

DD1354 Models and Simulation

Course analysis and evaluation

6.0 credits: Lab (2.0), Project (3.0), Exam (1.0)

Students: 39; Completed: 27

Summary

More students took the course this year than in previous years. There were also some changes, as noted below, to the course team. While the content of the course did not change substantially from last year, the student experience is likely to have been quite different. Importantly, we managed to recruit a previous course student as TA.

As noted by one student, the course is viewed as an alternative to multivariate analysis, but this is not the case as it deals with different aspects, focussed on simulations and visualisation and is also more research-oriented in relation to the project, which students must specify themselves with support from the course team via specification feedback process. These courses work well together and we will continue to promote this when we talk to prospective students about the course.

COURSE CHANGES
There were changes to the course team this year. Especially, the previous Teaching Assistants (TAs), who are PhD students, had either graduated or were stranded abroad due to the epidemic. This year, we had the help of a TA who took the course themselves as a student last year.
The MOOC element of the course was made optional. In previous years, we received several different feedback comments in relation to the MOOC.
Due to very low response rate to the course analysis last year, this year we asked students to submit the questionnaire when they submitted their final assignments in the course. This worked well and led to a much better response rate.
Opened Canvas earlier for preliminary (partial) lab submissions to allow formative feedback in relation to report contents. This worked well and also reduced the number of revision requests made in the final submission stage of the course.

STUDENT RATINGS OF LEQ ITEMS
Most ratings were either near or above 6.0/7.0.
Ratings below 6.0 related to 7. ILOs helped me understand what I was expected to achieve (5.5), 12. Course activities helped achieve ILOs (5.6), 11. Understanding key concepts had high priority (5.7) and 4. Course challenge level (5.8).
This year, there were comments regarding the challenge level, especially in relation to the labs. Graph 4. "The course was challenging in a stimulating way" suggests that this was a minority of students, but also in general it related primarily to the labs and not the project.
All students agreed that they worked with interesting topics, however it was not always clear how they related to the ILOs.

SUGGESTED IMPROVEMENTS	
<i>Your comments</i>	<i>Our feedback</i>
Increase the challenge level of the labs	The labs are primarily intended as scaffolding for the project, which is the central part of the course. However, they are popular and for some they finish too soon. We will consider extending them in relate to their math content (see note below).
Make links to the ILOs clearer	We continue to try to better merge the numerical analysis aspects of the course with the real-time graphics. We will attempt to do this better via improvements to the lab documentation and extension of the lab questions to clarify the links to the ILOs.
In the page about the project, write a bit more info about what you expect from an advanced project or a pass grade project.	We provide exemplars of previous projects and specifications. Beyond the descriptions of the project grading criteria, we really encourage you to participate in the project specification process. We will try to make it clearer what the level of achievement is needed in relation to the sophistication of the algorithm, but since each project is unique (you get to choose your topic), direct and iterative feedback from the course team is always the best method for figuring out what needs to be done. We set up plenty of lab sessions to provide the opportunity to do that, in addition to the specification process.

ADVICE TO FUTURE PARTICIPANTS	
<i>Your comments</i>	<i>Our feedback</i>
Think about project ideas early in the course, start the lab and project work early	This is a frequent comment and one we remind the students of every year. We strongly encourage this. We note that since it is difficult to formulate feasible ideas for a subject that you are new to, you should follow our recommended method: iterative, incremental development of a project specification with feedback from the course team. Start off by talking to the teacher about your general project idea!

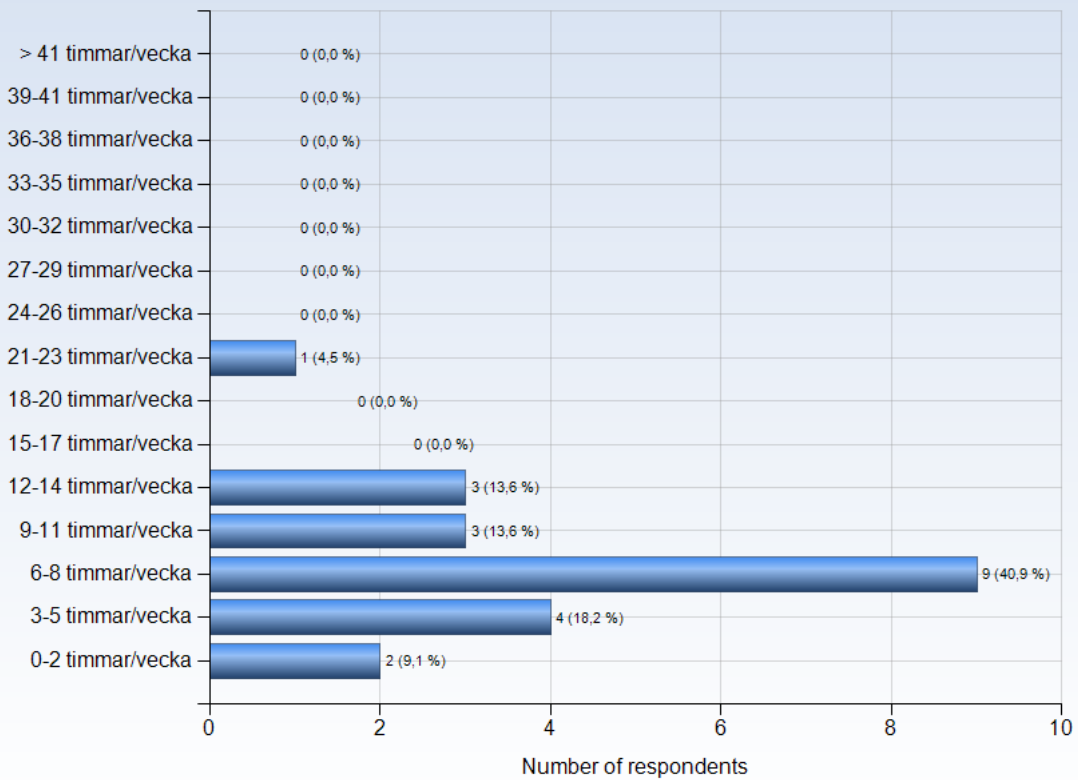


DD1354 - 2020-03-09

Antal respondenter: 41
Antal svar: 22
Svarsfrekvens: 53,66 %

ESTIMATED WORKLOAD

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



Comments

Comments (I worked: 0-2 timmar/vecka)

Krävde inte mycket arbete. Enkel kurs

Comments (I worked: 3-5 timmar/vecka)

Var ganska lite arbete men kul.

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

Labbarna tog inte alls mycket tid, så det var skönt att kunna fokusera på projektet

Lagom chill kurs, som inte krävde allt för mycket av mig.

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

Väldigt varierat. Under mitten på kursen är det mest eget labbarbete och enstaka föreläsningar, så då skulle jag gissa att jag satt ca 6-10 timmar i veckan med kursen. Dock satt jag betydligt längre innan till exempel projektlämningen och labblämningarna för att göra klart allt jag hade kvar. Under dessa veckor satt jag säker 15-18 timmar minst.

