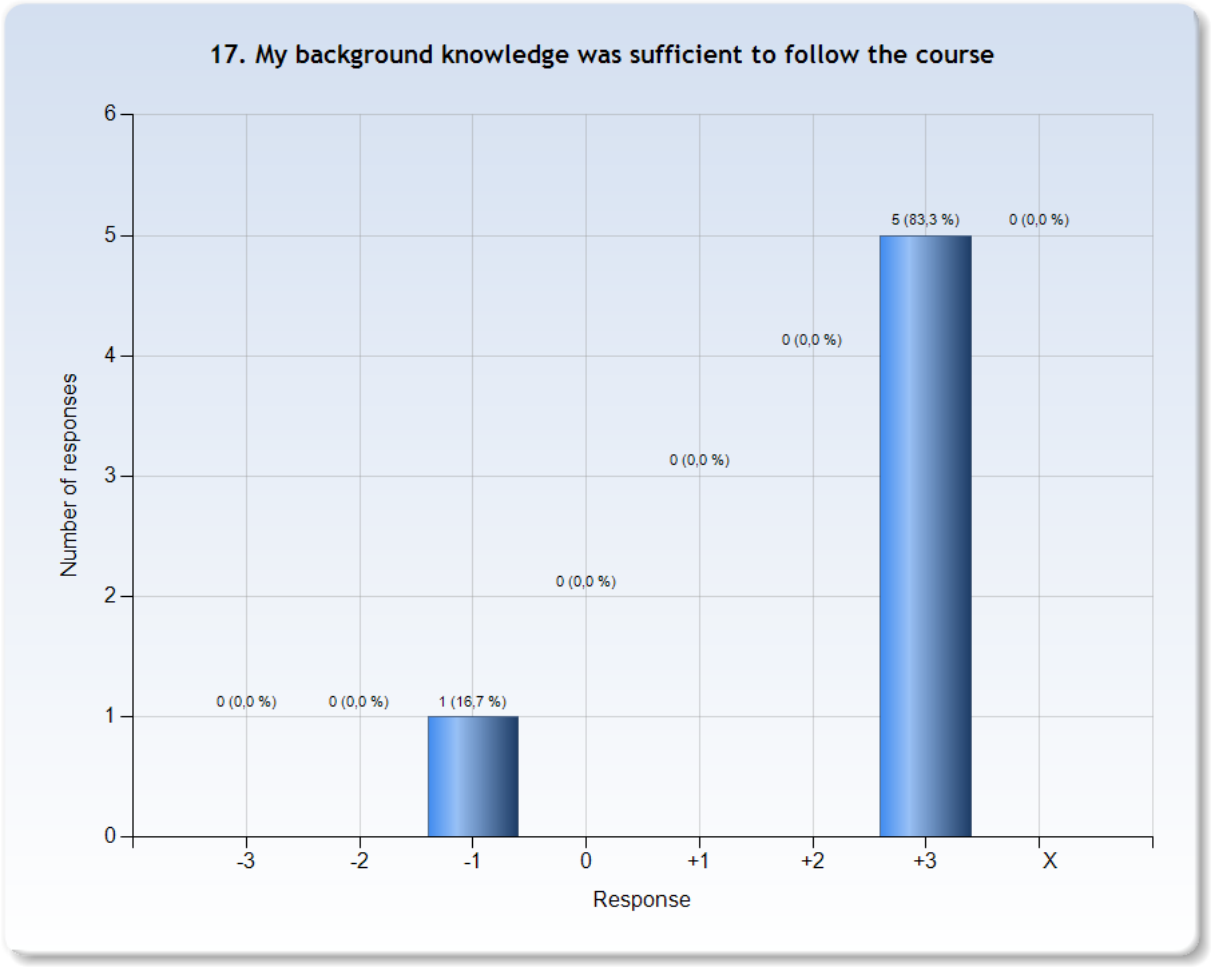
Comments


15. I was able to practice and receive feedback without being graded
Number of responses
2,5
2
1,5
1
0,5
0
1 (16,7 %)
0 (0,0 %)
1 (16,7 %)
2 (33,3 %)
0 (0,0 %)
0 (0,0 %)
2 (33,3 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

