

Report - EL2520 - 2024-08-13

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):

Elling W. Jacobsen, jacobsen@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 course evaluation was mainly carried out with an online survey. Invitation to the survey was sent out after the final exam, with repeated invitations to those who did not take the survey.

During the course the students were also given the opportunity, and encouraged, to give feedback through the course homepage, through email to the course responsible and in personal meetings with the course responsible.

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.)

Meetings with students mainly took place in the lecture hall. Feedback from the students were invited and also received both during lectures, in breaks and through discussion groups on the course homepage in Canvas.

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 14 lectures, 10 exercises, 4 computer lab assignments in groups of 2 students with hand-in, and one lab project in groups of 4 with hand-in. The grade is based on a final written 5h exam.

THE STUDENTS' WORKLOAD

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

Most students report between 15 and 20 hours per week which seems reasonable given that it is a 7.5 credit course. Some students report more, others less for various reasons.

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?

We had a record number of students this year (approx 120 students of which 108 wrote the exam), but still mostly very strong and highly motivated students. The results on the first exam were very good with 15% A, 24% B, 21% C, 14% D, 6% E and 20% F/Fx.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

Overall the students appear to be satisfied or very satisfied with the course content and the teaching. The main criticism concerned the final lab and can probably be at least partially attributed to some technical problems with the lab equipment this year. The problems have now been fixed and should not appear next year.

SUMMARY OF STUDENTS' OPINIONS

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

Overall very positive response.

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.

We had very many highly motivated students this year and so teaching the course was a joy. The final results on the course reflected this with many students obtaining high grades. The main changes of the course over the last 2-3 years has been going back to face-to-face teaching only, leaving both live Zoom meetings and video recordings out. In fact, this year we did not provide any links to previously recorded lectures until one week before the exam with the result that most students came to the lectures in which we had a good two-way communication. We have also written lecture notes, summarising each lecture and complementing the course book, and these are highly appreciated by the students.

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?

Difficult based on the relatively few answers on the survey.

PRIORITIZED COURSE DEVELOPMENT

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

Improving the final project.

EL2520 - 2024-06-02

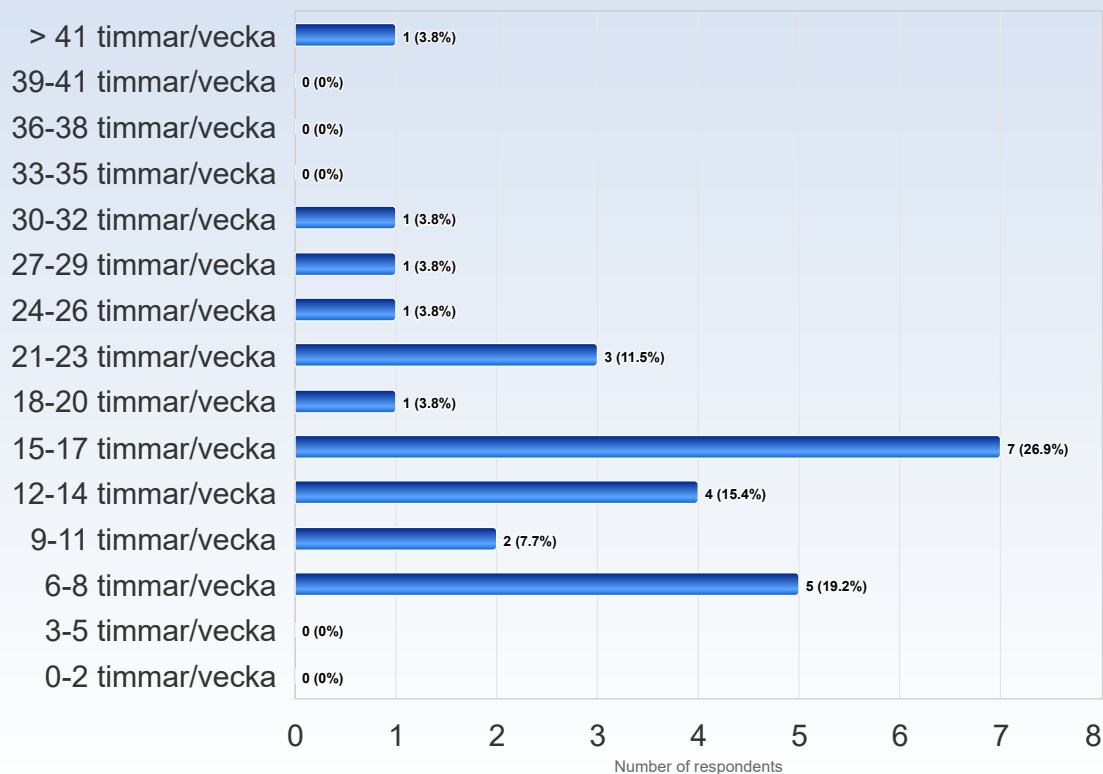
Antal respondenter: 128

Antal svar: 28

Svarsfrekvens: 21,88 %

ESTIMATED WORKLOAD

On average, how many hours/week did you work with the course (including scheduled hours)?



Comments

Comments (I worked: 6-8 timmar/vecka)

Can't learn too much from exercise courses because of very low voice and small writing.

Due to other courses taking too much of the time, upwards of 40 hours some weeks, this course took the hit.

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

A reasonable workload.

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

The lab equipment needs replacement. a lot of them are not working properly. It made the lab experience tiring.

Comments (I worked: 27-29 timmar/vecka)

A lot of work solving the exercises

Comments (I worked: 30-32 timmar/vecka)

This course is fast and has many homeworks. It is necessary to keep up and try to study each day.

