



Report - MG2022 - 2021-05-06

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):

Lasse Wingård, lw@kth.se; Per Johansson, pj@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.

A course evaluation questionnaire (LEQ 22) was open for answers for all students 2021-03-31 - 2021-04-30. 9 out of 35 registered students did answer the questionnaire, but only 28 of the 35 registered students have really actively taken part in the course. In addition to the questionnaire, students are required to write a final report describing their key learning experiences for each of the CAD models they have created during the course, and in this report, most of the students have also included a personal reflection on the course and its value for them. The final examination/presentation, which is done individually at a computer, where all the models of the students are studied and discussed, is also an opportunity for the students to give and for us to receive oral feedback. No special investigation regarding gender or disabilities were carried out, except for what is included in the LEQ questionnaire.

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.)

No meetings except classes (2x3h/week in P2, 1x3h/week in P3) and final examination. Attendance is not required, but many students express appreciation for the opportunity to get individual help at classes.



COURSE DESIGN

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

During P2, exercises are distributed to the students at the start of classes in form of engineering drawings from which they shall create a CAD model. Initially students are given time during most of the class to complete the exercise, the best they can. During the last part of the class, we then present how we create that model and explain why it is done that way, trying to teach students a modelling strategy to ensure that the resulting model is of good quality. These drawings, and thereby the exercises, are gradually getting more and more complex, and require more time to complete, where students for the last drawing distributed are given up to 10 hours to complete the model, before we present our solution. All exercises, and recordings of our presentations of solutions to the exercises are published on Canvas, so students who can't attend at classes, can still take part of the same information, although videos are published with a delay of at least one week, to give those who are absent time to try on their own, before seeing our solution.

During P3, students work with drawings and models of their own choice, picked from a library of drawings that we provide. Typically, the complexity of these drawings are equal to or higher than the final exercises during P2. Classes are dedicated to individual supervision and assistance in solving the chosen modelling tasks. Students can choose which final grade they are aiming at by the number of models that they choose to create, and the complexity of each model. For the highest grades students are also required to do an additional evaluation of a fellow student's model, and to include an overall personal reflection on their learning experience throughout the course.

As, mentioned above, students have to write and submit a report documenting all their models by describing the key modelling methods used and intermediate and final model, in text and images. When this report has been submitted, the student book a time for the final presentation, and at the end of this final presentation session, the student is given the final grade.

No changes have been made to the course design, from previous course offering, but the recording of our solutions to the P2 exercises were something new, and that was primarily to adapt to the Covid situation, but we found it useful, so we will keep it for future courses.

THE STUDENTS' WORKLOAD

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

It varies between students, depending on the grade they are aiming at, and thus the number of models they choose to create, but scheduled classes sum up to 72 hours and in addition to this, students have to do additional work between classes. The number of hours per week spent on the course among students that answered the course evaluation questionnaire vary from 3-5 hours up to 24-26 hours, but with the average and the majority spending about a total of 12 hours per week on the course. If we only count the weeks with classes, this sums up to 192 hours in average, which is slightly more than the 160 hours corresponding to 6 credits. However, one reason for this is that the students who have answered the questionnaire are likely mostly those who have aimed for a higher grade, and thus have had to put more effort and time into the course. This year, we have also had many students who have not attended classes during P3, due to the pandemic, and thus have had to solve problems on their own, rather than getting tips and help from us, and that has probably taken more time.

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?

As mentioned above, 28 students have been active in the course, 23 of them have completed the course, and two more are about to complete it, having scheduled their final presentation. We expect the remaining three students to complete the course before the end of this academic year, which would mean that all active students this year will pass the course. The final grades cover the whole range, from A to E, with a quite even distribution, except for grade C, which was awarded to a single student. The seven students who are registered, but not been active



STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

What was the best aspect of the course?

- The support (if needed) for any exercises or problems that occurred.
- Att man kunde få mycket hjälp hela tiden och att man vågade be om mycket hjälp.
- The free time management. Good examples with explanations if you got stuck.
- Yellow and red models
- Just taking my time and doing some cad
- I really liked the fact that, during the first period, we had time to struggle and learn by ourself before getting the answer
- Helt klart att lära sig nya funktioner och få det avancerade tänkte för CAD.
- Våren. Surfacing-metoder var kul att få lära sig.

What would you suggest to improve?

- Maybe if we had got a brief tutorial on the functions we were going to apply in the models before we worked on drawings. That would have aided in some cases where it was almost impossible to guess.
- Introducing some more models in red and yellow so that others can have variety to choose from if aiming for higher grades
- Nothing
- Maybe having the course twice a week during the second period could help
- Svårt att säga när det är pandemi och lärarna skötte det väldigt bra med väldigt bra lösningar. Kursen består i största del av eget arbete och lärarna ger oss tillräckligt med hjälp och verktyg för att vi ska klara av det.
- Tydligare hur slutrapporten borde se ut. Ge ett exempel.

What advice would you like to give to future participants?

- Have fun
- Att gå på alla lektioner och hänga med i kursen.
- Use the knowledge the teachers have and don't be afraid to ask questions. Spend the time wisely and don't wait until the last minute to do the

assignments. They require a lot of time.

- Take the second period of the course seriously
- Spend time to understand how the drawings are
- To start making the report as soon as the first part is done and take some notes on what was complicated or challenging for each part and activity
- Gå på alla labba första perioden, då du inte vill halka efter. Det tar tid att göra en modell, fast man är kunnig.
- Andra perioden, förbered modeller innan labbarna, så kan ni fråga om problemen som har dykt upp.
- Installera SolidEdge på hemdatoren om den klarar av det.
- Tänk inte på måtten alls.

Is there anything else you would like to add?

- I really liked this course. It's one of the course I could where I really see my improvements
 - Väldigt bra kurs, en av mina favoriter.
 - Det är inte okej att man går ut med namn på studenter, både för i år och tidigare års CAD-modeller. Det är inte bra att göra så enligt GDPR. Ni borde göra peer review-modellerna anonyma. Det känns inte bra att modellerna måste ha namn på.
-

SUMMARY OF STUDENTS' OPINIONS

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

Overall, the students agree to a very high degree to the statements in the LEQ questionnaire. Statement #5: "I felt togetherness with others in the course" had the lowest score (4.8), but that can be attributed to the pandemic. Statement #21: "I was able to learn by collaborating and discussing with others" also received a lower score (5.3), probably due to the same reason. However, even these "low" scores were more in favour of than opposing the statements. Statement #20: "I had opportunities to influence the course activities" also received a lower score (5.0), but that is in line with our expectations/plans.

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.

As usual, this is one of our favourite courses to teach, and the results were similar to those in previous course offerings. This year we had some students who tried and manage to create a reasonable model from a very complex drawing, that had not been tried by anybody before. That triggered us to also complete that model, something we had not succeeded to do previously.



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?

Female students are slightly more positive to the statements than the males.

Not enough answers to see the view of international students, but the Swedish master students are overall slightly less positive than the whole student body, so you can probably conclude that the international master students agree to a larger extent.

PRIORITIZED COURSE DEVELOPMENT

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

No need to make any changes to the course based on the feedback from students or our own views. However, as we will start a new course in additive manufacturing (AM), there is no need to keep the exercise and the assignment in AM that are included in the current course. That will however require that this course is replaced by a new Advanced CAD course, as the current course title includes a reference to AM. That new course can not be started until the fall semester of 2023, so that is our plan.

OTHER INFORMATION

Is there anything else you would like to add?

No!

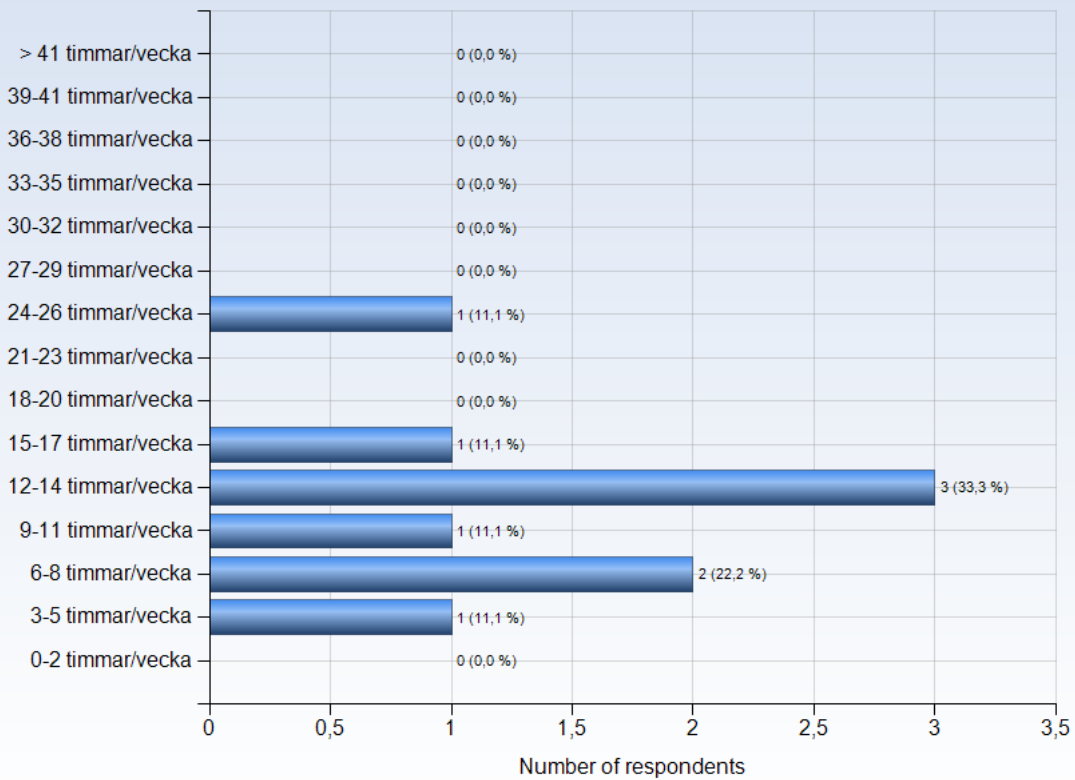


MG2022 - 2021-03-12

Antal respondenter: 35
Antal svar: 9
Svarsfrekvens: 25,71 %

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)

Good amount. A bit annoying that the course laps over period 2 & 3. Would have preferred one period.