Would have liked even more lab sessions

Comments (I worked: 21-23 timmar/vecka)

A lot of time on the project



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:

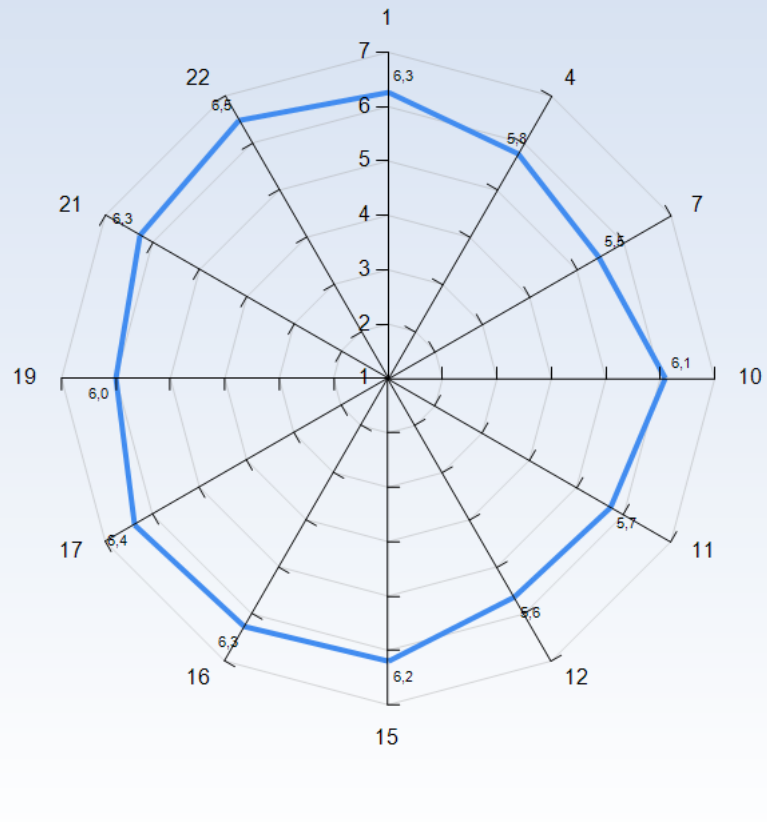
1 = No, I strongly disagree with the statement

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





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.

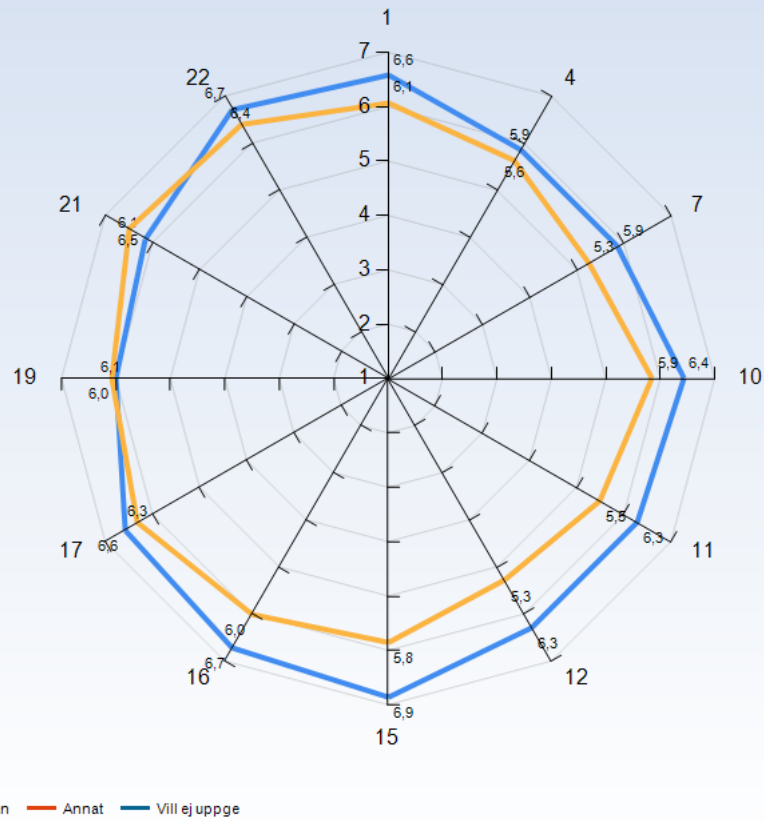
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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.

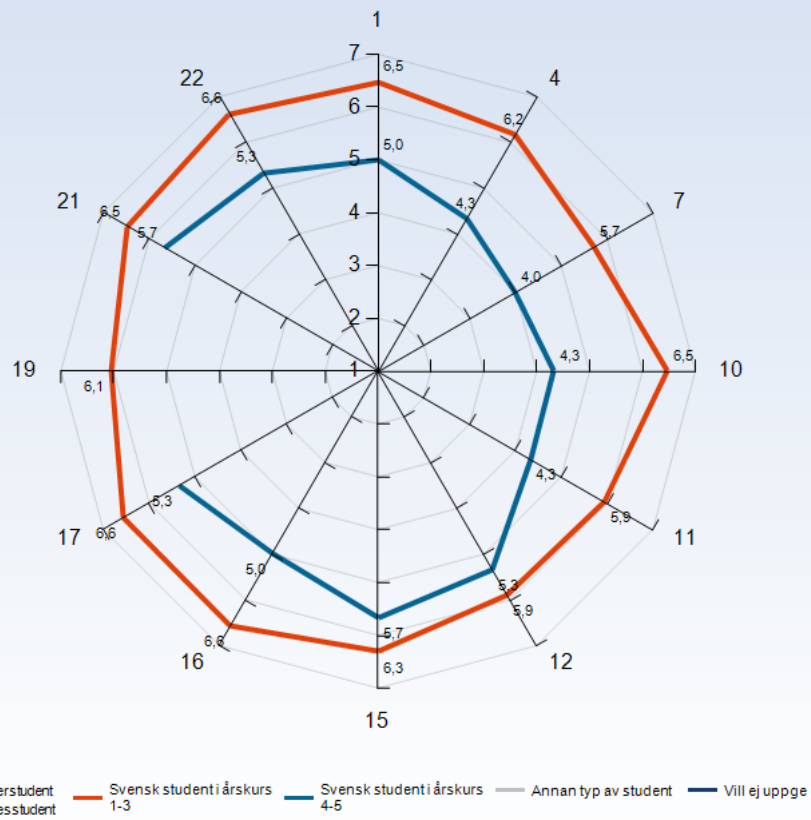
Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.