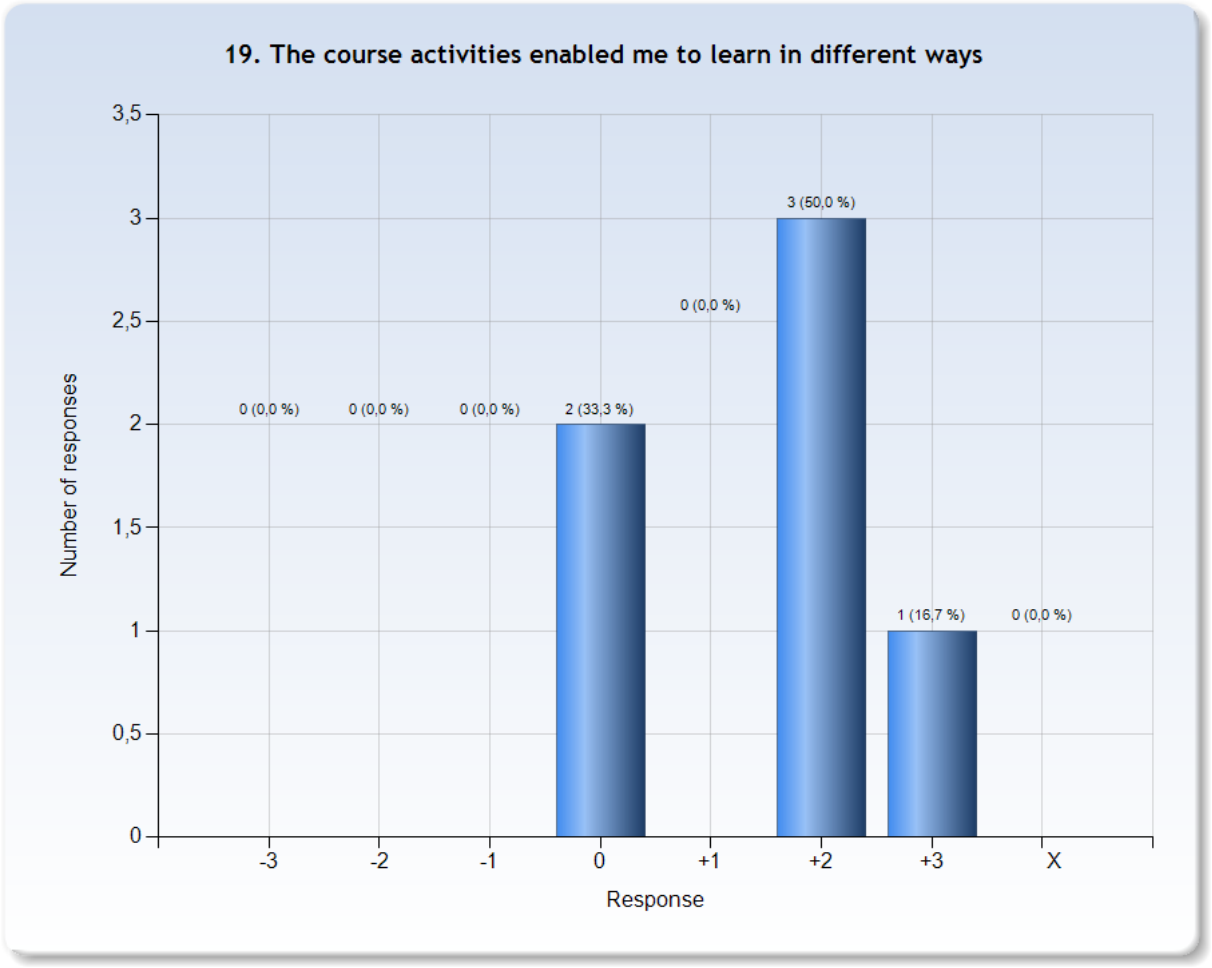
Comments


16. The assessment on the course was fair and honest
2,5
2
1,5
1
0,5
0
Number of responses
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
2 (33,3 %)
0 (0,0 %)
2 (33,3 %)
2 (33,3 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