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

The second period of the course is quite demanding and requires time to complete the voluntary models.

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

It really depend on who you are. But I would say that the drawing takes time to understand but it was a challenging course

Fyra timmar per vecka för varje lektions tillfälle, sedan var det till och från hur många timmar man gjorde hemma. Jag försökte påbörja period 3 modellerna innan jag kommer till lektionstillfälle, för då kan jag fråga om problemen jag stött på.



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:

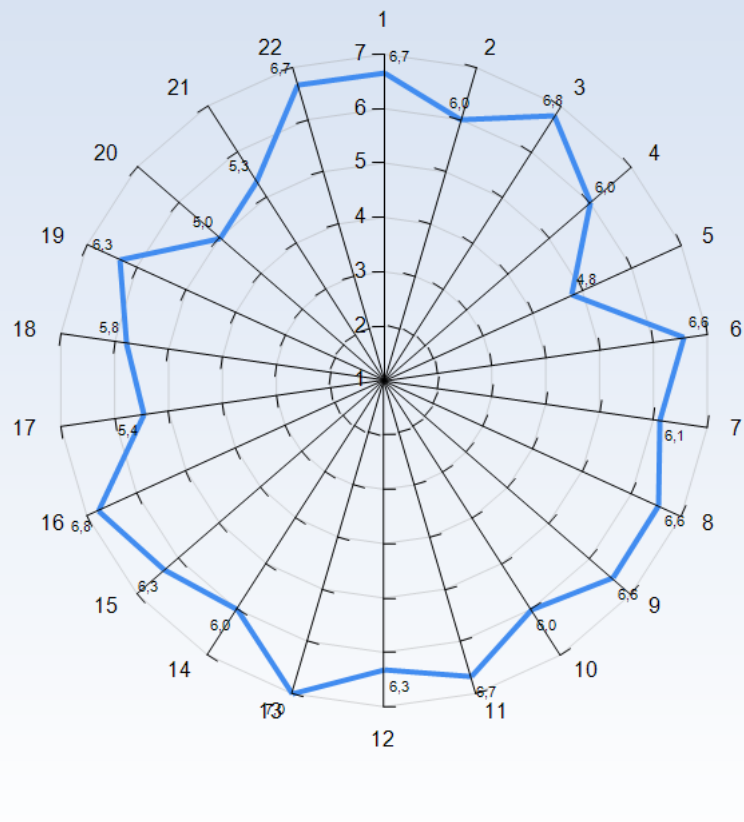
1 = No, I strongly disagree with the statement

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.

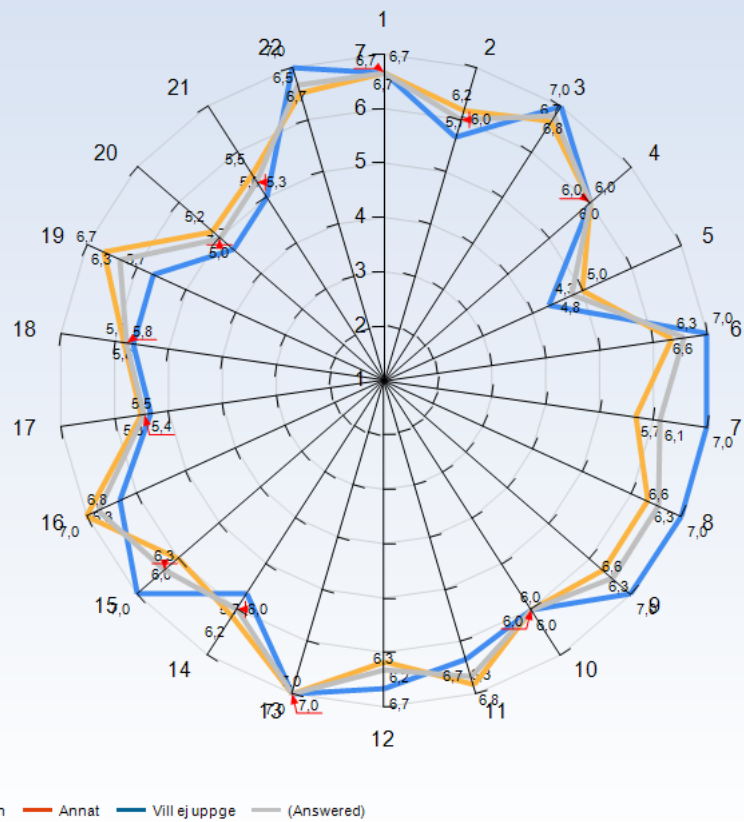
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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

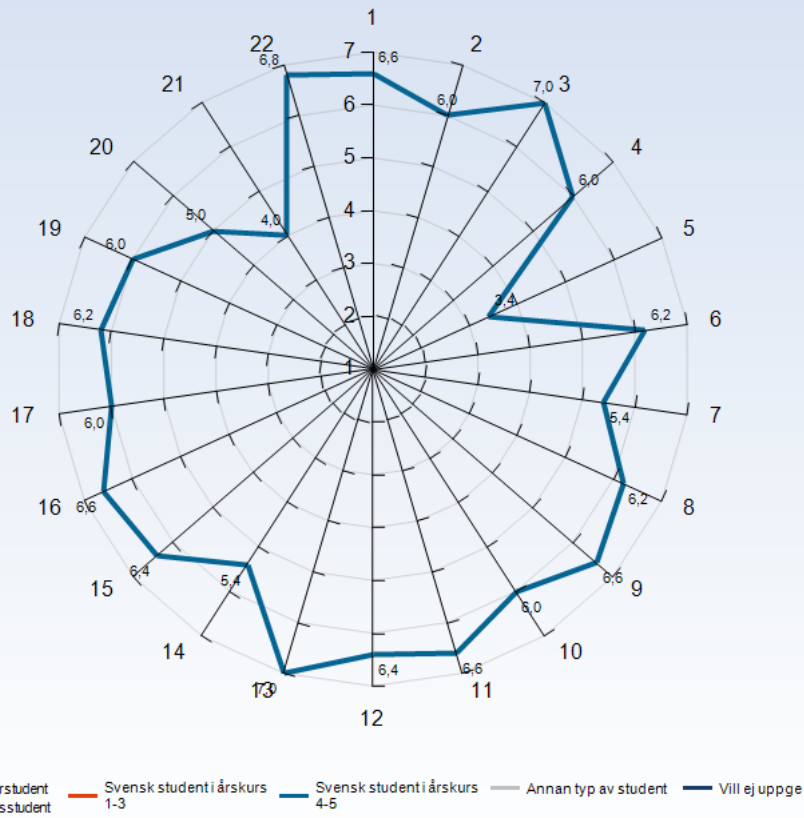


Comments

Comments (I am: Man)

Har inga speciella kommentarer, angående detta. Alla i kursen studerade från mitt perspektiv inom samma termer.

Average response to LEQ statements - per type of student



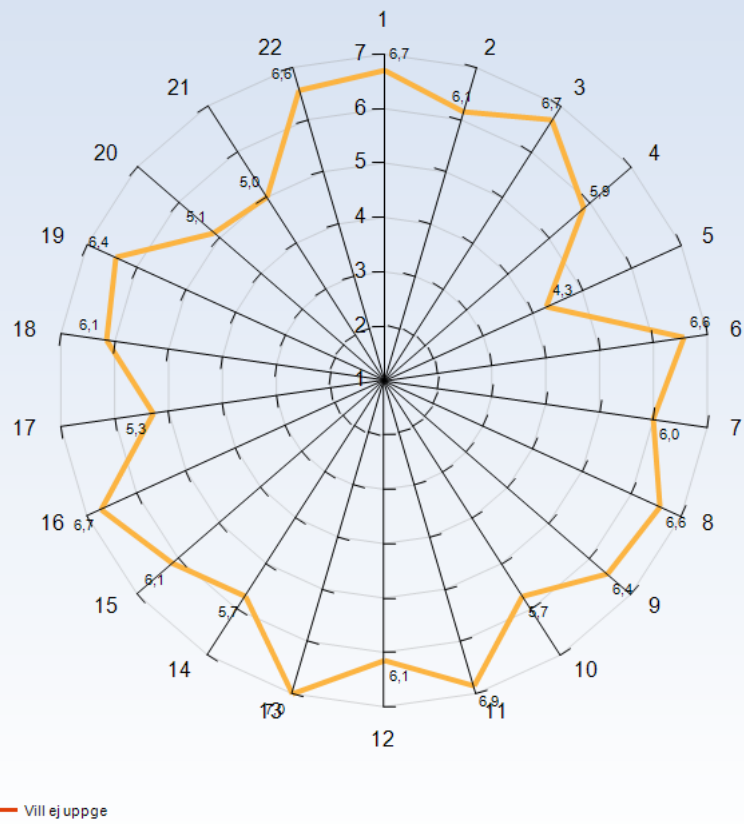
Comments

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

Somewhat elementary course after a couple of years of learning at KTH, however, it had a lot of important aspects that concerned software and thought processes about different manufacturing issues (talking about AM, CNC etc)

Förstår inte vad meningen med den här frågan är.

Average response to LEQ statements - per disability



Comments

Comments (My response was: Ja)

Jag är faktiskt osäker på den här frågan, då jag och mina nära misstänker att jag har ADD. Jag har bara inte tagit tag i det och kollat upp det.



GENERAL QUESTIONS

What was the best aspect of the course?

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

The support (if needed) for any exercises or problems that occurred.

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

Att man kunde få mycket hjälp hela tiden och att man vågade be om mycket hjälp.

The free time management. Good examples with explanations if you got stuck.

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

Yellow and red models

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

Just taking my time and doing some cad

I really liked the fact that, during the first period, we had time to struggle and learn by ourself before getting the answer

Helt klart att lära sig nya funktioner och få det avancerade tänkte för CAD.

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

Vären. Surfacing-metoder var kul att få lära sig.

What would you suggest to improve?

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

Maybe if we had got a brief tutorial on the functions we were going to apply in the models before we worked on drawings. That would have aided in some cases where it was almost impossible to guess.

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

Introducing some more models in red and yellow so that others can have variety to choose from if aiming for higher grades

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

Nothing

Maybe having the course twice a week during the second period could help

Svårt att säga när det är pandemi och lärarna skötte det väldigt bra med väldigt bra lösningar. Kursen består i största del av eget arbete och lärarna ger oss tillräckligt med hjälp och verktyg för att vi ska klara av det.