Average response to LEQ statements - per gender



Comments

Average response to LEQ statements - per type of student



Comments

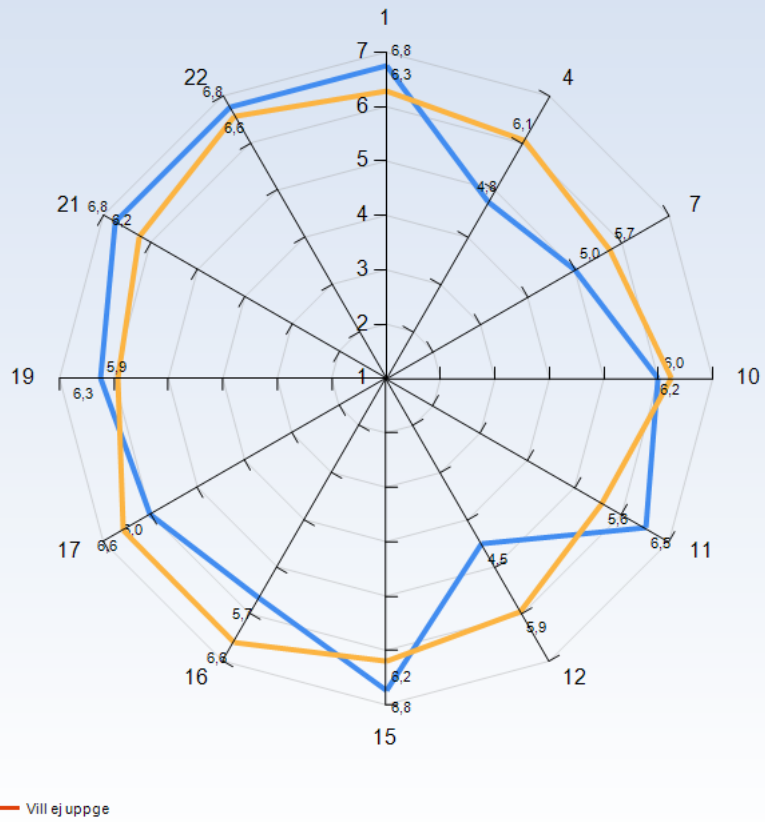
Comments (I am: Svensk student i årskurs 1-3)

Det känns underligt att denna kurs är ett alternativ till flervariabel analys då flervariabeln verkar mycket kompaktare och fokuserar på andra ämnen.

Comments (I am: Annan typ av student)

International student studying two five-year programmes (civilingenjörsprogram), currently in year five and three respectively.

Average response to LEQ statements - per disability



Comments



GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 0-2 timmar/vecka)

Att den var enkel. Men också kul att göra simulering i Unity
Kul att jobba i Unity

What was the best aspect of the course? (I worked: 3-5 timmar/vecka)

Det var intressant att se hur bra fiskarna (boids) såg ut, med bara den väldigt enkla koden.
Intressant område och bra föreläsare.
Jag upplever att föreläsningarna var fantastiska.
Att lära sig om ämnen som jag antagligen aldrig hade rört annars.

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

The labs were fun, but way too short and shallow.
Lärarens engagemang för ämnet.
It's a good course with fun labs and a great project
Flexibilitet och att man kunde få feedback i förväg. Stort urval av vilket projekt man skulle använda.
Att få jobba i unity.
Stor frihet i Projektet
Allt stöd man fick genom labbarna! Var superbra att man kunde fråga mycket vid labbarna utan att känna betygskrav det förberedde mig bra för projektet
Tycker att kursupplägget var bra. Rolig kurs. Bra med doodle för att se när eleverna är tillgängliga.
The lectures and labs taught me about how physical simulations are implemented in virtual environments

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

The way it was formatted. To first have three labs and then a project was a good way to learn.
Att det var väldigt många praktiska exempel från arbetslivet om vad kunskaperna kan tänkas appliceras på.
The project

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

Labbarna och sedan projektarbetet
De väldigt praktiska uppgifterna, det var väldigt enkelt att se vad man hade gjort, och hur det var användbart

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

The project. It was interesting and a good learning experience.



What would you suggest to improve?

What would you suggest to improve? (I worked: 0-2 timmar/vecka)

Inget

Uppdatera informationen på canvas! Väldigt mycket va utdaterat och det var ofta oklart när deadlines var och vad som krävdes för att få E i de olika momenten.

What would you suggest to improve? (I worked: 3-5 timmar/vecka)

Lab 3 var extremt oklar. Vad var målet? Ändra en siffra och ta bild på vad som händer? Okej???

Borde ha mer föreläsningar i övningsklassrum istället för VIC eftersom att det finns fler bor och stolar. Och är lite lättare att förbereda.

Kanske fler labbtillfällen.

Labbarna kändes ibland lite för lätta, lite mer eget kodskrivande hade varit kul.

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

The labs should be made more challenging. There is no need for an exam, make the labs more challenging and require a reflection on the project to be submitted in the report.

Mer föreläsningar om Finita Element Metoden och Navier-Stokes.

Lab 3 var inte så väl förklarad, och det är ganska svårt att försöka återskapa den själv.

The instructions for part 1 of lab 2 and lab 3 is a bit unclear, could be better

Mer tid på projektet eller ta bort projektet helt och istället ha mer utmanande labbar.

Lite tydligare instruktioner för labbarna och kanske lite mer konkreta uppgifter än att bara ändra på värden och se vad som händer.

Tydligare riktlinjer för vad som förväntas av projektet. Det var mycket svårt att veta vad som var nog och hur mycket som behövdes göras.

Rapporten var särskilt svårtolkad, instruktionerna var inte alls hjälpsamma och jag vet ännu inte om jag gjorde på rätt sätt.

Kommer inte på något. Kanske lite tydligare information kring kriterier och vad som krävs i projektet. Men de anställda var tillgängliga och svarade på frågor.

The lectures for the mathematics (differential equations) were a bit hard to follow

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

It would have been good if there was an "important dates" section on canvas from the start.

Labbarna skulle kunna vara mer strukturerade, lärarassistenterna skulle till exempel kunna gå igenom olika begrepp mer.

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

Tydligare information om vad varje föreläsning ska handla om, samt bättre introduktion till Lab 3

Det var lite svårt att förstå vad man behövde göra i projektet och vad som behövdes för att få betygsstegen

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

Maybe more guidance early on in the project. I think many could benefit from that, as its often hard to get started.



What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 0-2 timmar/vecka)

Börja med projektet i tid. Skjut inte på arbetet.

Ta vara på stödet man kan få i VIC studion.

What advice would you like to give to future participants? (I worked: 3-5 timmar/vecka)

Har ni svårt med en labb så har ni antagligen övertänkt den. Ingen uppgift i labbarna är mer än högst 3-4 rader enkel kod.

Ta tillfället och diskutera med lärarna och andra elever. Diskutera med Personer från VIC är trevligt!

Börja med labbarna i tid!

Börja i tid med projektet.

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

Start early with the project.

Börja smått med projektet och bygg ut det allt eftersom.

Start with the project in time

Gör klart labbarna i tid för att kunna jobba med projektet så tidigt som möjligt.

Chill kurs

Börja med allt tidigt

Jobba galit med projektet så att det alltid finns en visualisering

Börja i god tid med projektet.

Start your project in time!!

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

Start early, ask if you need help.

Börja med labbarna i god tid så att man kan fråga en assistent på labbarna om man har några frågor.

Go to the labs

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

Börja med labbarna direkt så full fokus kan läggas på projektarbetet.

Se till att jobba ordentligt med projektet, det tar mer tid än du tror

What advice would you like to give to future participants? (I worked: 21-23 timmar/vecka)

Do a project that you think will be fun and challenging and focus on implementing the core features first.

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 0-2 timmar/vecka)

Nej

Nope

Is there anything else you would like to add? (I worked: 3-5 timmar/vecka)

Hade varit kul att se demo av de färdiga projekten från andra klassmedlemmar, inte bara idéerna.

Is there anything else you would like to add? (I worked: 6-8 timmar/vecka)

Det var ganska otydligt vad som krävdes för att man skulle få godkänt på projektet.

Nej

Nej.