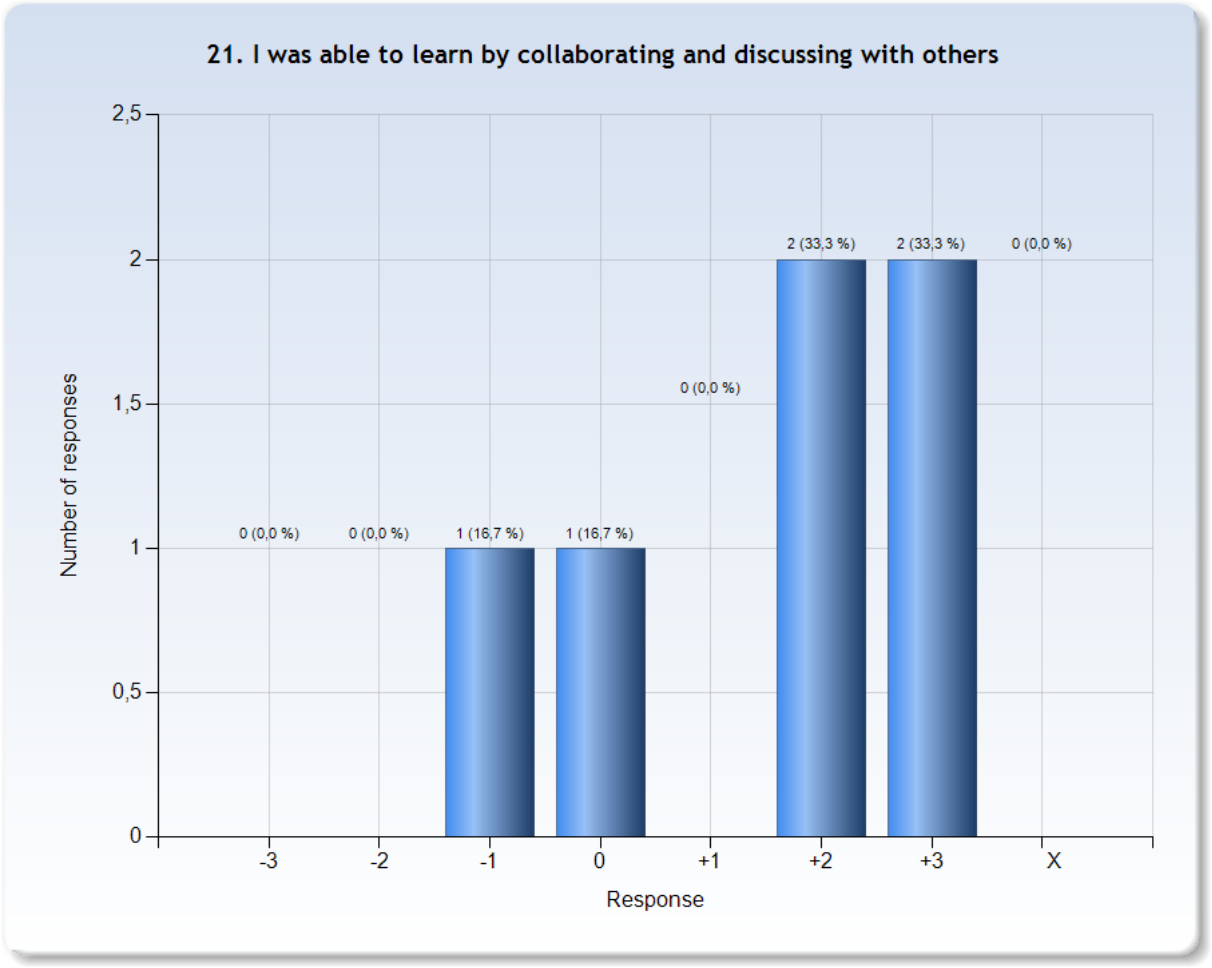
Comments


17. My background knowledge was sufficient to follow the course
Number of responses
Response
0
1
2
3
4
5
6
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
1 (16,7 %)
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
5 (83,3 %)
0 (0,0 %)