What would you suggest to improve? (I worked: 24-26 timmar/vecka)

Tydligare hur slutrapporten borde se ut. Ge ett exempel.

What advice would you like to give to future participants?

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

Have fun

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

Att gå på alla lektioner och hänga med i kursen.

Use the knowledge the teachers have and don't be afraid to ask questions. Spend the time wisely and don't wait until the last minute to do the assignments. They require a lot of time.

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

Take the second period of the course seriously

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

Spend time to understand how the drawings are

To start making the report as soon as the first part is done and take some notes on what was complicated or challenging for each part and activity

Gå på alla labba första perioden, då du inte vill halka efter. Det tar tid att göra en modell, fast man är kunnig.

Andra perioden, förbered modeller innan labbarna, så kan ni fråga om problemen som har dykt upp.

Installera SolidEdge på hemdatorn om den klarar av det.

What advice would you like to give to future participants? (I worked: 24-26 timmar/vecka)

Tänk inte på mätten alls.



Is there anything else you would like to add?

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

I really liked this course. It's one of the course I could where I really see my improvements

Väldigt bra kurs, en av mina favoriter.

Is there anything else you would like to add? (I worked: 24-26 timmar/vecka)

Det är inte okej att man går ut med namn på studenter, både för i år och tidigare års CAD-modeller. Det är inte bra att göra så enligt GDPR. Ni borde göra peer review-modellerna anonyma. Det känns inte bra att modellerna måste ha namn på.

SPECIFIC QUESTIONS

RESPONSE DATA

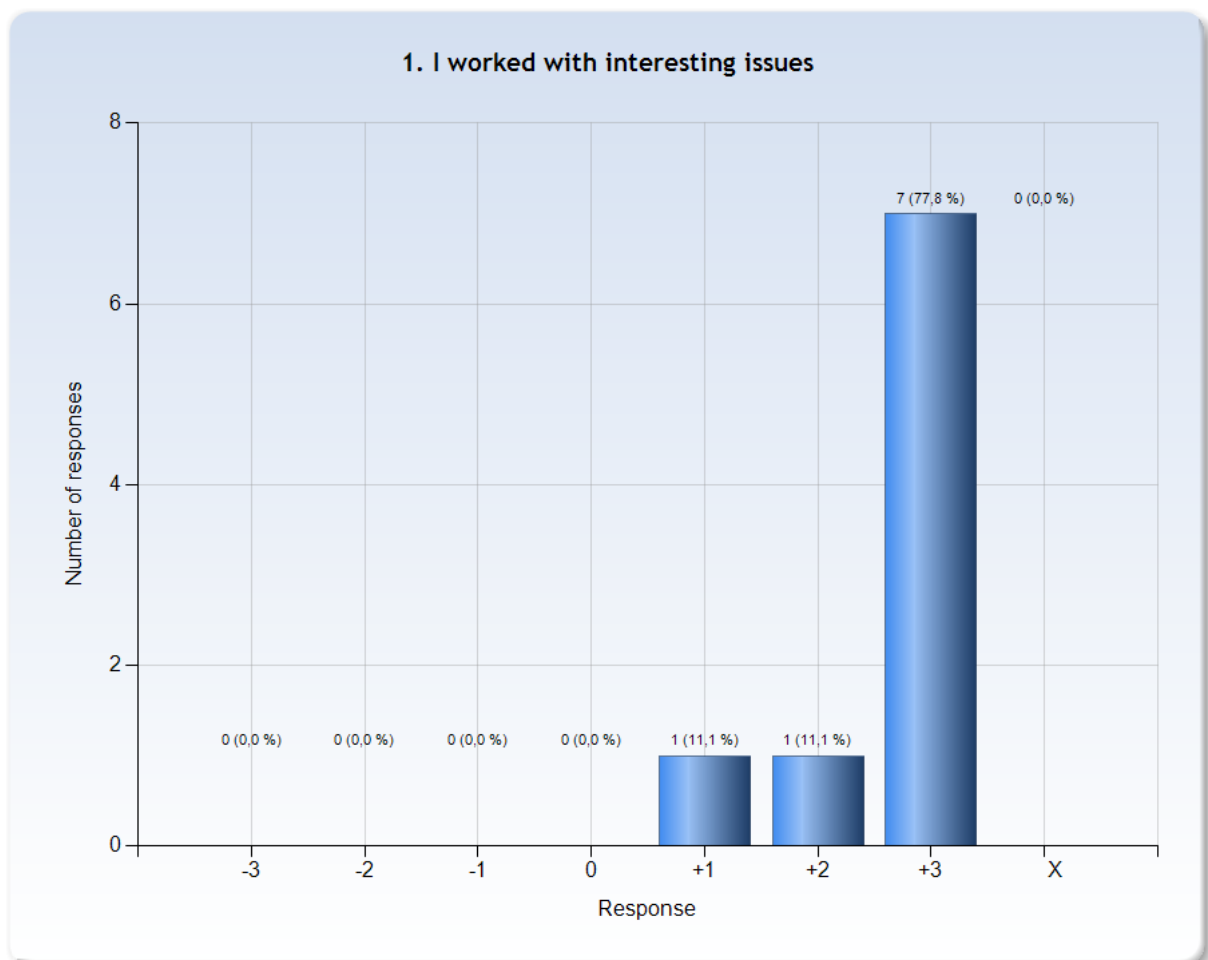
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-3 = No, I strongly disagree with the statement

0 = I am neutral to the statement

+3 = Yes, I strongly agree with the statement

X = I decline to take a position on the statement

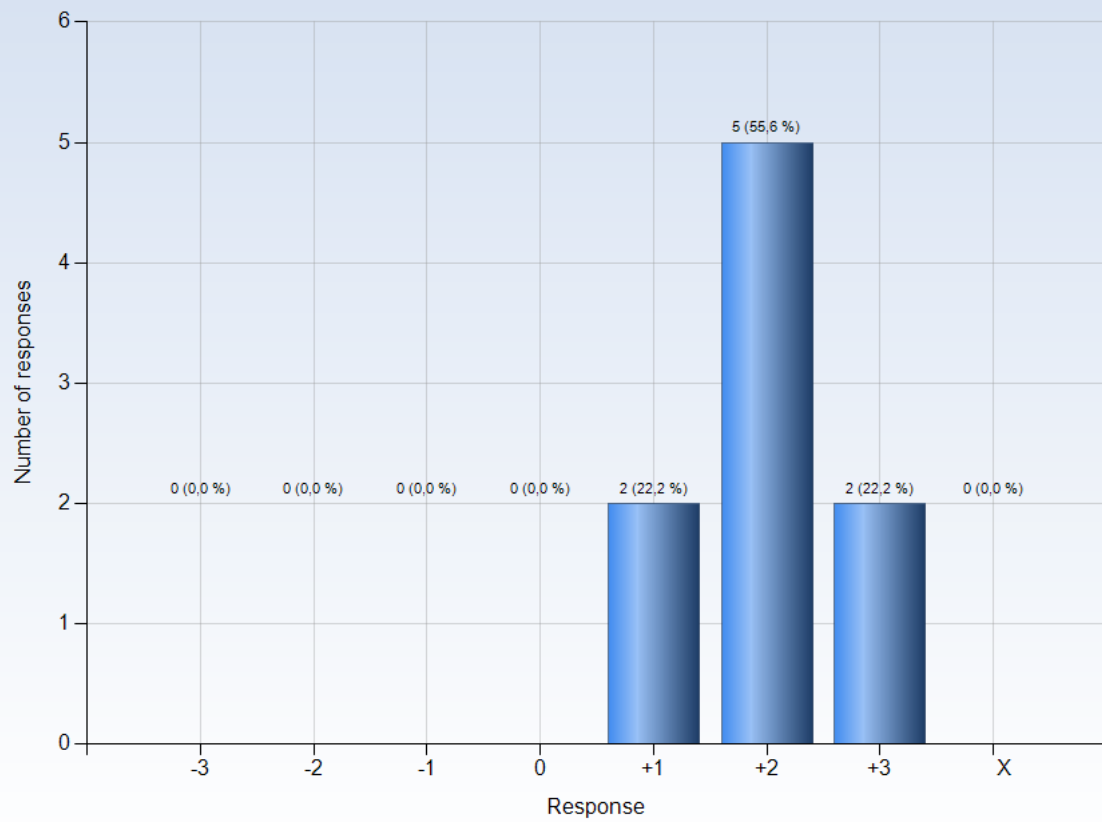


Comments

Comments (My response was: +3)

Det är det här jag tycker är kul, så för mig var det väldigt intressant.

2. I explored parts of the subject on my own

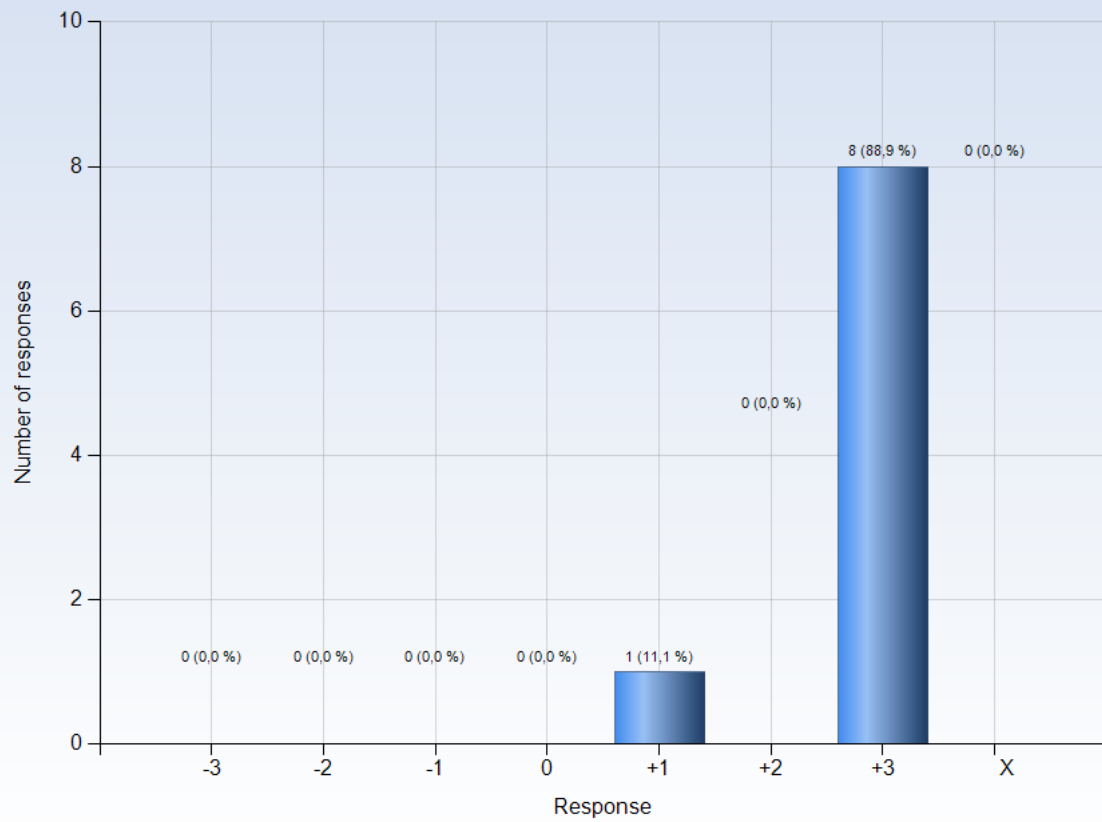


Comments

Comments (My response was: +2)