SPECIFIC QUESTIONS



RESPONSE DATA

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

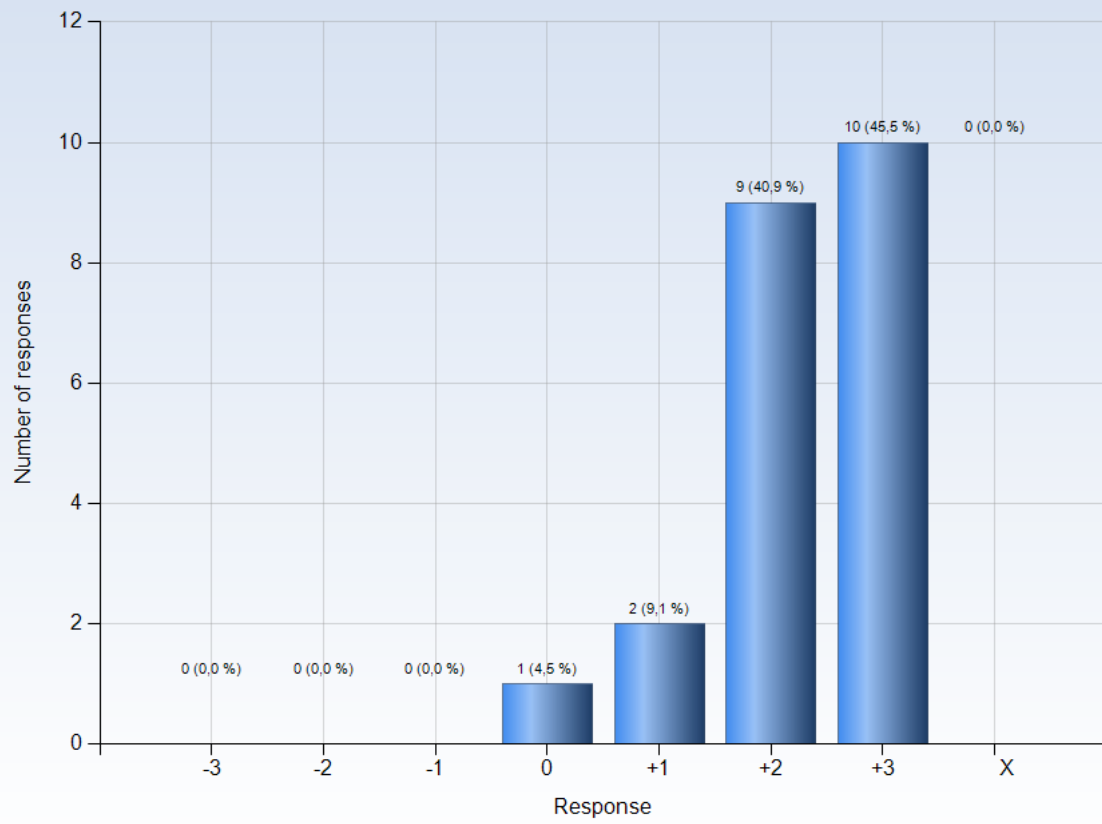
-3 = No, I strongly disagree with the statement

0 = I am neutral to the statement

+3 = Yes, I strongly agree with the statement

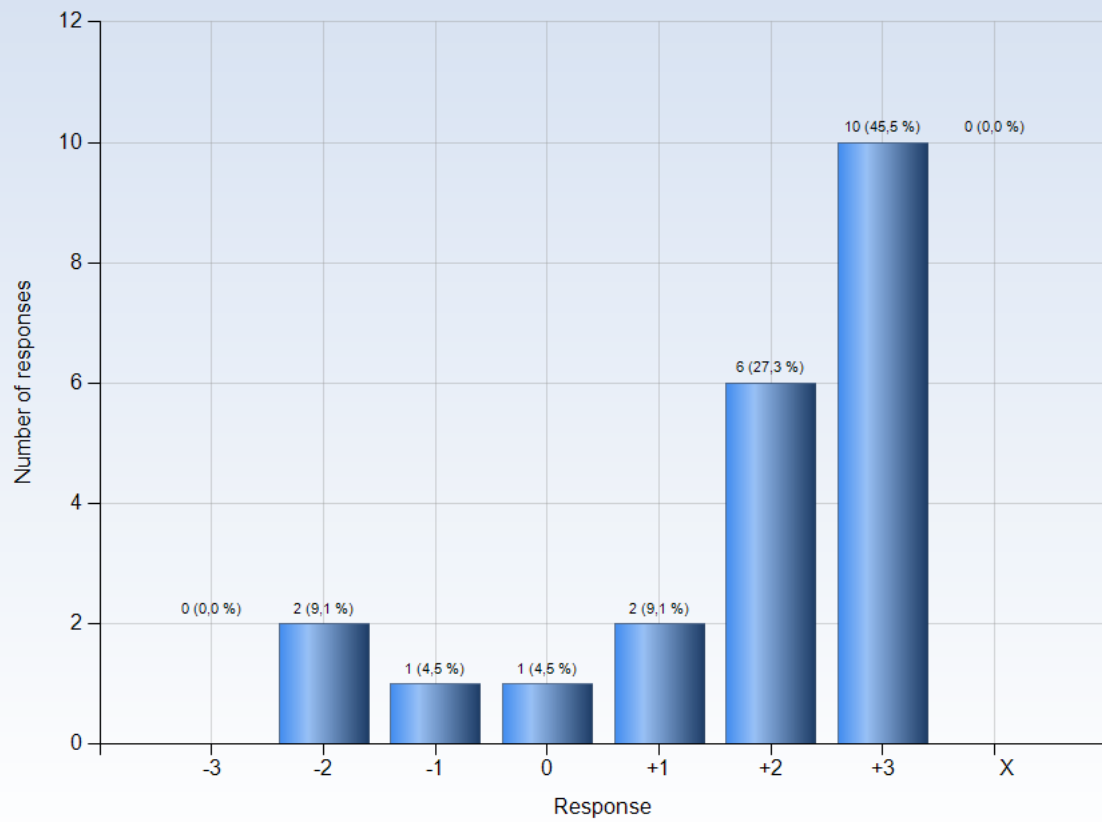
X = I decline to take a position on the statement