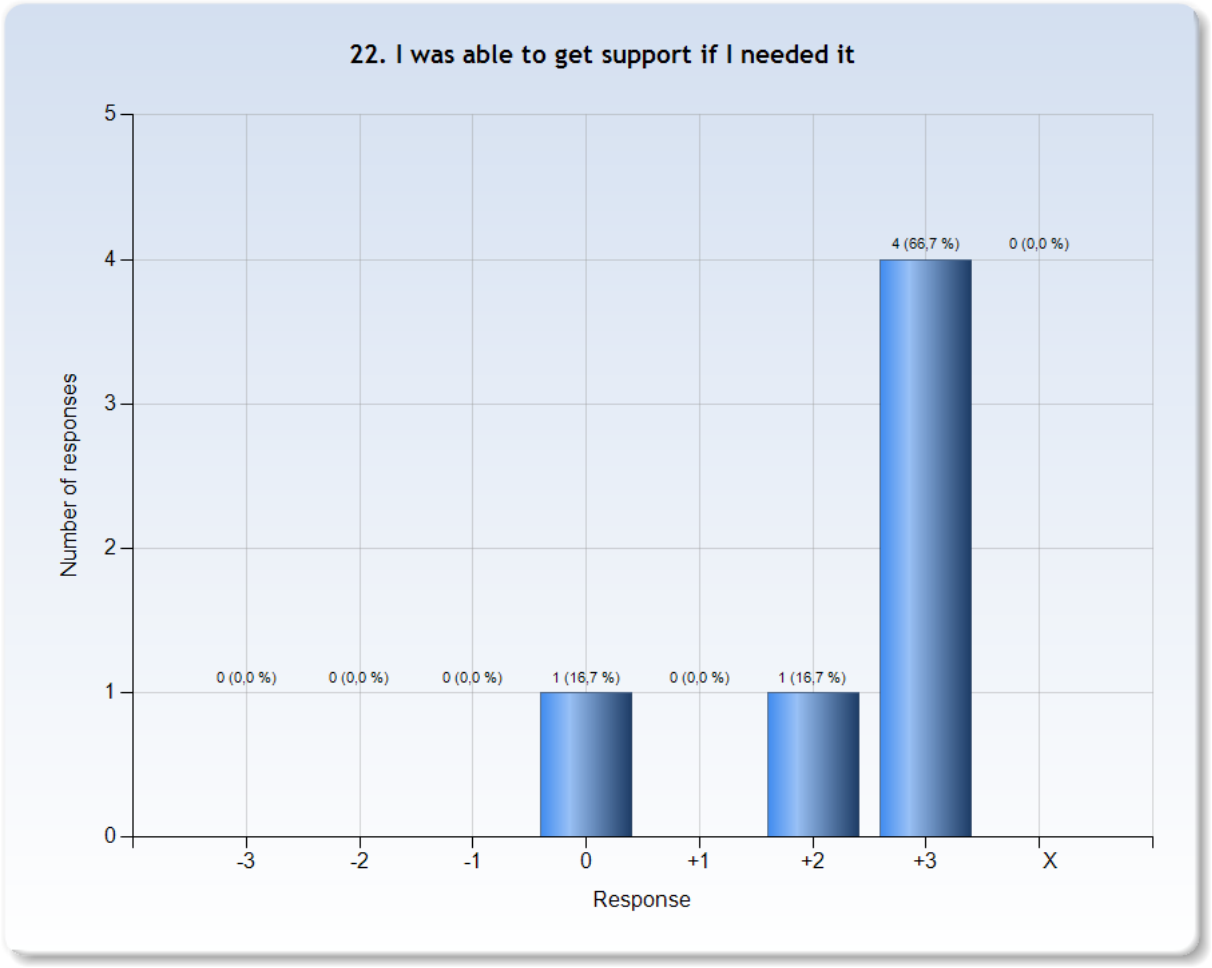
Comments


19. The course activities enabled me to learn in different ways
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
2 (33,3 %)
0 (0,0 %)
3 (50,0 %)
1 (16,7 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments


21. I was able to learn by collaborating and discussing with others
Number of responses
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
1 (16,7 %)
1 (16,7 %)
0 (0,0 %)
2 (33,3 %)
2 (33,3 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments


22. I was able to get support if I needed it
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
1 (16,7 %)
0 (0,0 %)
1 (16,7 %)
4 (66,7 %)
0 (0,0 %)

Comments