LEARNING EXPERIENCE

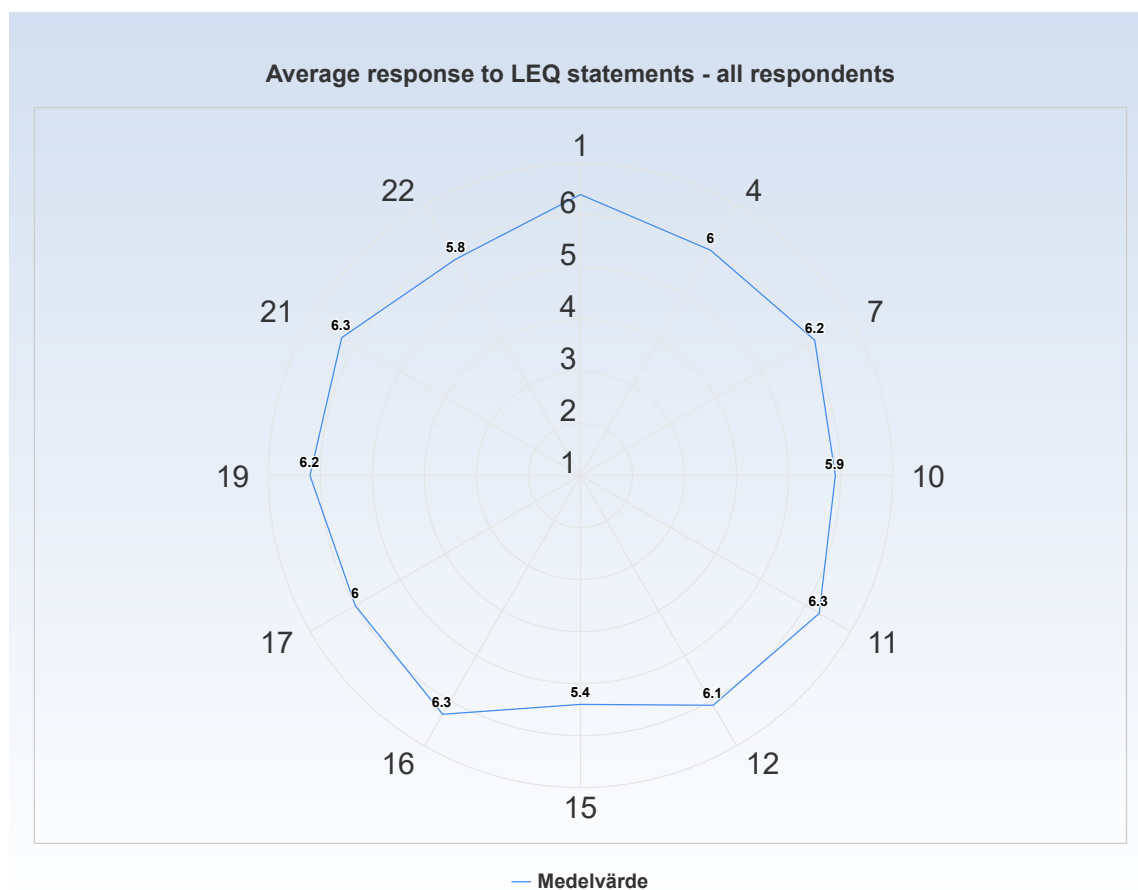
The polar diagrams below show the average response to the LEQ statements for different groups of respondents (only valid responses are included). The scale that is used in the diagrams is defined by:

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.

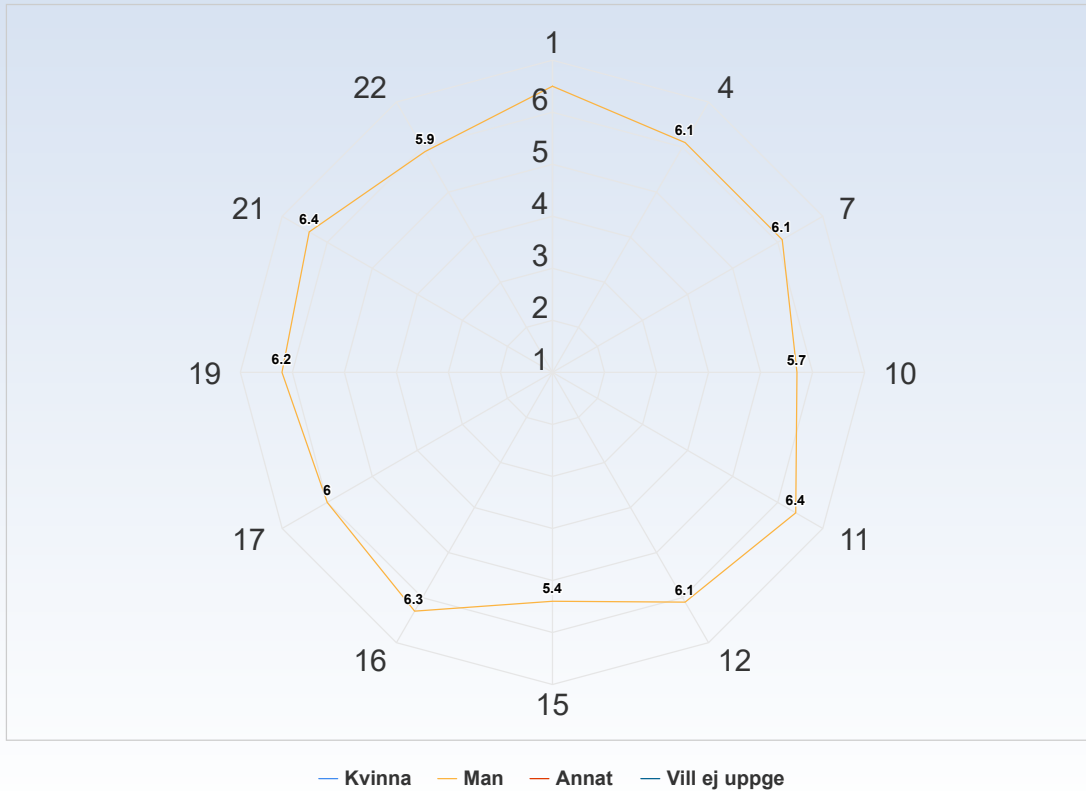
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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.

Average response to LEQ statements - per gender

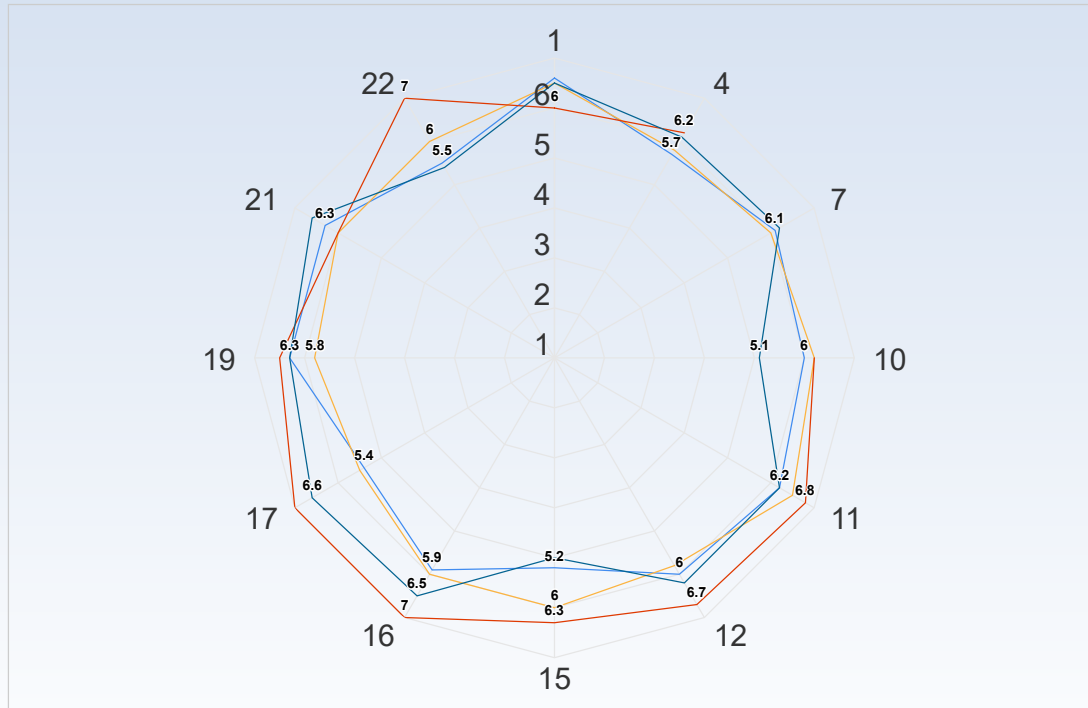


Comments

Comments (I am: Man)

The course seems interesting and how to solve them is interesting. There seems to be a good mix of male and female so I didn't notice anything big from this perspective.