Jag använde mycket SolidEdge egna hjälpmedel, som förklarar funktionerna. Det hjälpte mig att utföra vissa operationer.

3. I was able to learn by trying out my own ideas

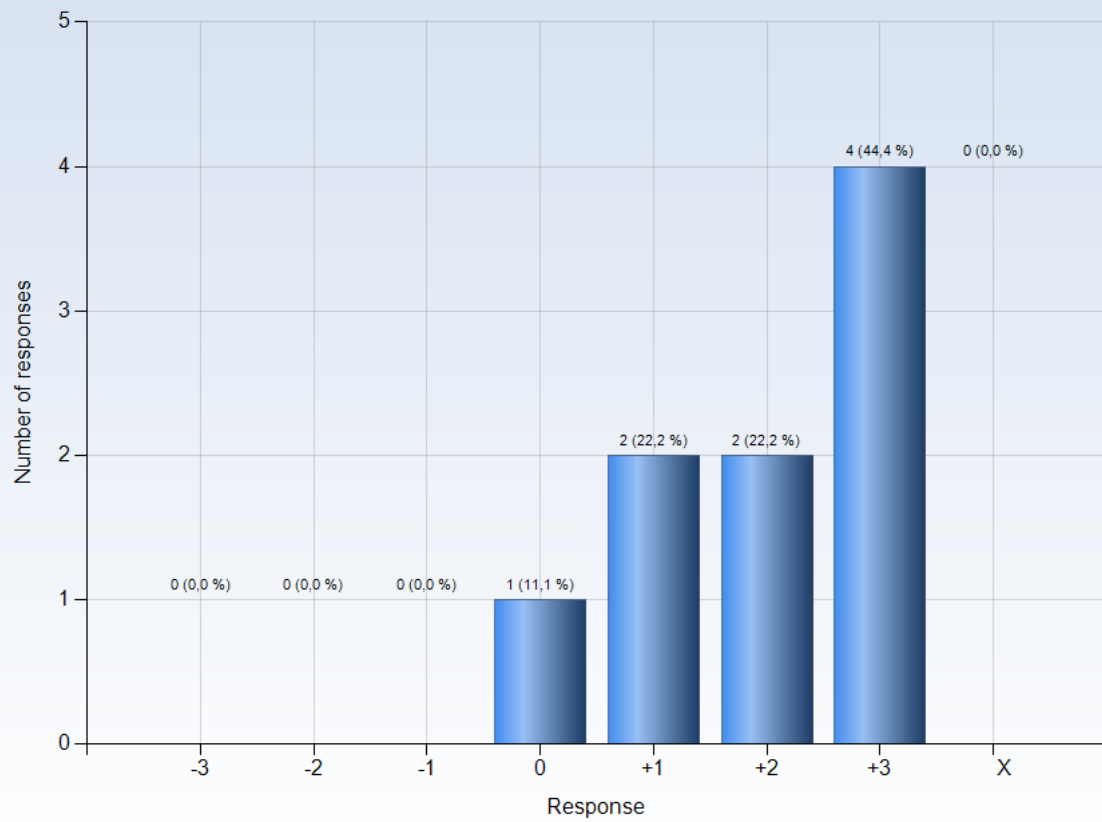


Comments

Comments (My response was: +3)

När jag hade något svårt med hemma så lekte jag runt med egna ideer och ser hur funktionerna funkar och när de är applicerbara.

4. The course was challenging in a stimulating way



Comments

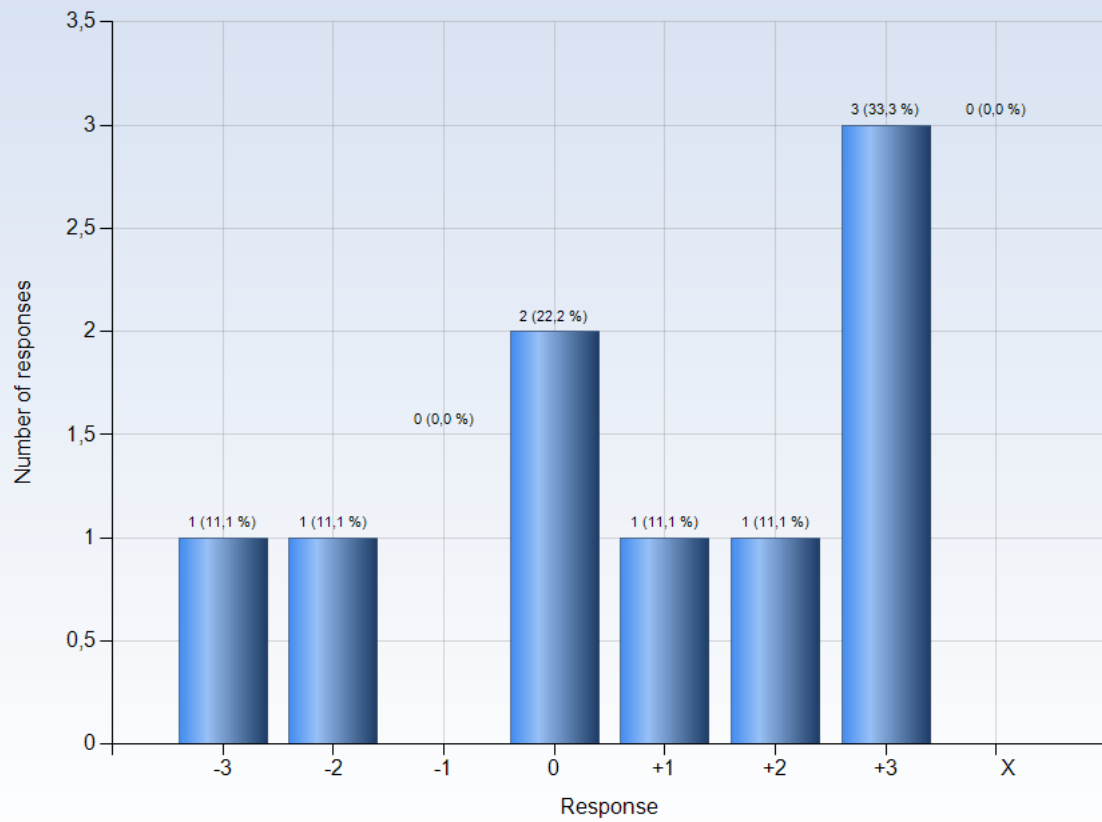
Comments (My response was: +1)

Va tydligare med att man inte ska följa mätten till 100%. Jag hade fått ut mer av det om ni sagt att man ska se till formerna blir rätt och att mätten inte behövs. Var jättetydliga för jag la ner alldeles för mycket tid på mätten och det var inte kul alls.

Comments (My response was: +3)

Jag kunde sitta i timmar hemma med problem, men det var aldrig riktigt frustrerande.

5. I felt togetherness with others on the course



Comments

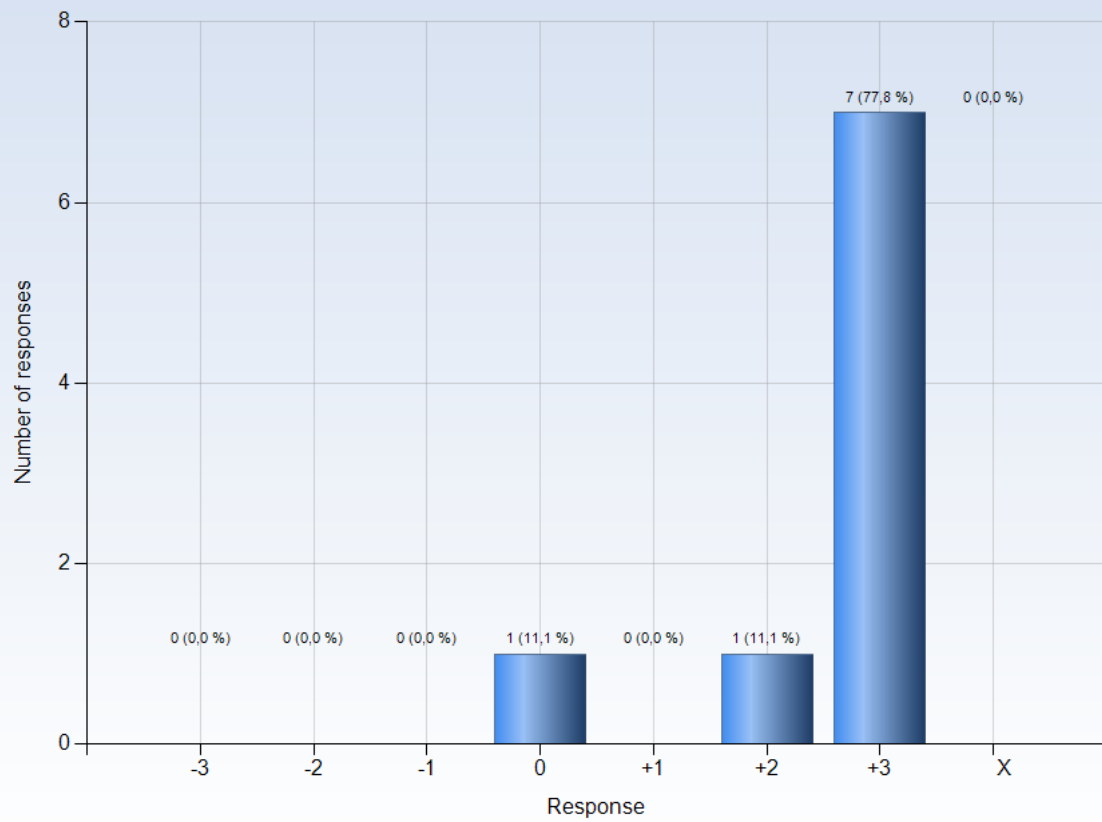
Comments (My response was: 0)

I could have spent time with the others but due to Covid19 I didn't

Comments (My response was: +2)

Det var pandemi, men vi var några i lektionerna som kom bra överens. Man diskutera modellerna och lär av varandra.