1. I worked with interesting issues



Comments

4. The course was challenging in a stimulating way



Comments

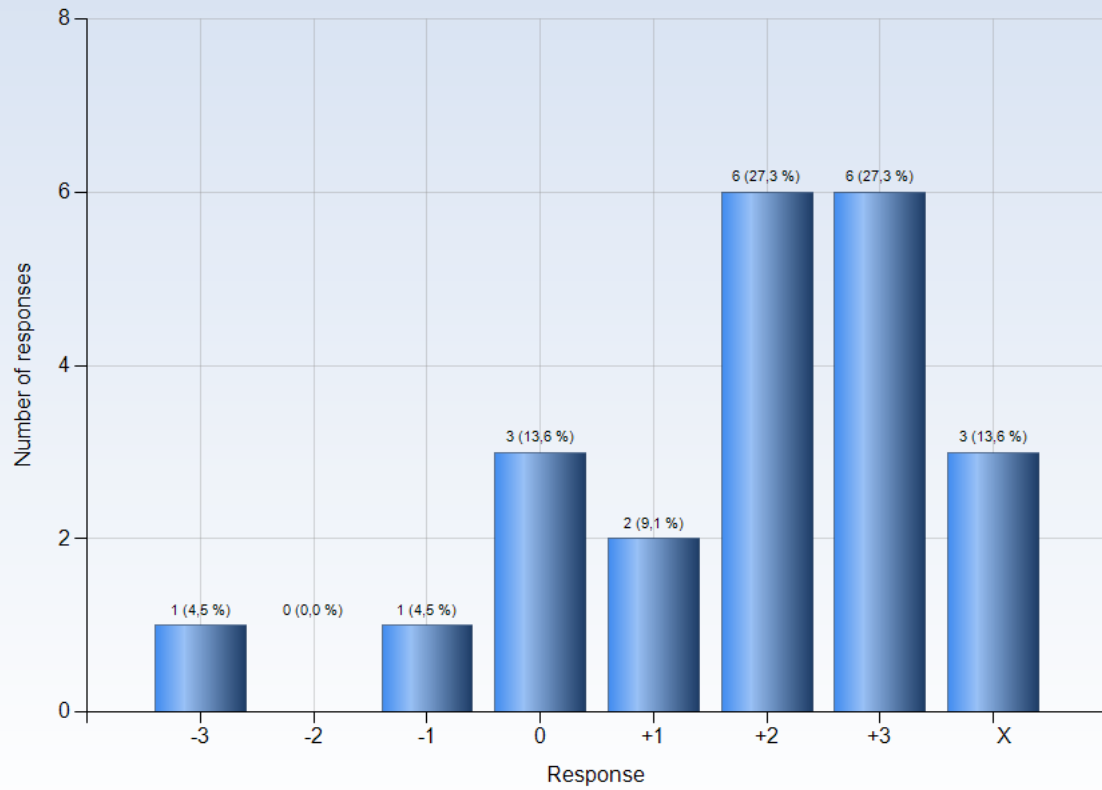
Comments (My response was: -2)

The course should really be more challenging, especially the labs.

Comments (My response was: 0)

Var intressant men saknade struktur och faktiskt arbete. Det var väldigt mycket teori.

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



Comments

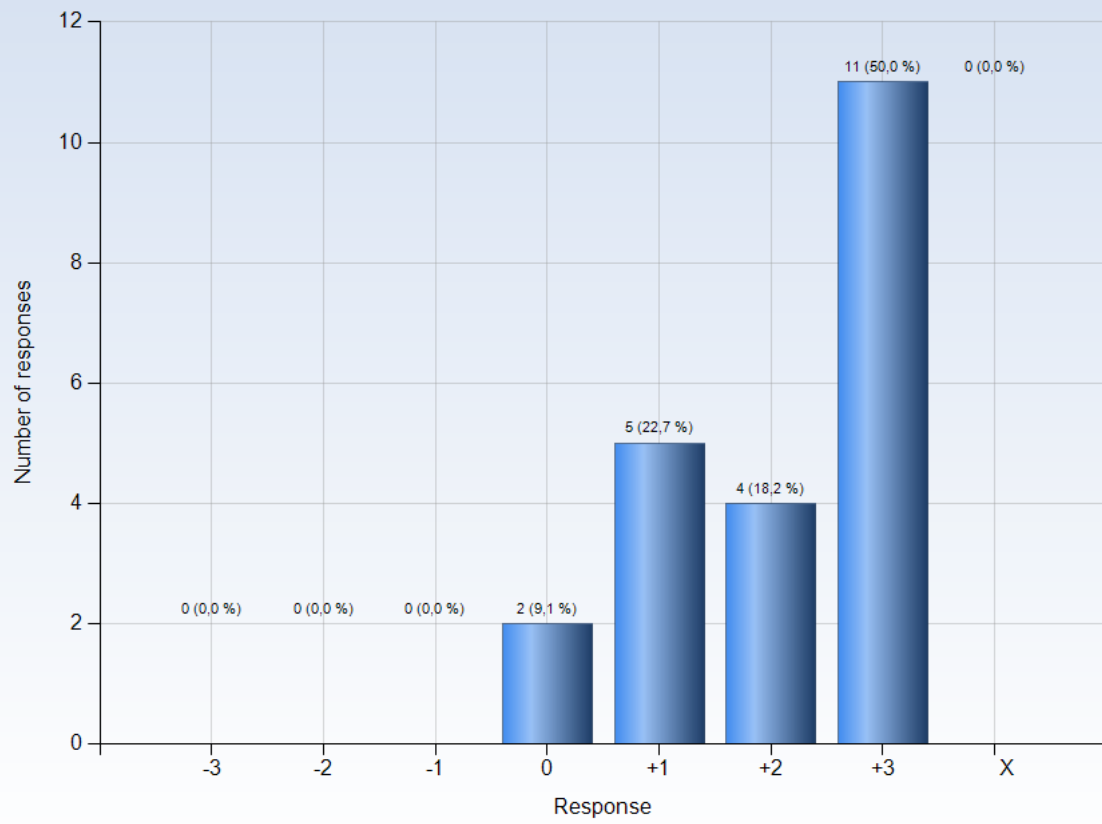
Comments (My response was: +1)

I don't think we truly fulfilled the learning objectives based on what we did in the course, but they were related.

Comments (My response was: X)

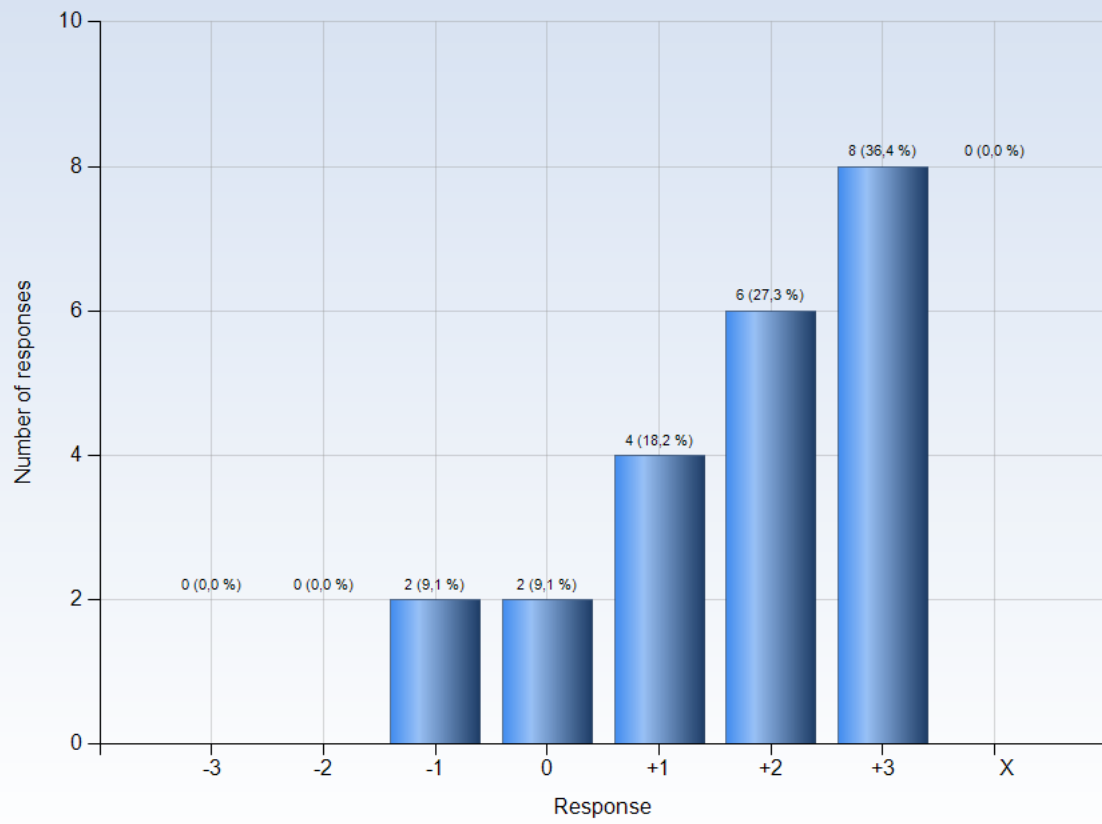
Jag använde inte lärande målen tillräckligt mycket. De hade varit bra om man gått igenom dem i början av kursen.