Average response to LEQ statements - per type of student



- Internationell masterstudent
- Svensk student i årskurs 4-5
- Internationell utbytesstudent
- Annan typ av student
- Svensk student i årskurs 1-3
- Vill ej uppge

Comments

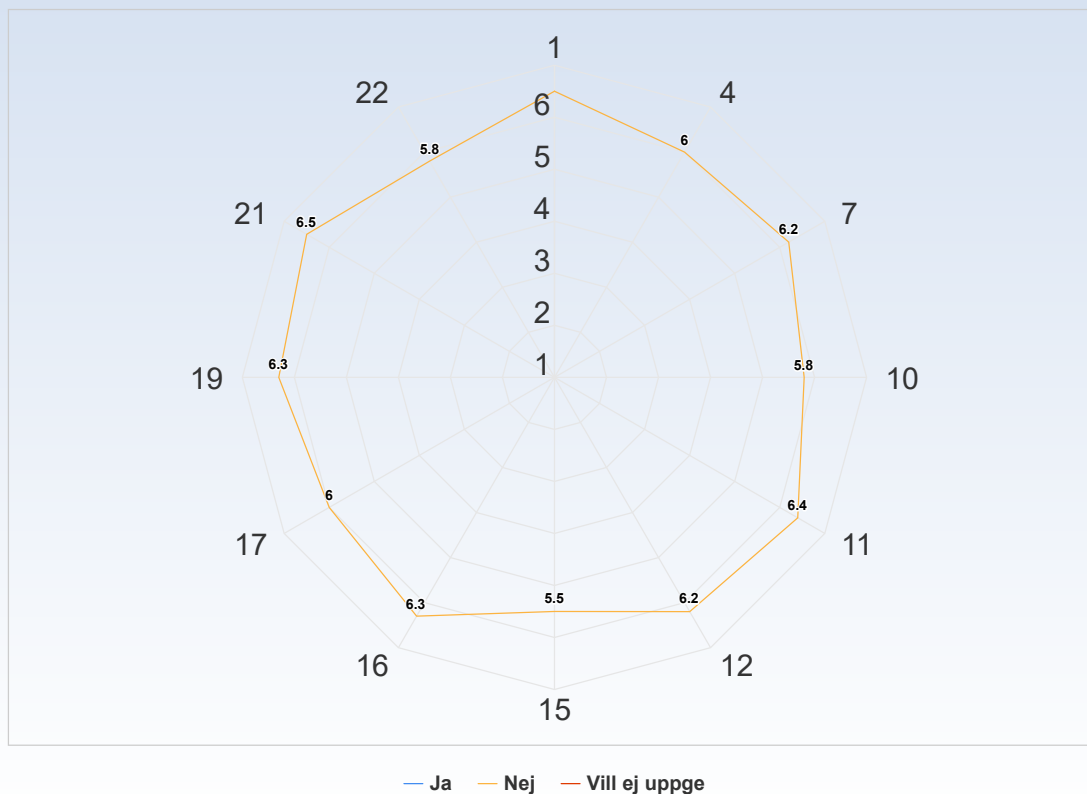
Comments (I am: Internationell masterstudent)

Some of the topics that were assumed to be taught in the basic control course were not covered in my Bachelors basic control course. This was also the case for several other international masters students.

Comments (I am: Svensk student i årskurs 4-5)

This course seems to be in line with other courses at KTH and fit my programme in electrical engineering.

Average response to LEQ statements - per disability



Comments

Comments (My response was: Ja)

Hearing aids

Comments (My response was: Nej)

This course can be hard and there is many details to pay attention to. To me it helped to read again and do lots of repetition.

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 6-8 timmar/vecka)

Good lectures. I did not attend all of them but the ones I went to I found interesting and Elling was very good at explaining new and complicated concepts in a good way.

Interesting concepts which dove deeper into control

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

Jag tycker föreläsningarna var bra. De gick igenom allt man behövde tydligt så att man förstod.

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

the lectures of the optimal control (lec. 7-12) were very interesting

I enjoyed the lectures and computer exercises

The structure, doing SISO first and then MIMO, works well. Also, the lecture notes and the numerous old exams make it clear what one is expected to know.

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)

The organisation of the course, the content and the resources used to grasp the concepts are good.

Elling is a really good educator, focusing on main concepts and constantly refreshing earlier parts of the course. Also, working on the black board and not just breezing through slides is a huge bonus.

Kul frågeställningar och problem att räkna på, bra labbar som var lärorika.

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

I enjoyed the content of the course.

What was the best aspect of the course? (I worked: 27-29 timmar/vecka)

The lectures, clearly explained concepts well.

What was the best aspect of the course? (I worked: 30-32 timmar/vecka)

The lectures. It was good and kept me interested in the course.

What would you suggest to improve?

What would you suggest to improve? (I worked: 6-8 timmar/vecka)

The water tank lab. Almost none of the hardware worked which made it quite difficult to know what you were doing. In our case one of the pumps did not work as it should have the second time we were in the lab. None of the water depth sensors worked correctly and thus even if the system was controlled the measured water levels were not even close to the same as the ones in the tanks.

The project lab was a caos. Instructions could be improved and there was also a LOT of problems with some tanks.

The last lab with the water tanks need to get "renovated". Half of the plants does not work from the beginning or breaks midway through

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

Jag tycker det skulle varit tydligare att man skulle ha gjort färdigt labb 4 innan man gjorde projektet, eftersom det krävdes.

Det hade kanske också varit bra om det fanns mer övningsuppgifter. Däremot kanske det inte är superviktigt eftersom det finns många gamla tentor ändå att öva på.

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

make the final lab shorter or place it earlier in the period, i.e. after completing lab 2 having the first session and one more session before the end of the period as it is now

Personally, I found the four-tank process rather boring as a project. Also, I would have preferred if it was a bit earlier in the course. Now the writing of the report and exam preparations had to be done simultaneously.

What would you suggest to improve? (I worked: 15-17 timmar/vecka)

The exercise session carried out by the TAs could be improved. During some sessions, one of them simply wrote down the solution to the exercise without explaining why we were doing this or that, or doing the calculations (some can be skipped, but not all). The laboratory wasn't very good either because of problems with the processes. Some of them didn't work properly during the first session for the first groups!

The project was a little frustrating as the tanks not always work as intended. Maybe a note on what results are reasonable would be good, so we would not try to get our controller to work for hours only to realise that it is not possible.