6. The atmosphere on the course was open and inclusive

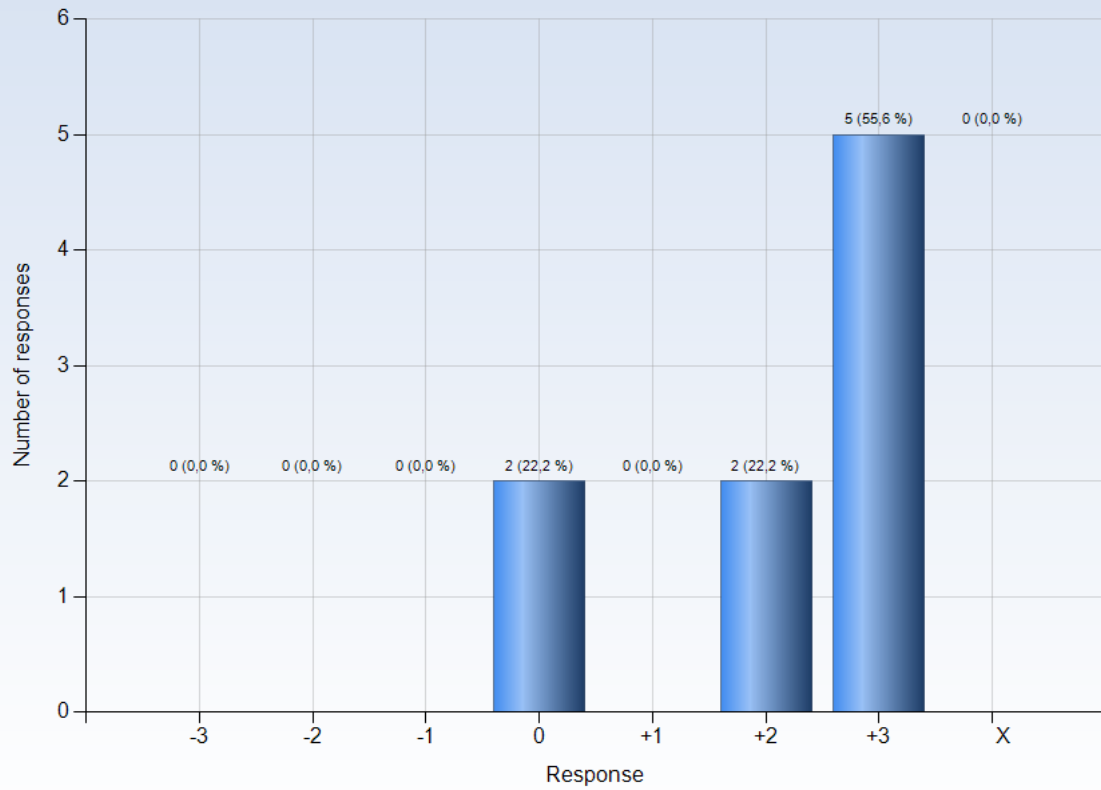


Comments

Comments (My response was: +2)

Ja

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



Comments

Comments (My response was: +2)

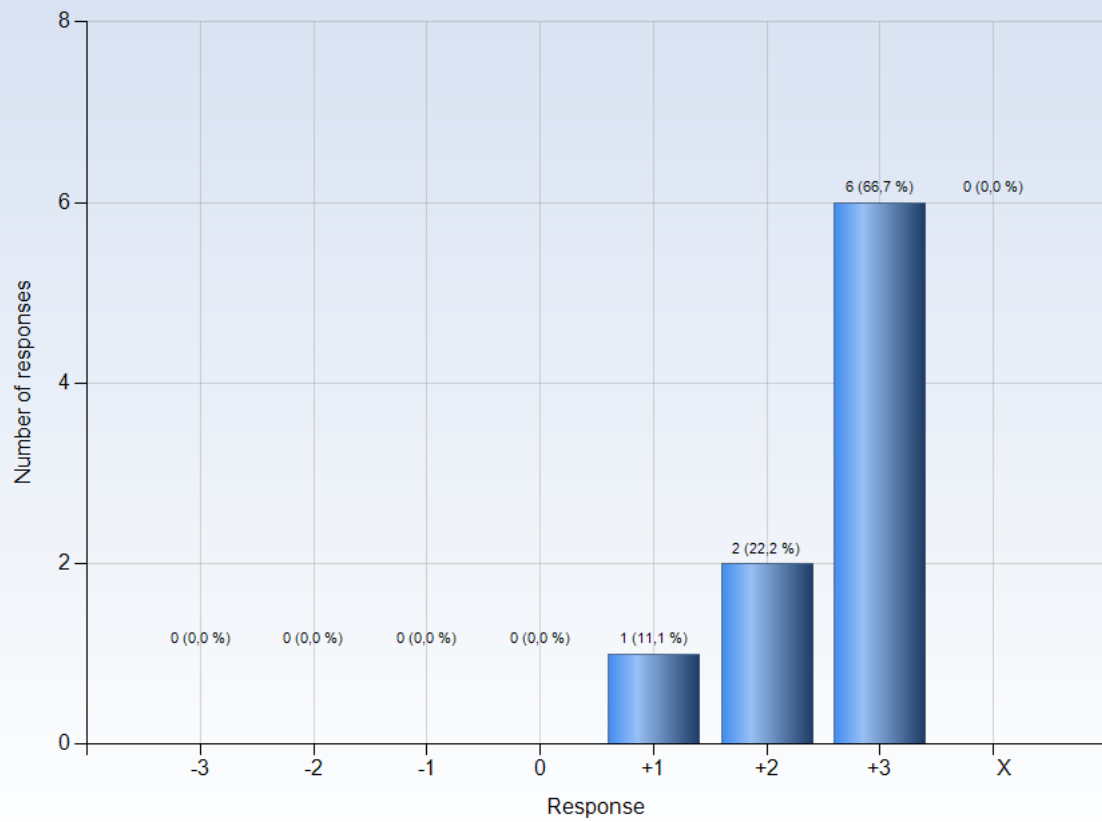
Jag visste ganska bra, men man får läsa igenom kurs pm några gånger innan man förstår helt och hållet.

8. The course was organized in a way that supported my learning



Comments

9. I understood what the teachers were talking about

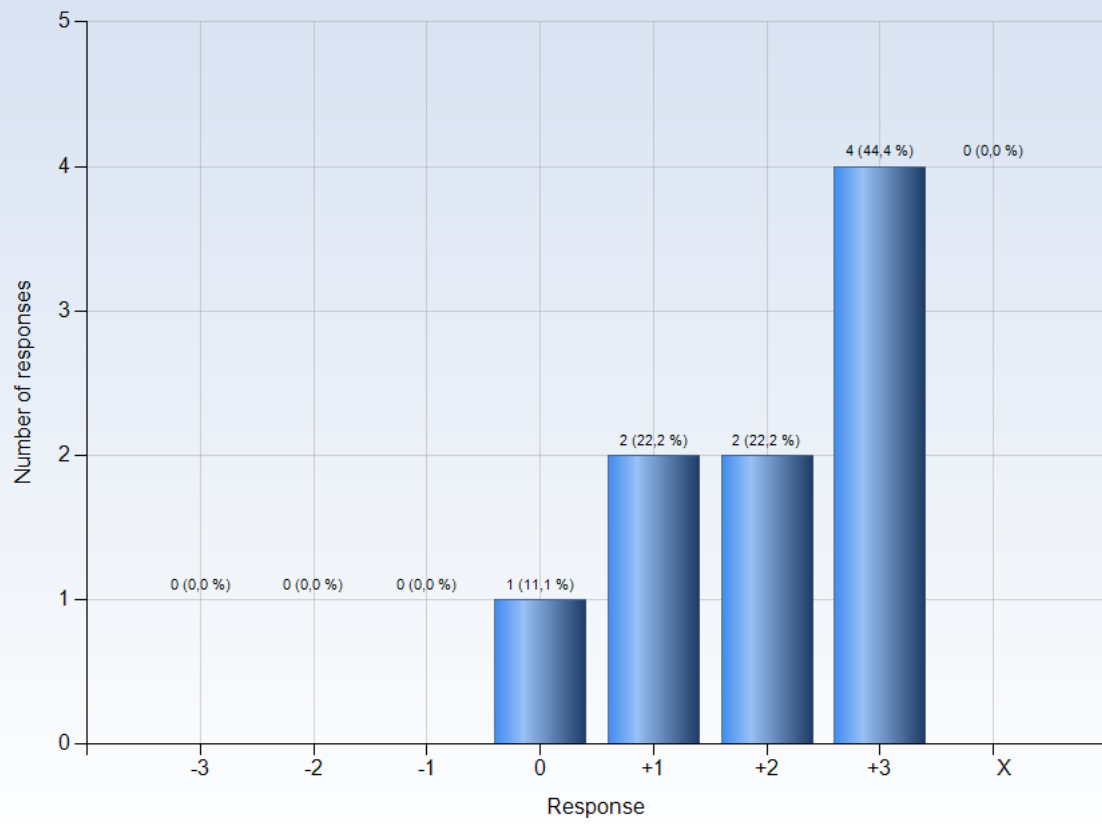


Comments

Comments (My response was: +3)