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



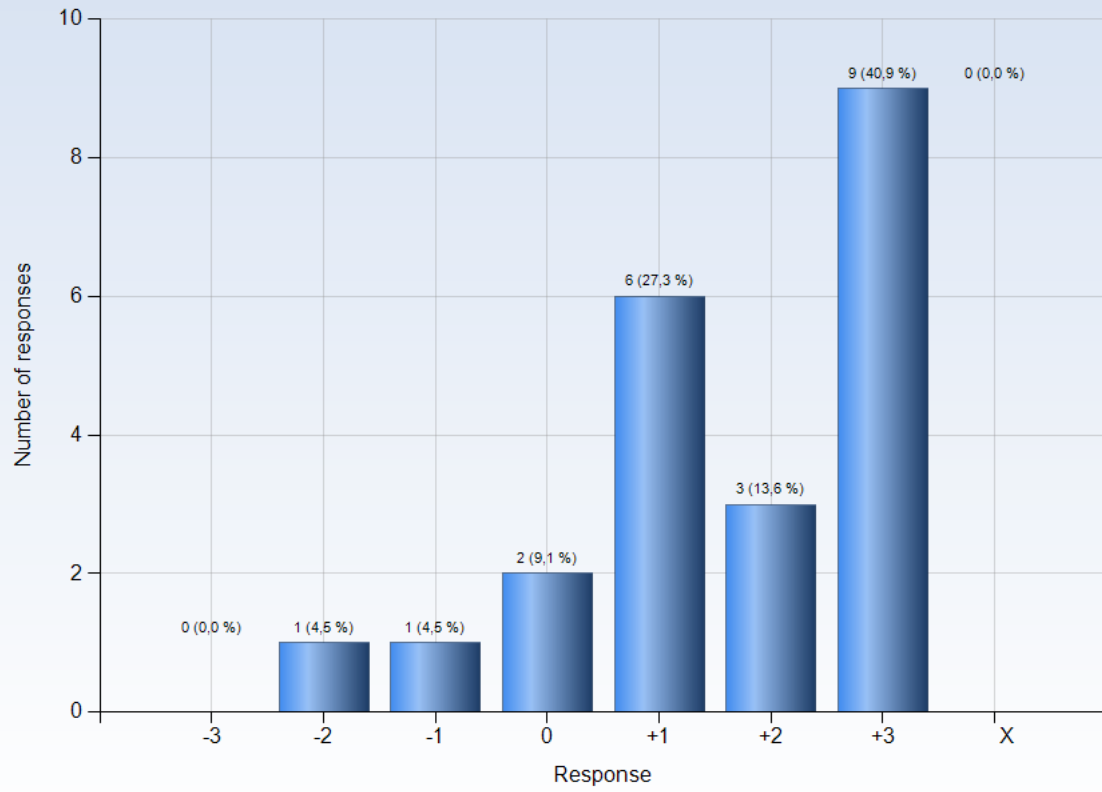
Comments

11. Understanding of key concepts had high priority



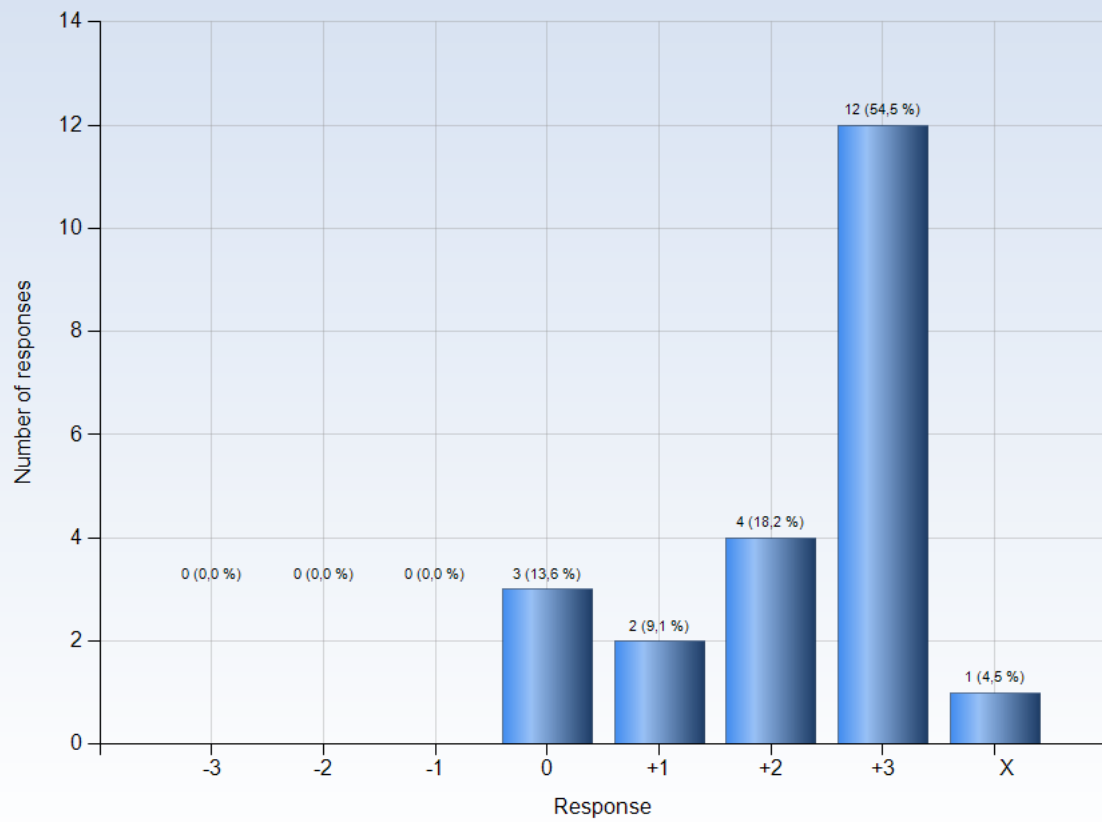
Comments

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

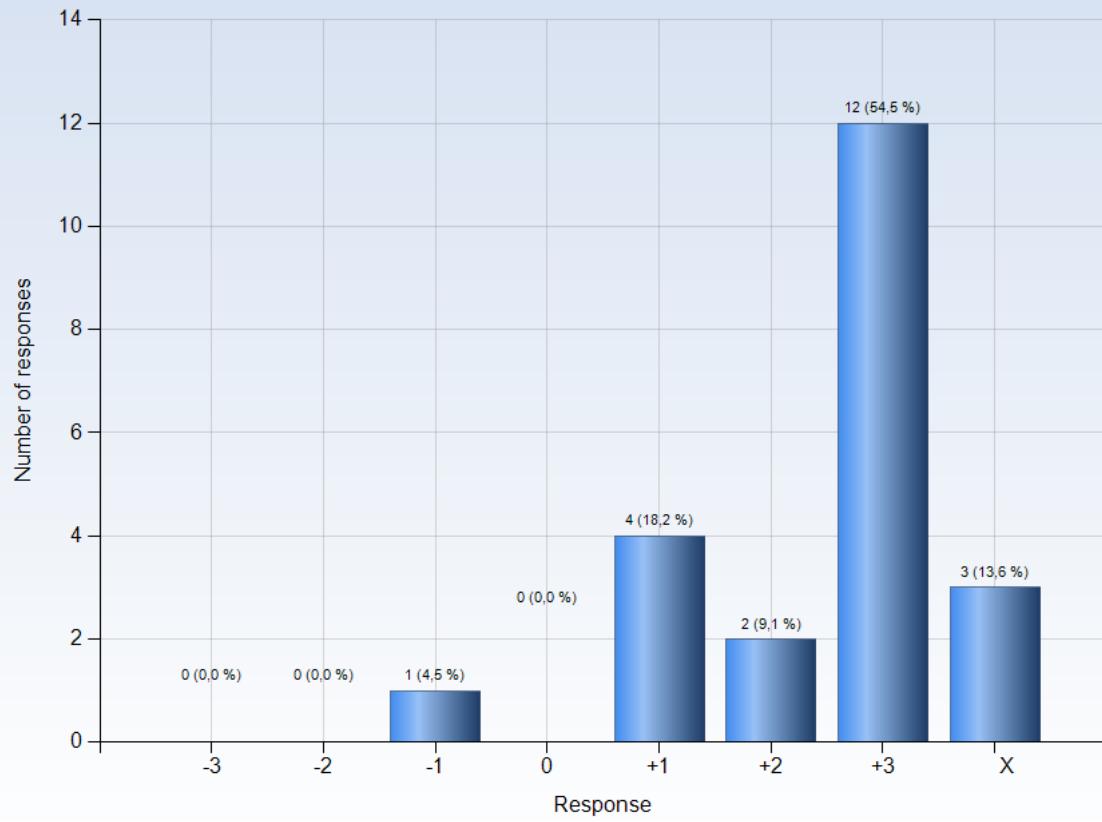


Comments

Comments (My response was: +3)