The final lab project's water tanks were horrible to work with because they weren't reliable. Me and my group had problems with the sensors, the motors and the holes and it was kind of a nightmare to work with.

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

The final project is outdated and disorganized. The project should be updated, since it was initially introduced in 1999 and many of the tanks have issues (that cannot simply be fixed by the TAs).

What would you suggest to improve? (I worked: 27-29 timmar/vecka)

The lab. We wasted 4 hours the first session where none of the lab stations worked properly & were forced to start from scratch the next session. If the lab equipment doesn't work it should either be cancelled or repaired before students arrive. It's the course organizers responsibility to check that all equipment is working when they've booked in a slot for a lab session.

The exercise assistants didn't attend the computer labs as promised. What's the point of a 4 hour session when the lab assistant only stays a single hour? Sometimes he came back the last hour as well, other times he said so but never appeared and some he was a complete no show. In general it felt like it lowered motivation and made things more difficult than necessary due to this issue

What would you suggest to improve? (I worked: 30-32 timmar/vecka)

I would like more step by step solutions. The notes are good but sometimes it can be too advanced and simple things get left out.

What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 6-8 timmar/vecka)

Start to study at once. There are many difficult concepts to understand and you need time to do it.

Go to the lectures, they are good

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)

Se till att hänga med bra redan från början så du inte hamnar efter.

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

study regularly and do the computer exercises as soon as possible

Focus on understanding the basics, lectures 1-4, or the rest will be difficult to understand.

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)

Useful course which can be a good introduction to more complex control courses such as MPC, ...

We learn some useful tools that enable us to determine the fundamental limitations of a given system

Häng med från början och räkna själv!

What advice would you like to give to future participants? (I worked: 27-29 timmar/vecka)

Take help of friends when doing the lab & homework, it helped a lot

What advice would you like to give to future participants? (I worked: 30-32 timmar/vecka)

Study each day and try to keep up. Better to be too far ahead than too behind.

SPECIFIC QUESTIONS

RESPONSE DATA

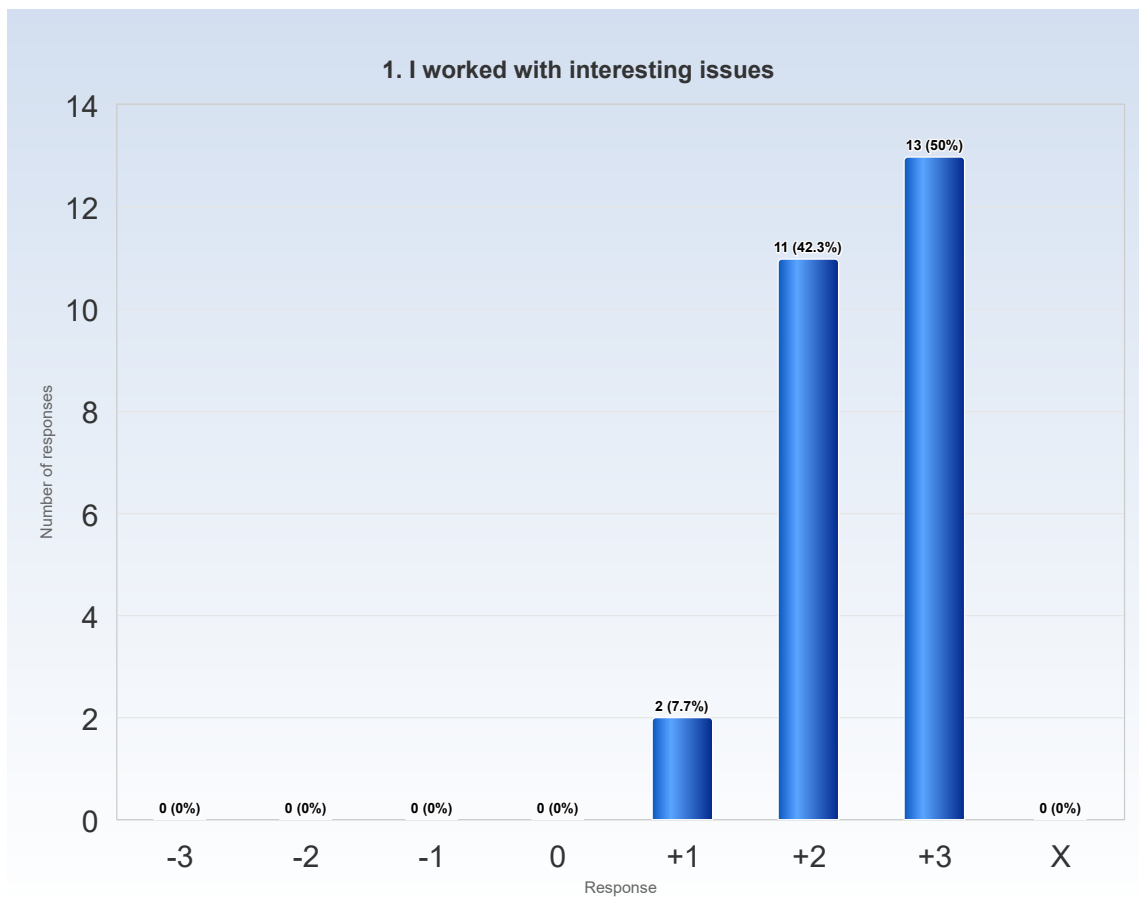
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-3 = No, I strongly disagree with the statement