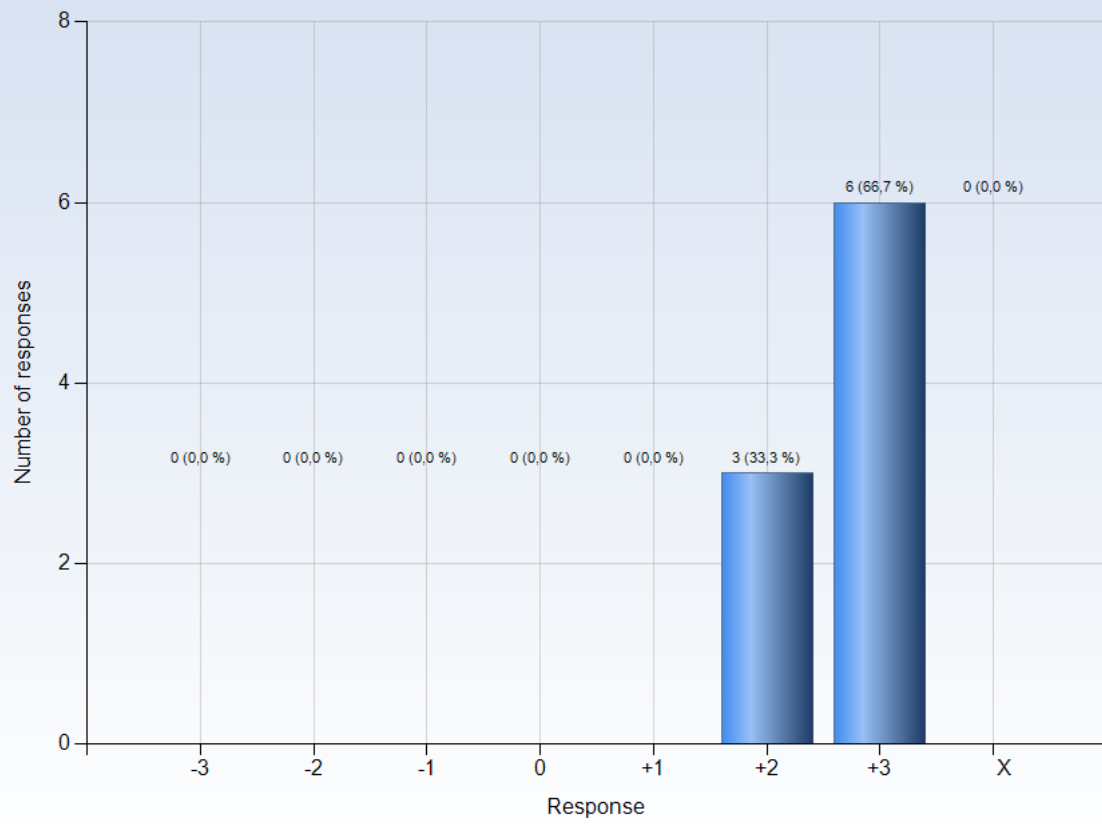
Genom att jag har stort intresse för CAD, så var det enkelt för mig att följa med vad lärarna sa.

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



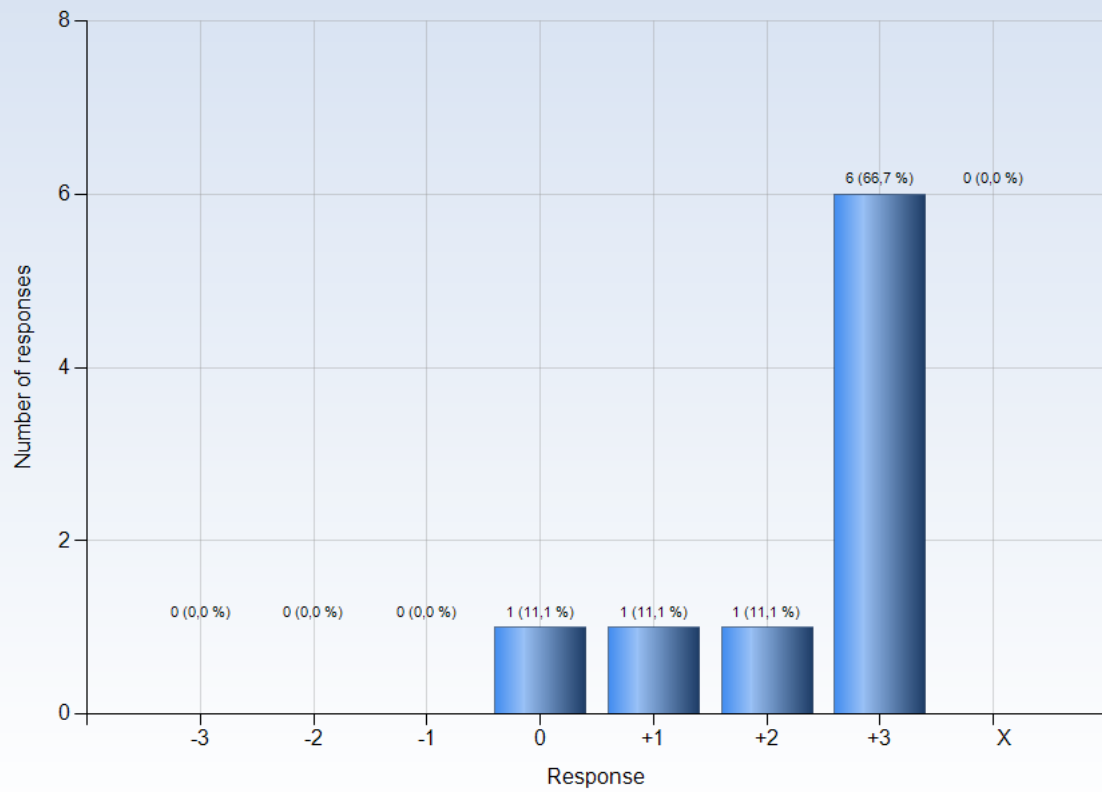
Comments

11. Understanding of key concepts had high priority



Comments

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

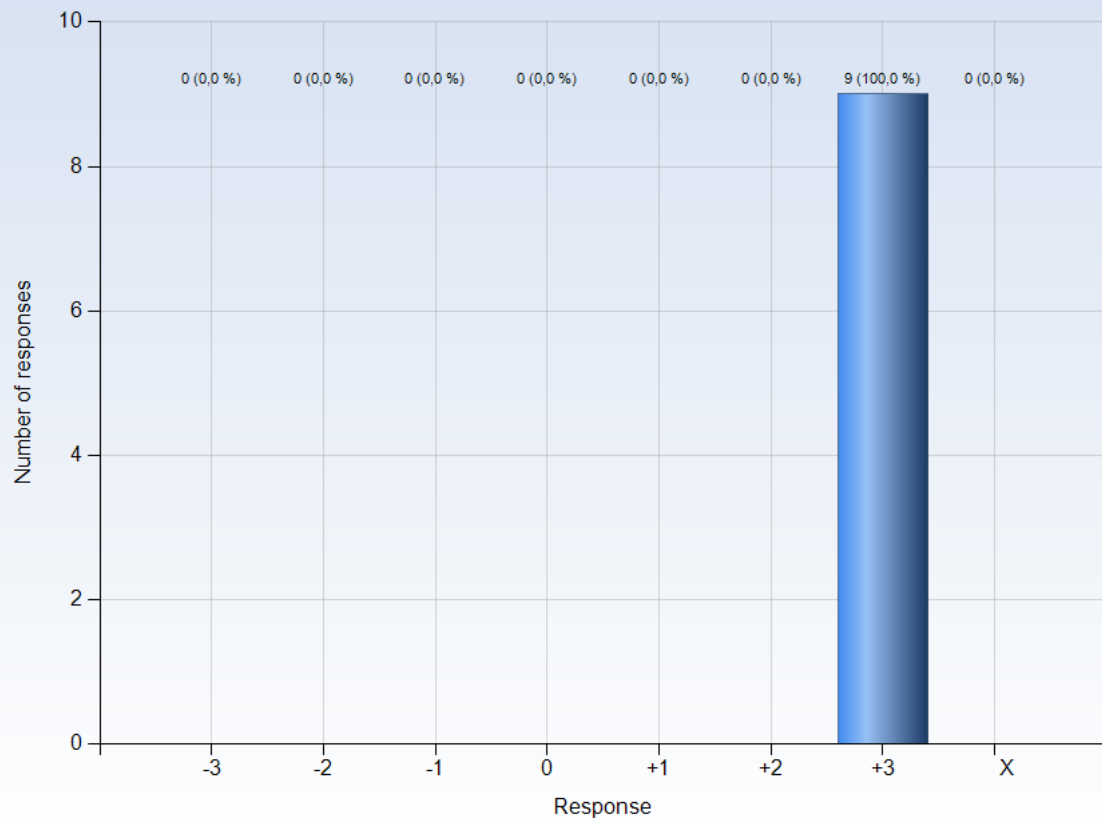


Comments

(My response was: +3)