Kursen var bättre än de nästan alla andra kurser. Jag tror det beror på att det är en mindre klass.

16. The assessment on the course was fair and honest



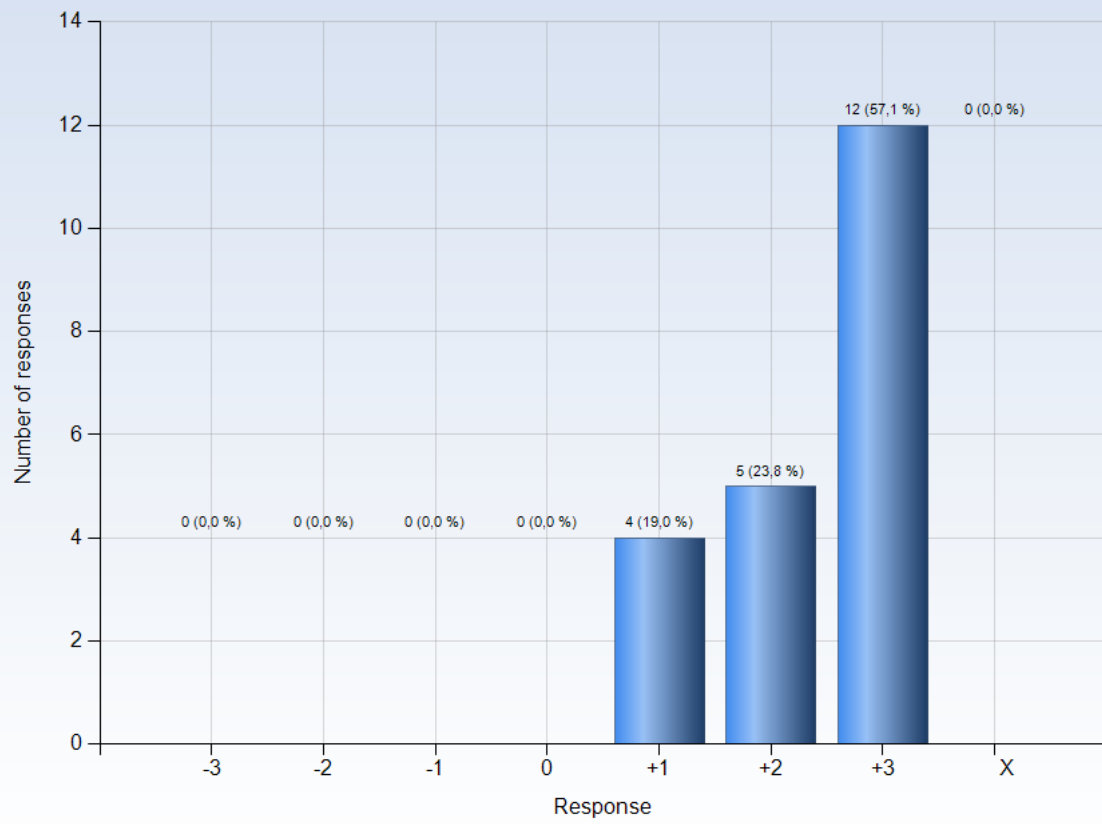
Comments

Comments (My response was: X)

Varken projekt eller tenta rättad. Svårt att säga.

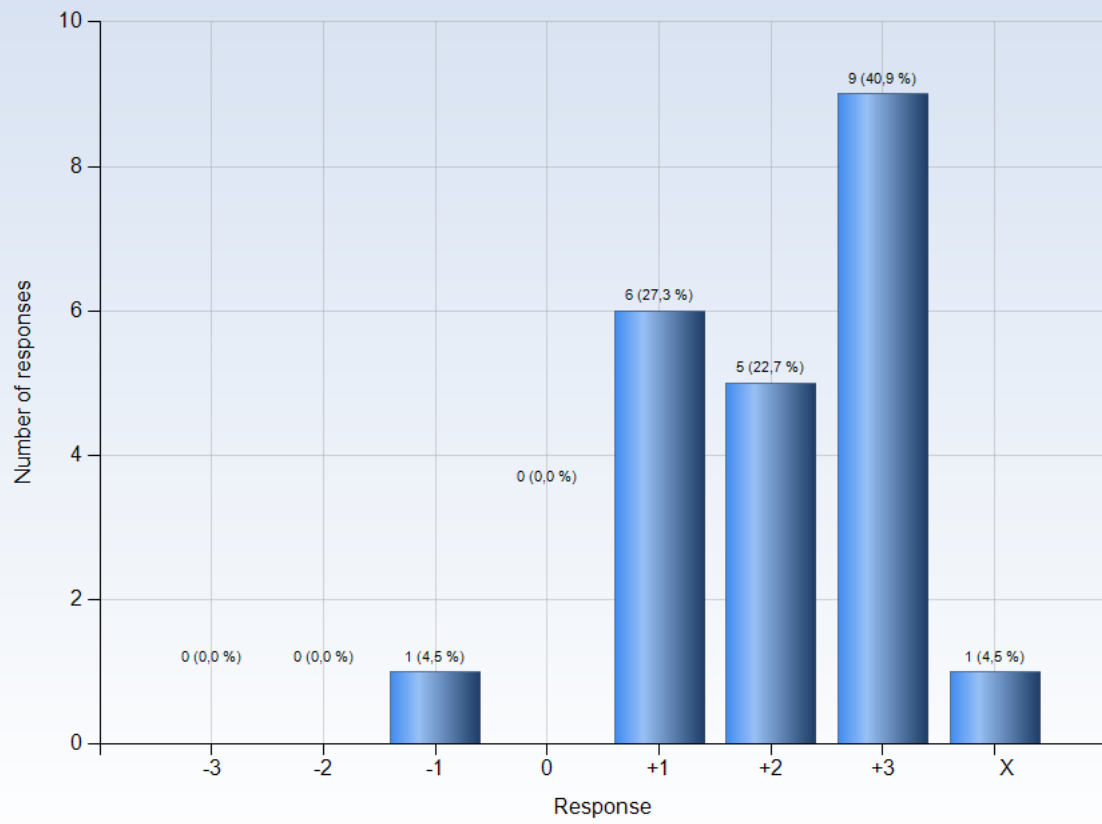
Jag har inte fått resultatet från tentan men annars var det rimligt.