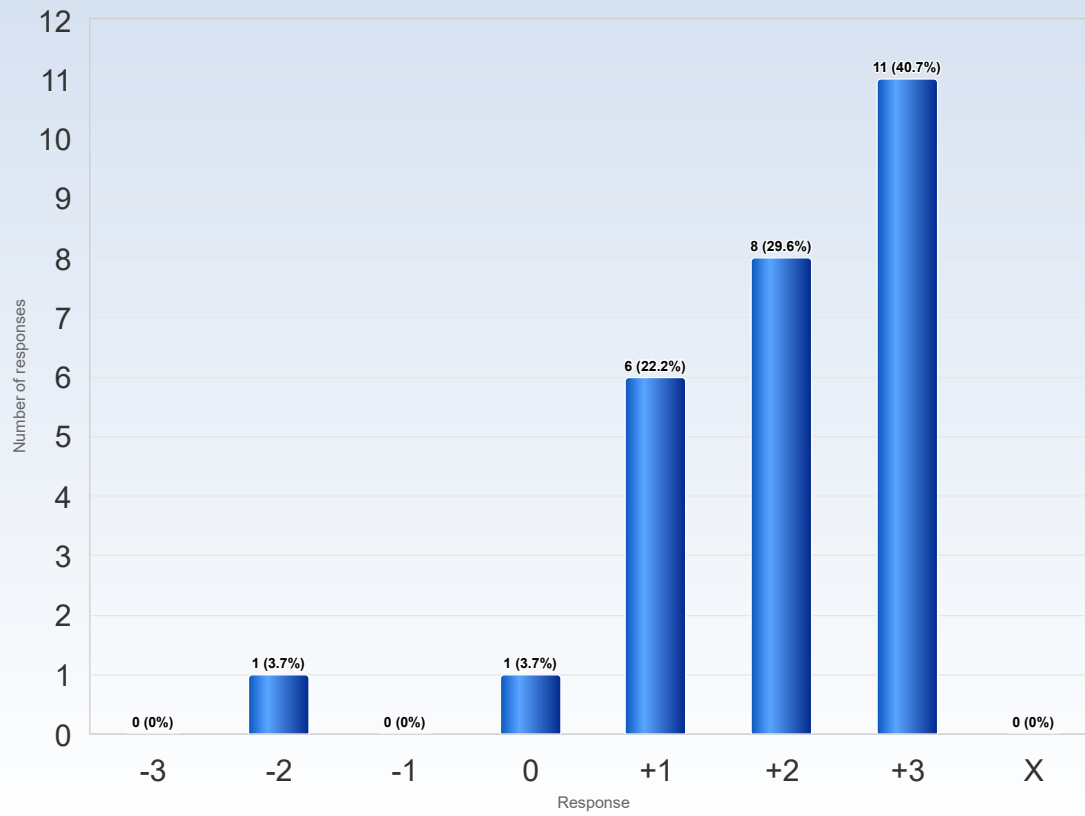
0 = I am neutral to the statement

+3 = Yes, I strongly agree with the statement

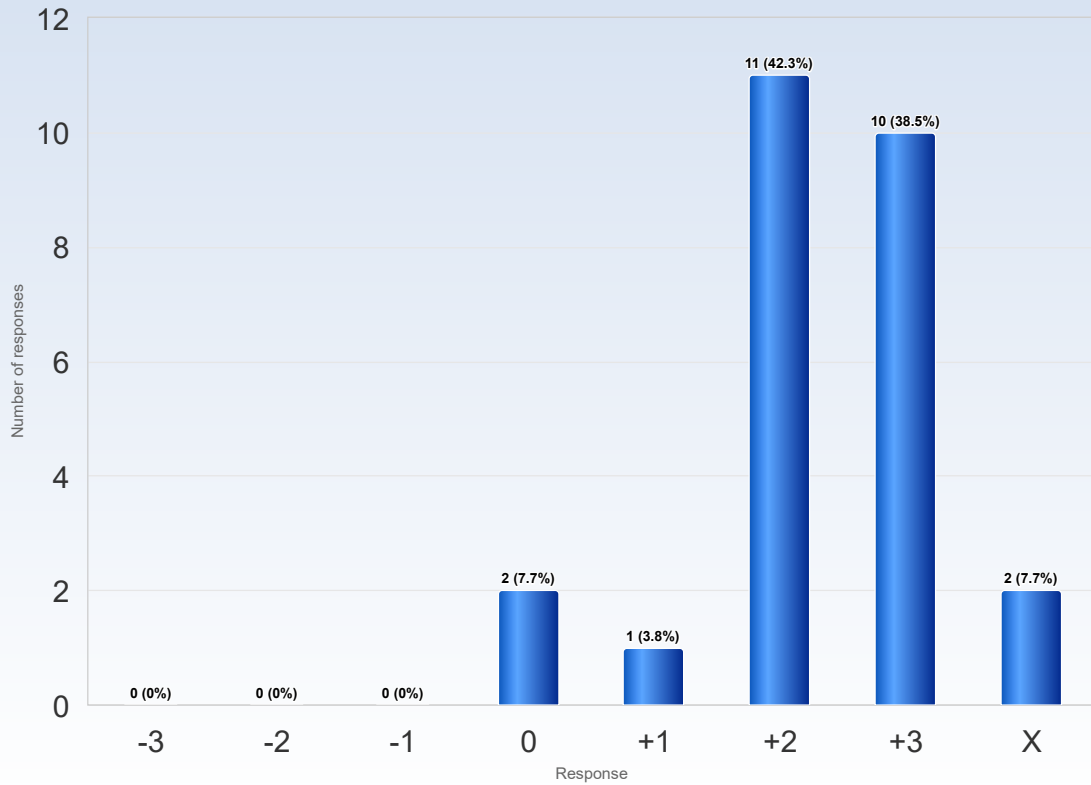
X = I decline to take a position on the statement



4. The course was challenging in a stimulating way



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



Comments

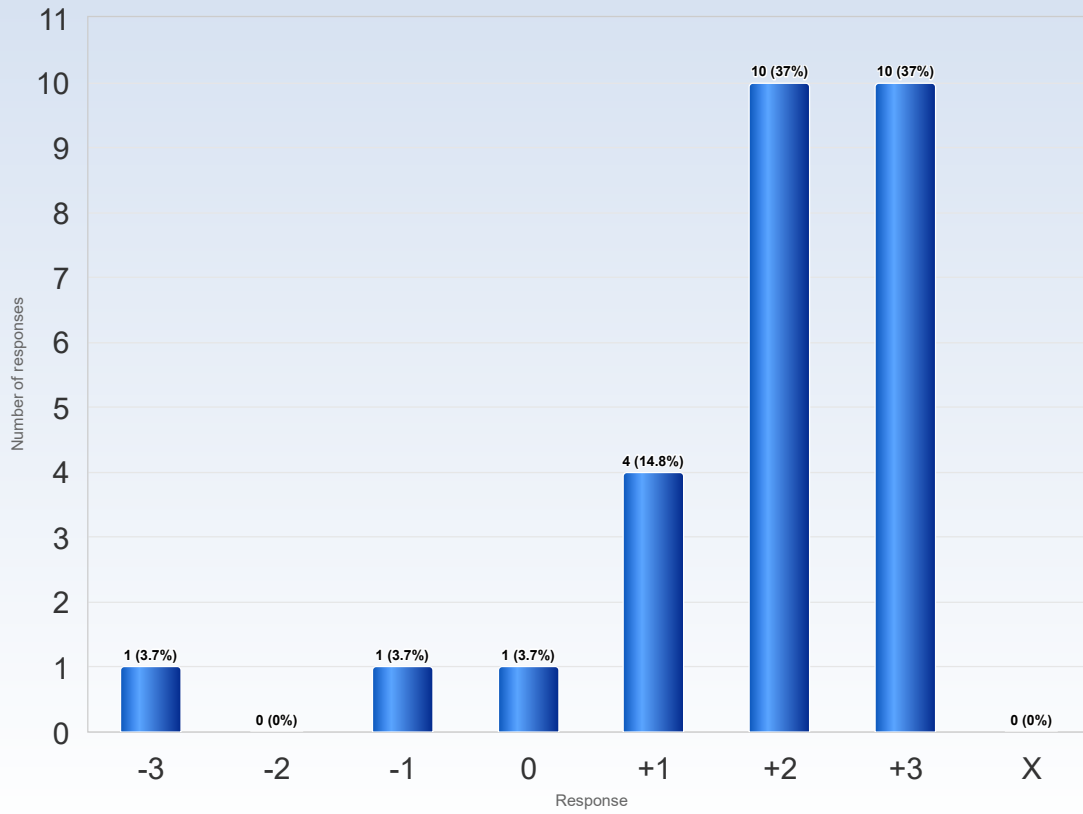
Comments (My response was: +2)