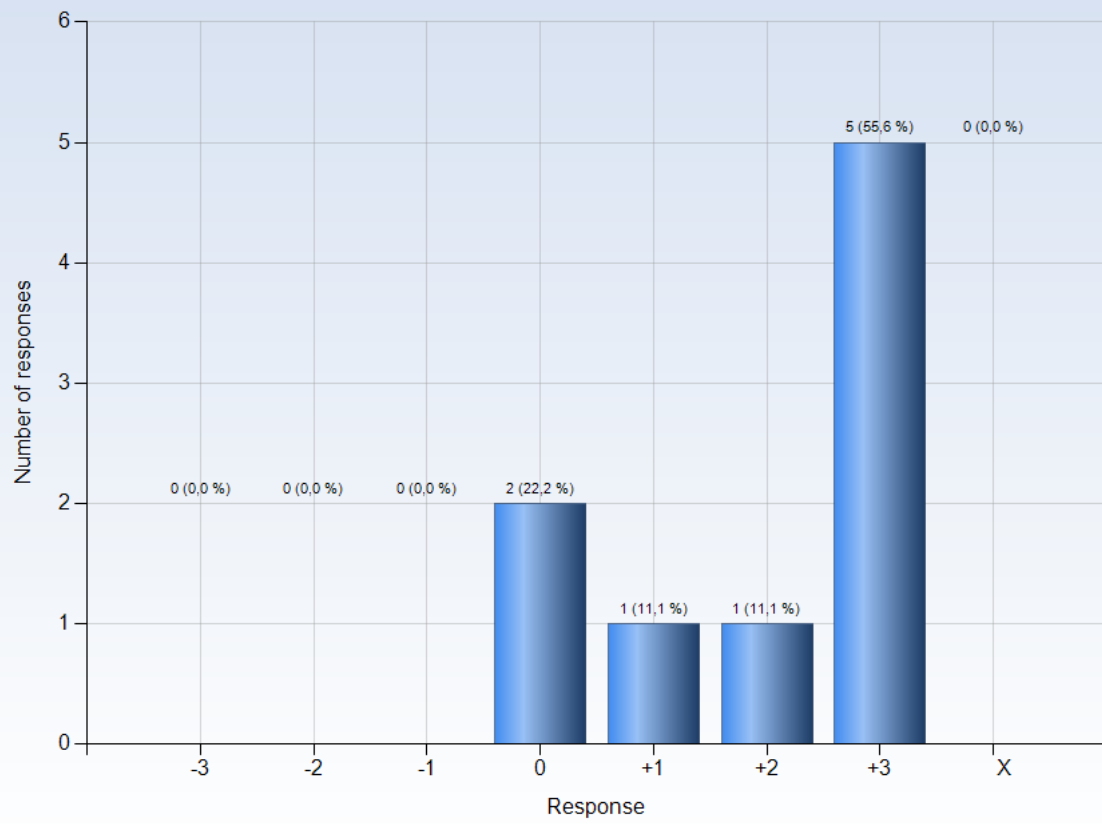
Jag tyckte väldigt mycket om hur man gick från en relativt simpel modell, till mycket mer avancerad i stegvis. Det är lätt att följa med och det blir inte för mycket.

13. I understood what I was expected to learn in order to obtain a certain grade



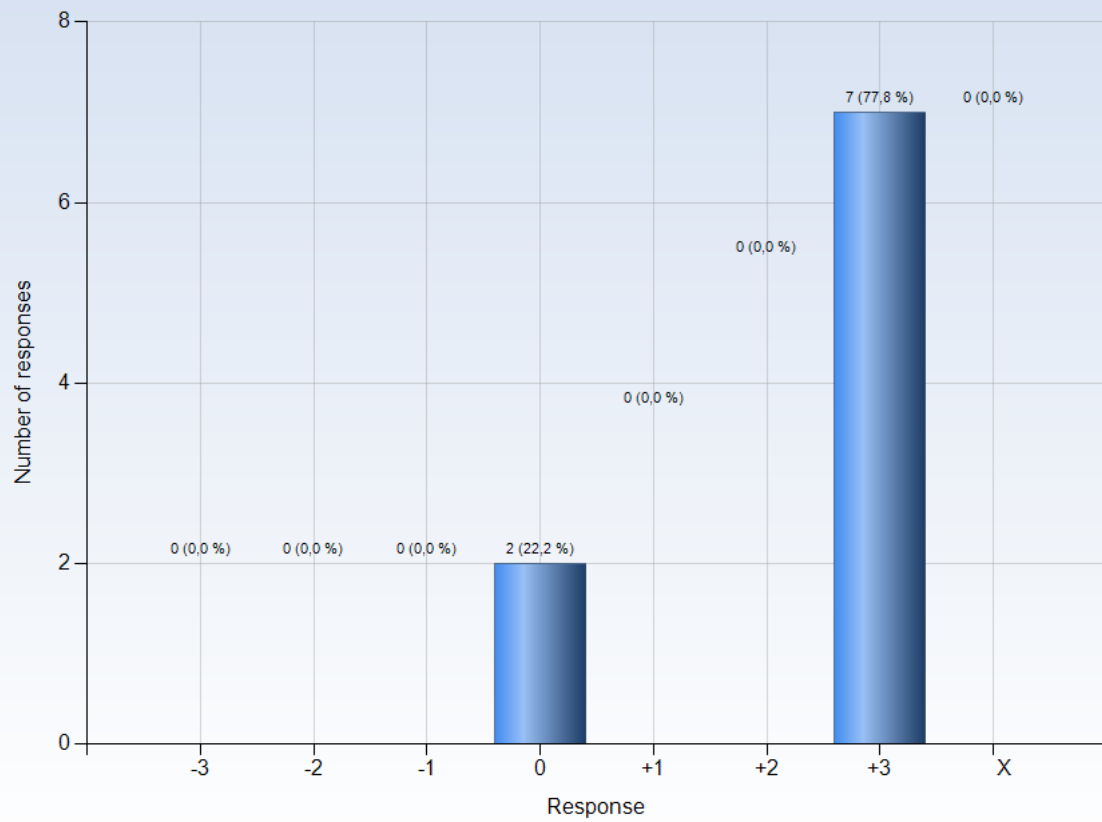
Comments

14. I received regular feedback that helped me to see my progress



Comments

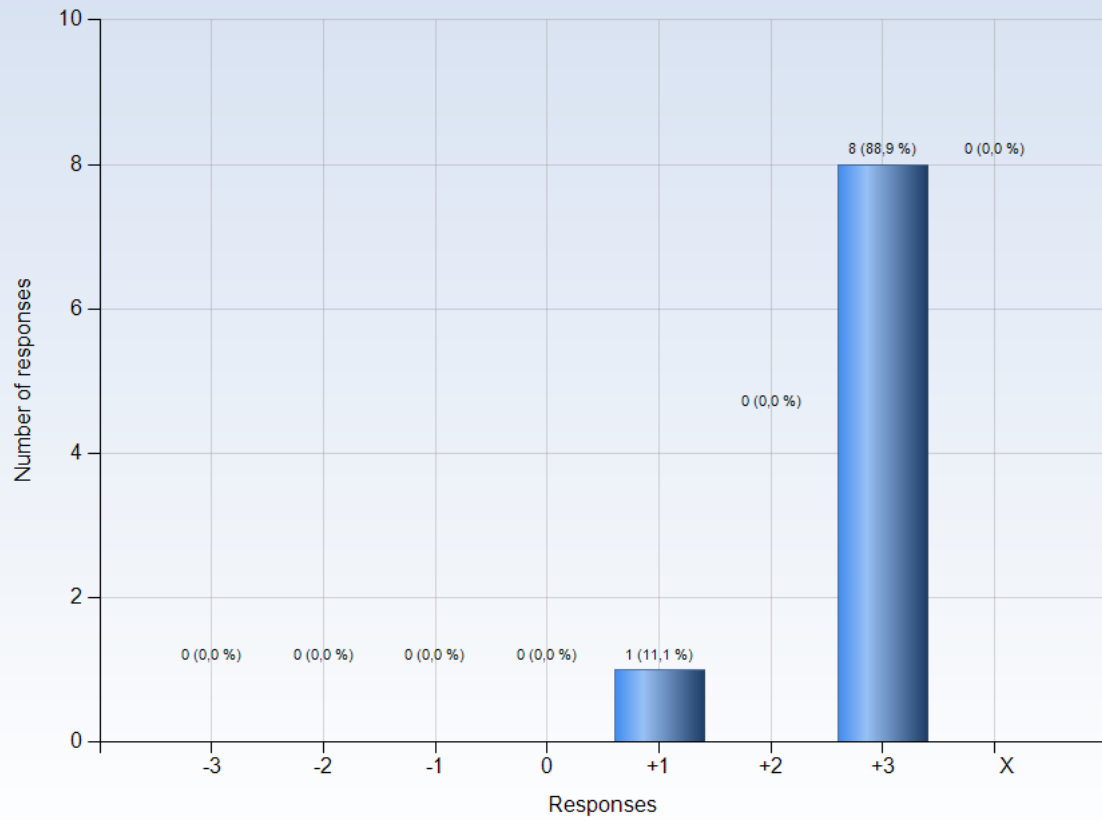
15. I could practice and receive feedback without being graded



Comments

Comments (My response was: +3)
Det är väl typ hela första perioden?

16. The assessment on the course was fair and honest

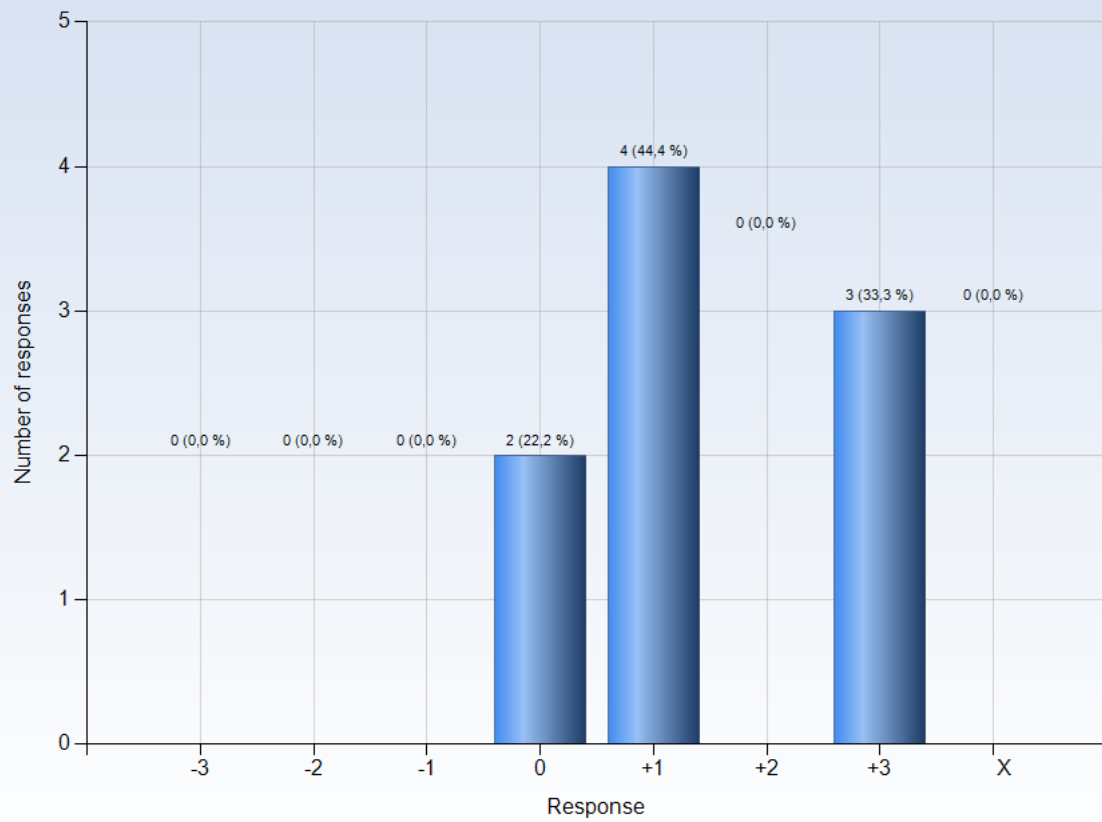


Comments

Comments (My response was: +1)

Den som gör mest inlämningar och lägger ner mest tid får högst betyg. Det borde vara mer fokus på hur bra man CADdat oavsett mängden uppgifter man gör. Det finns inga betygskrav som säger vilket betyg man borde få, de är endast baserade på mängden uppgifter man gör.