17. My background knowledge was sufficient to follow the course



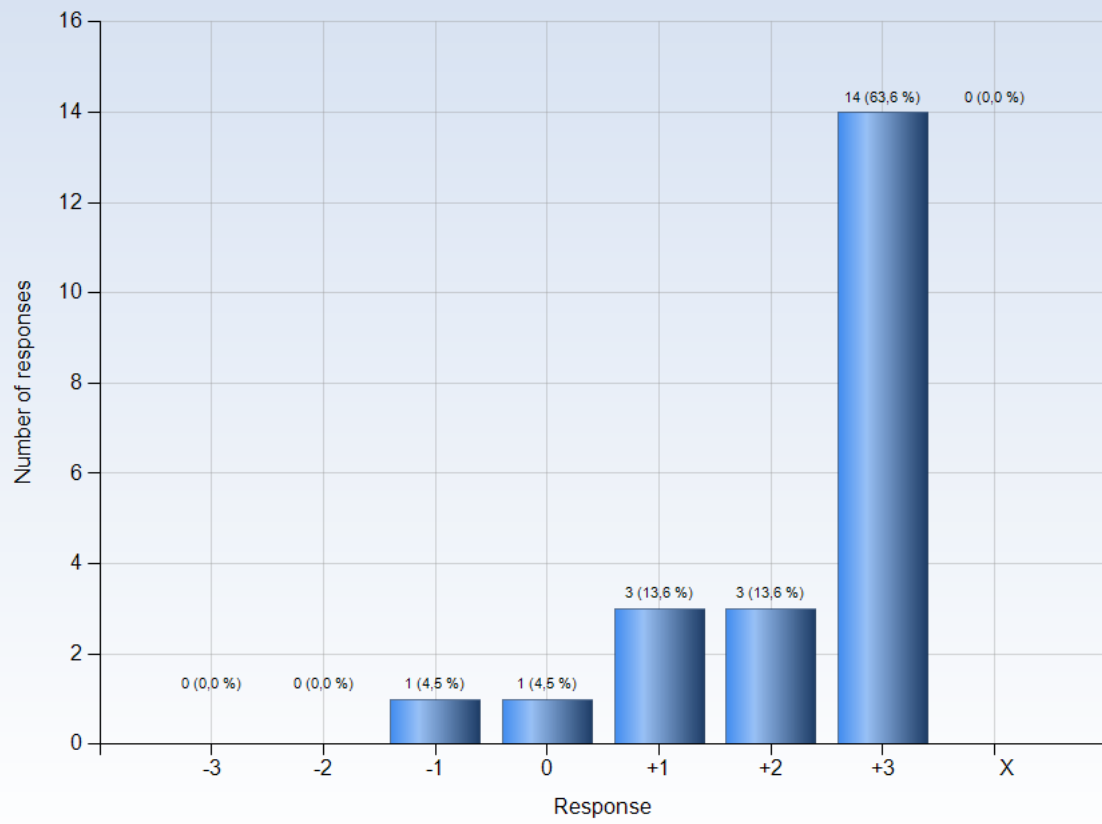
Comments

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



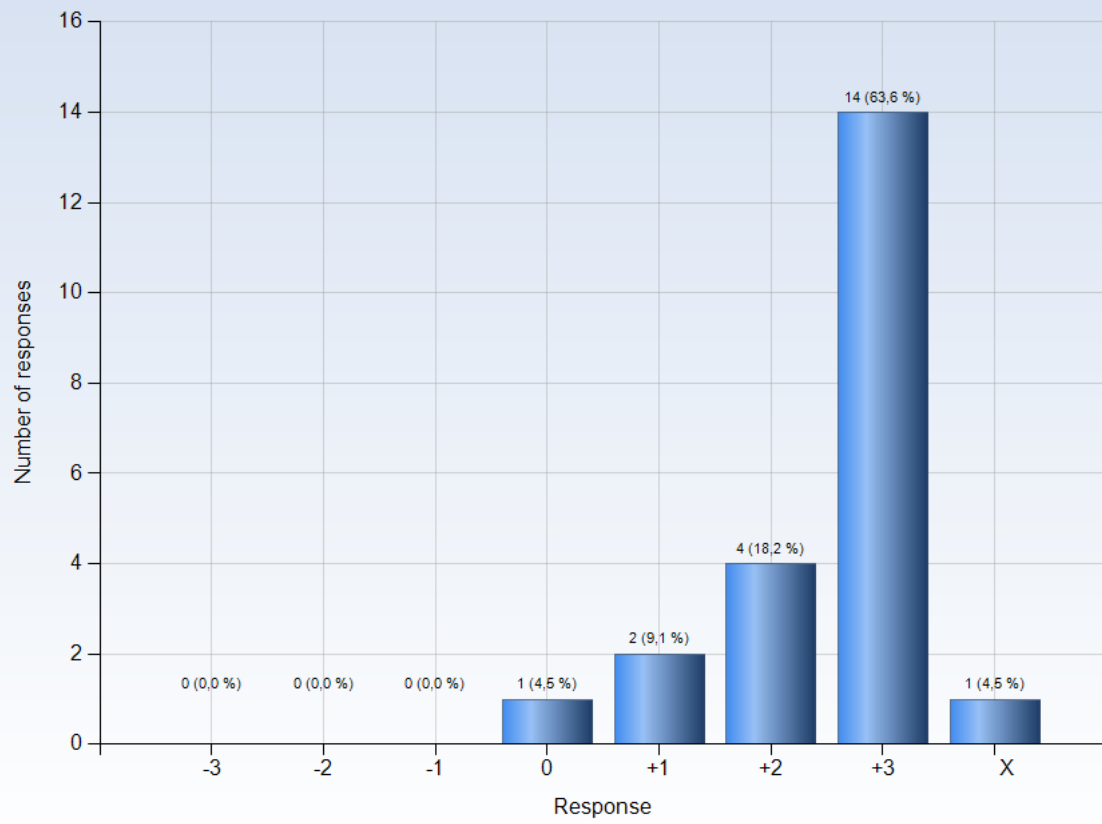
Comments

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



Comments

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



Comments