Some concept not so clear, computation details either

Comments (My response was: X)

Did not read the intended learning outcomes

10. I was able to learn from concrete examples that I could relate to

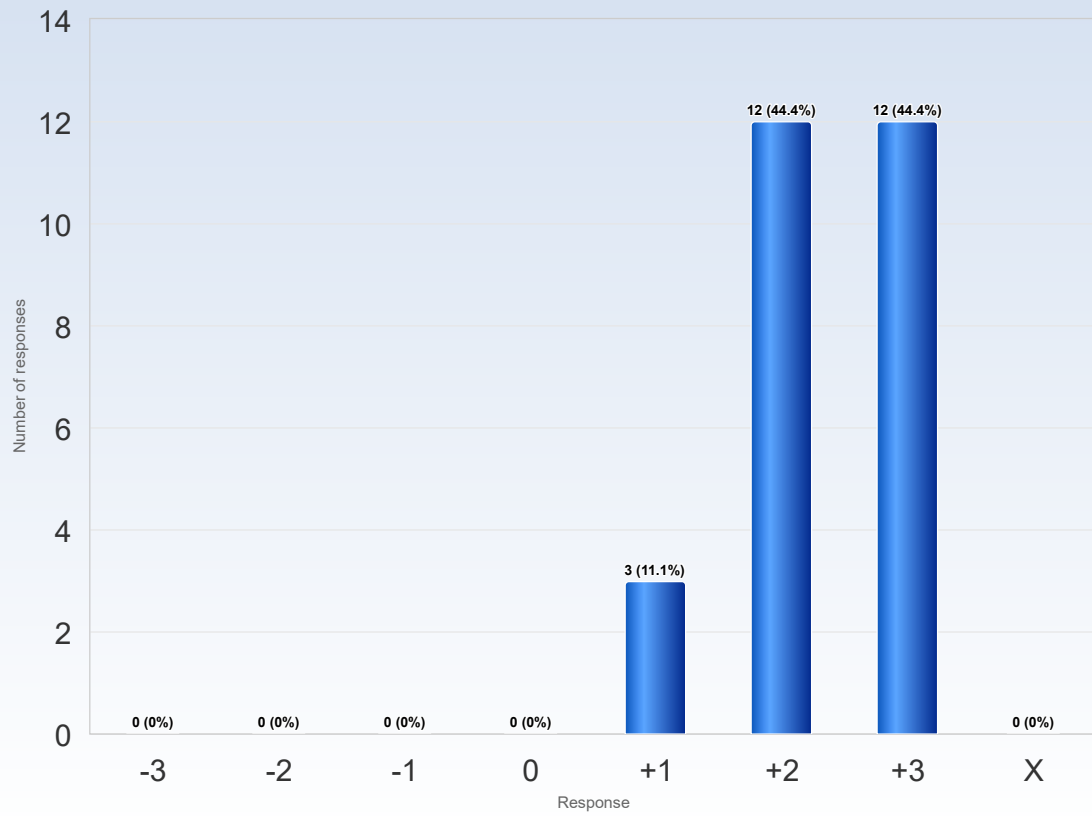


Comments

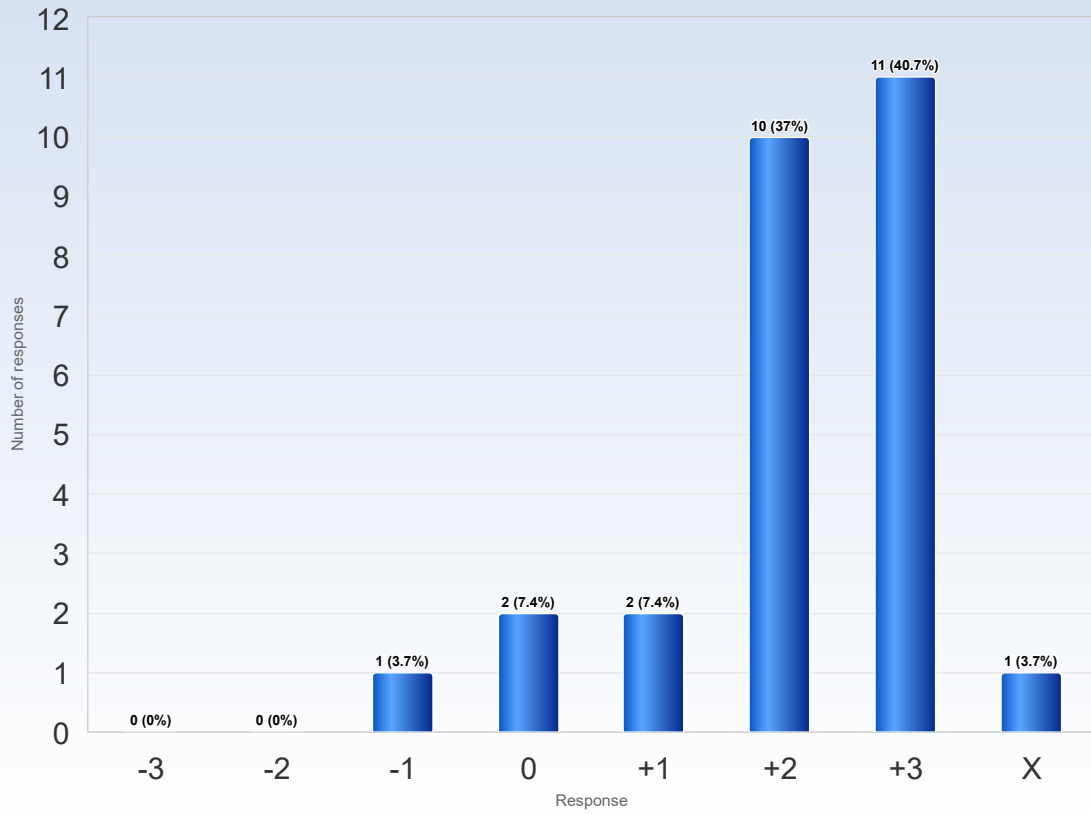
Comments (My response was: -1)

The labs were at times a bit abstract I think

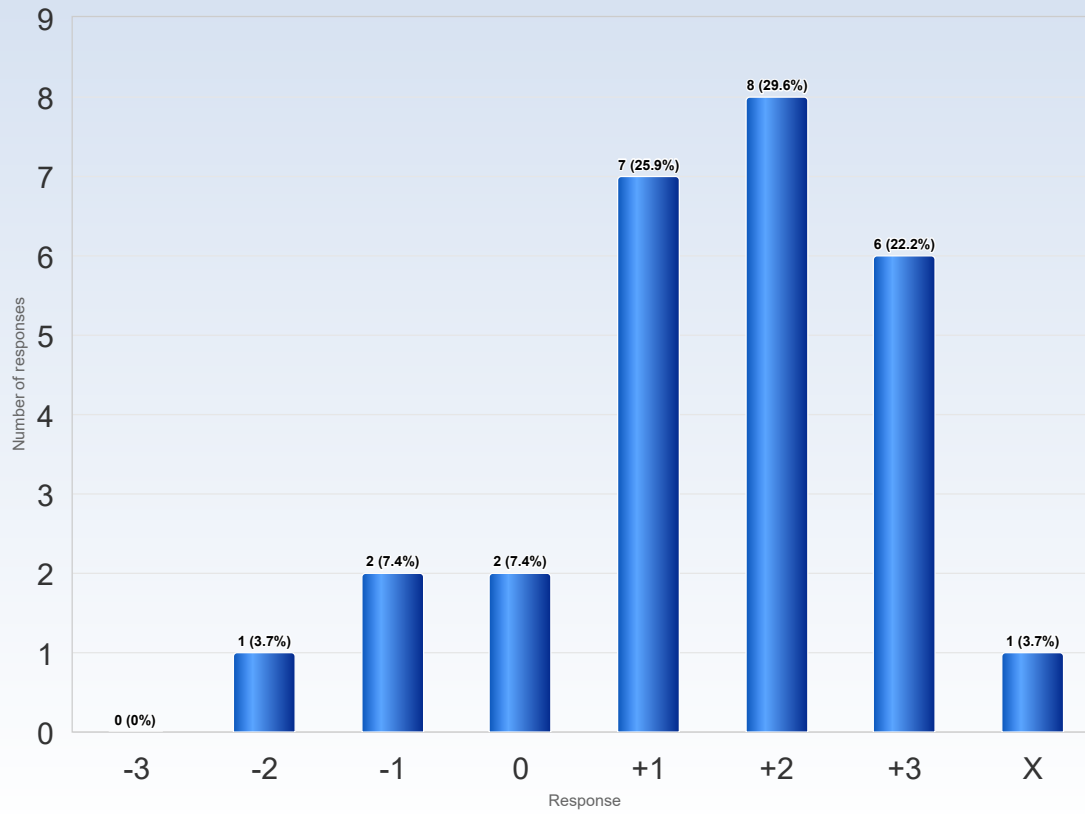
11. Understanding of key concepts had high priority



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



15. I was able to practice and receive feedback without being graded

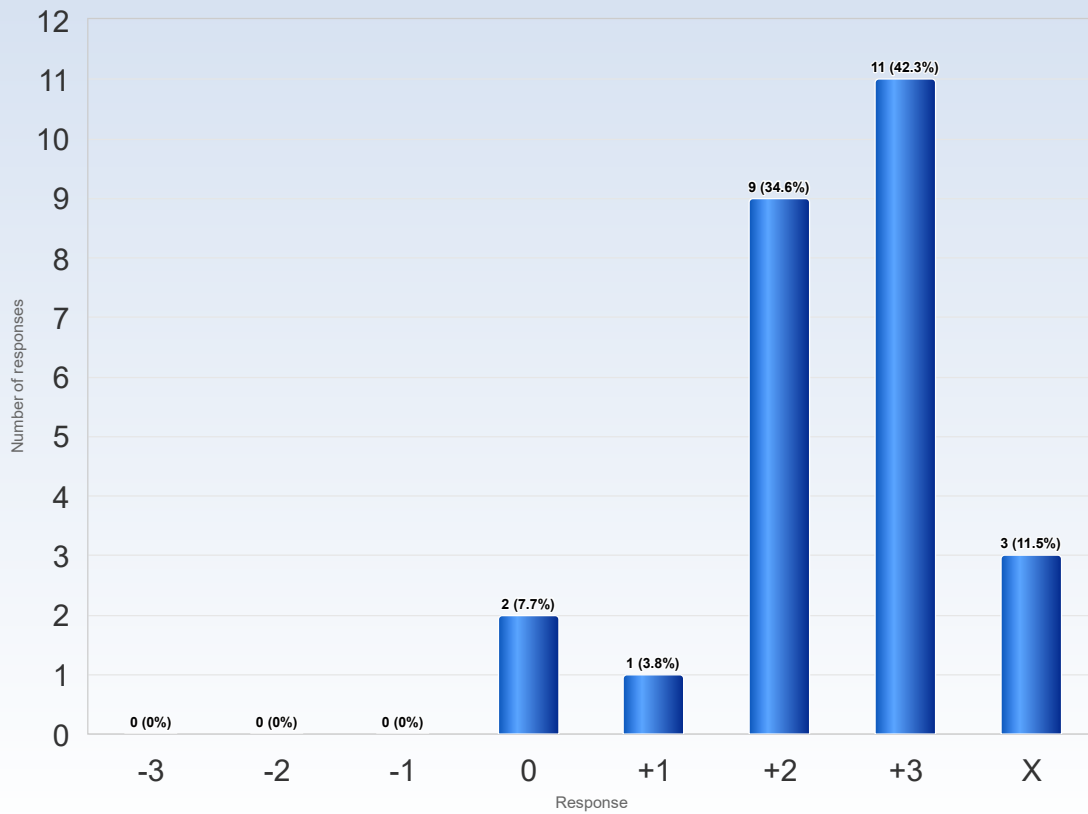


Comments

Comments (My response was: X)

I never attempted to receive feedback without being graded

16. The assessment on the course was fair and honest

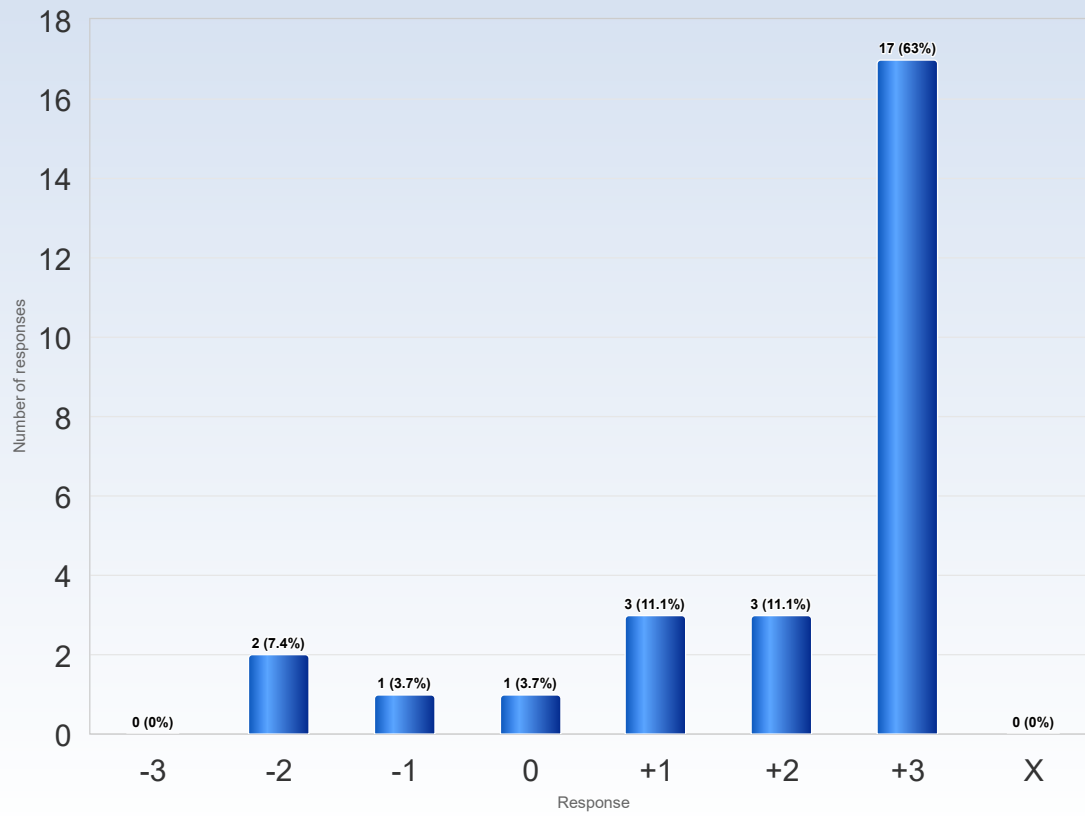


Comments

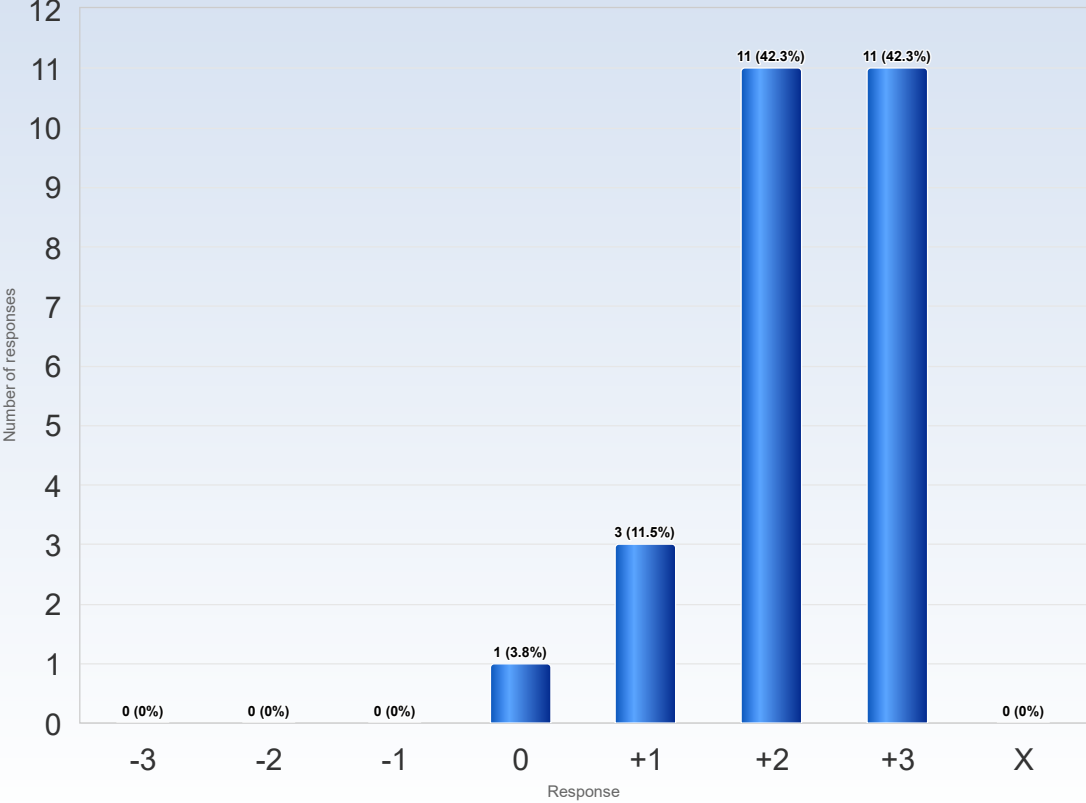
Comments (My response was: X)

Exam not graded yet

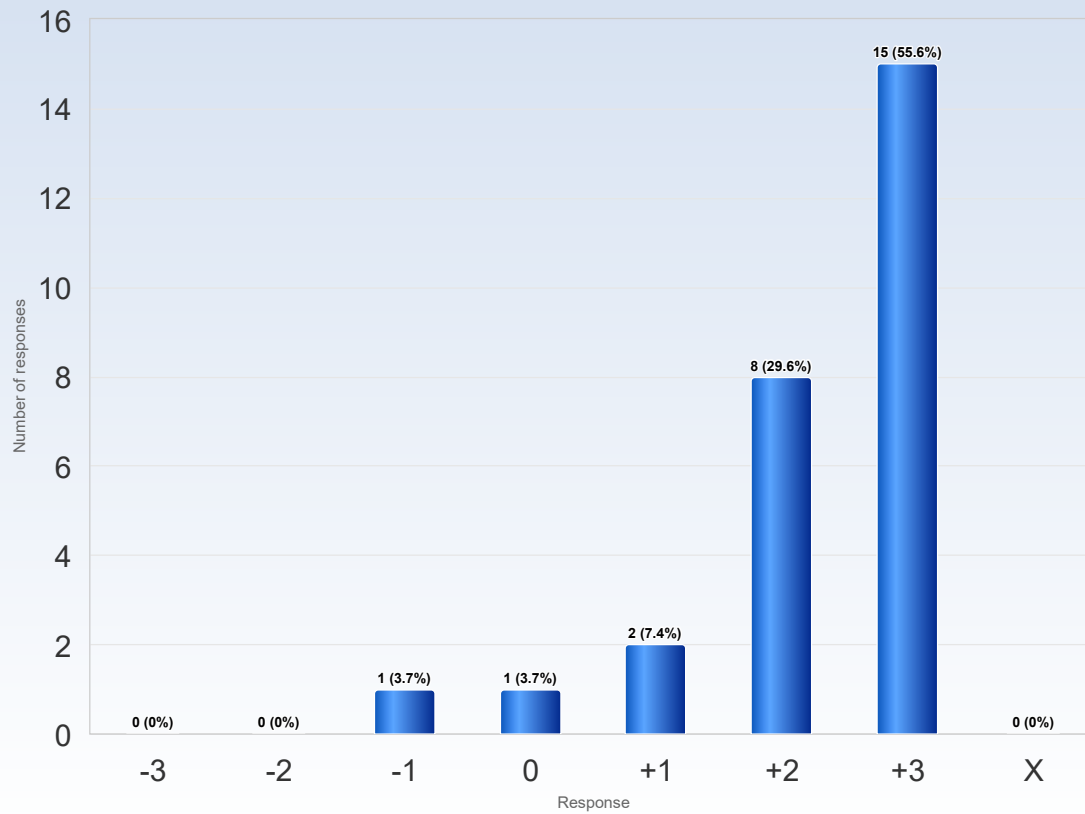
17. My background knowledge was sufficient to follow the course



19. The course activities enabled me to learn in different ways



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



22. I was able to get support if I needed it