17. My background knowledge was sufficient to follow the course

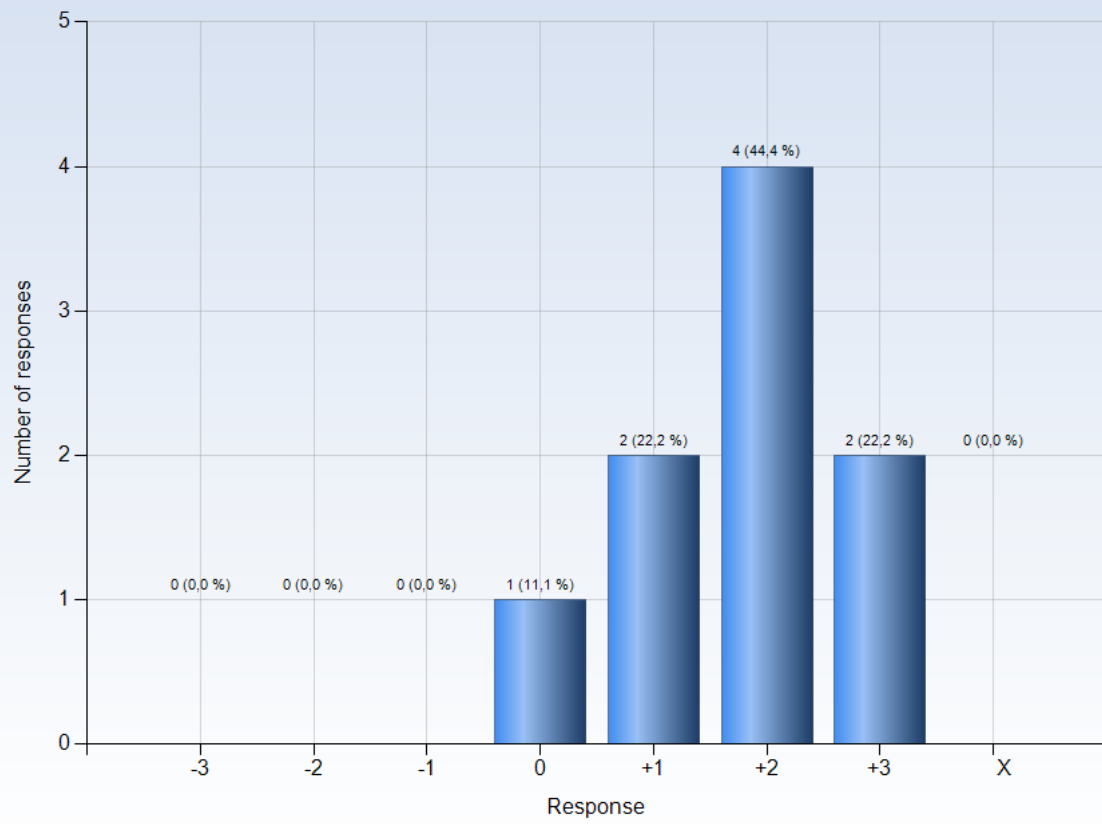


Comments

Comments (My response was: +3)

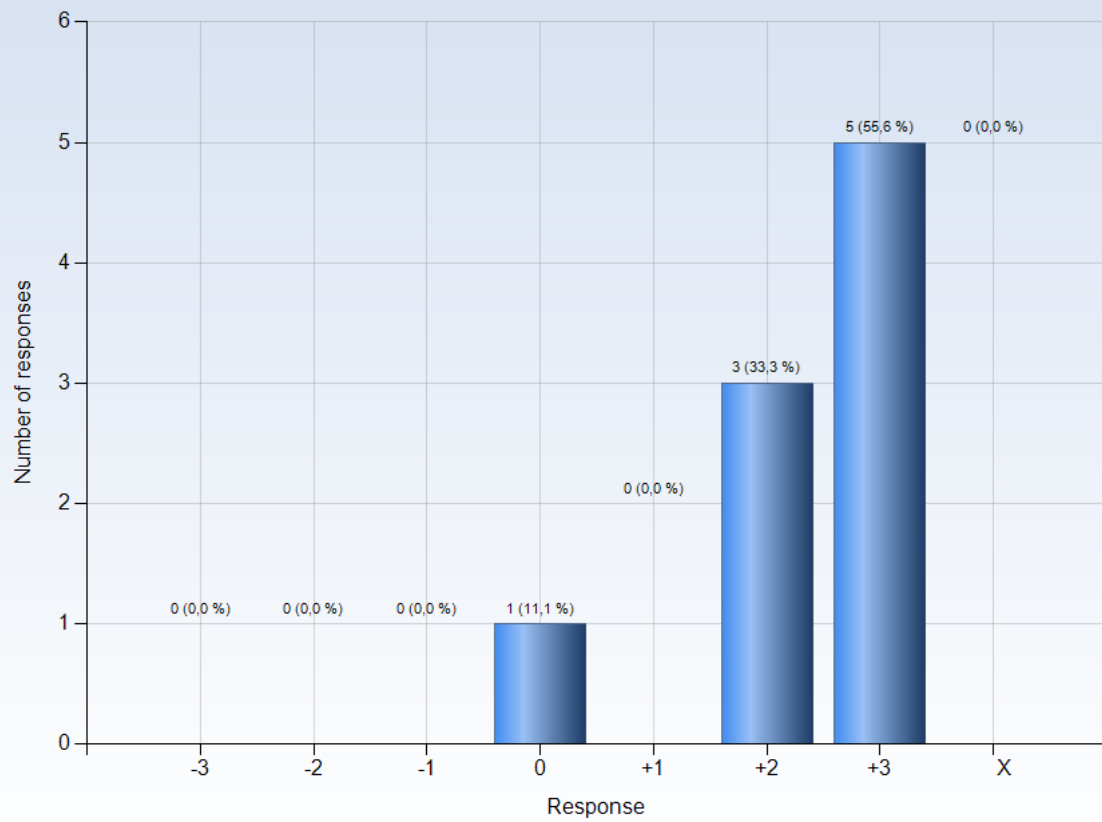
Förberedande Cad kurser hjälper väldigt mycket, då det kan bli komplicerat fort.

18. I regularly spent time to reflect on what I learned



Comments

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

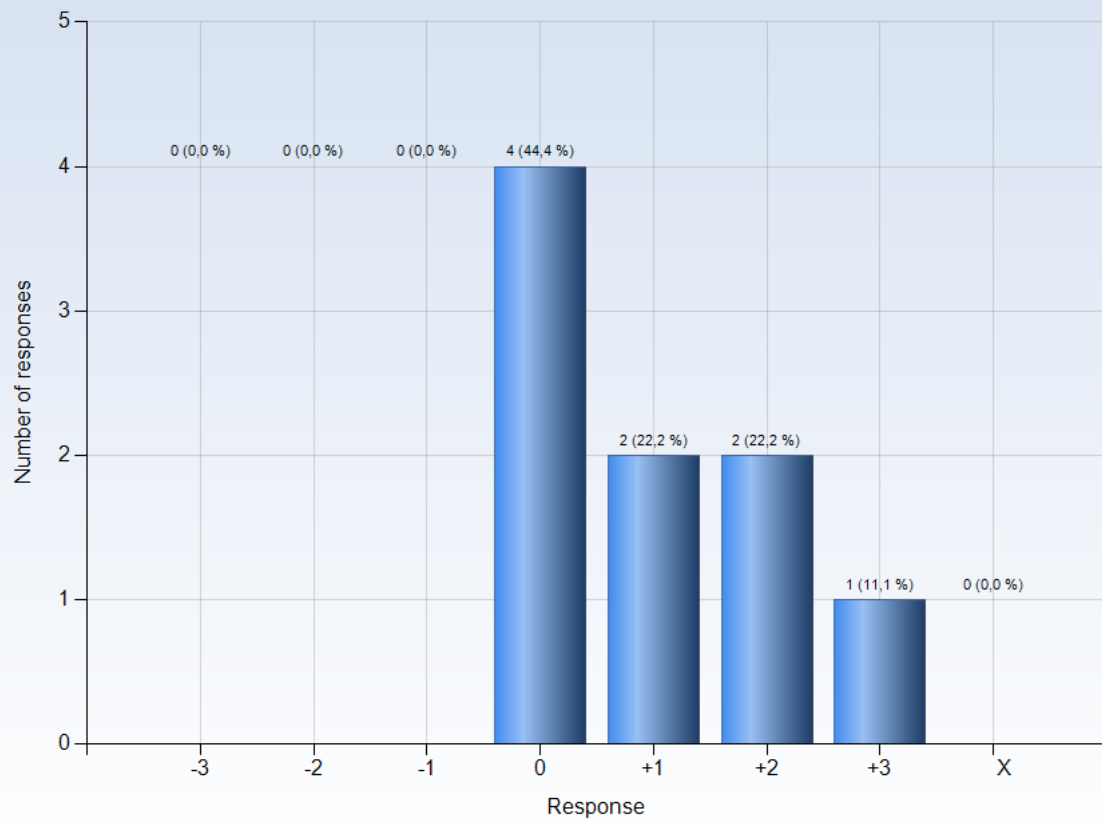


Comments

Comments (My response was: +2)

Förstår inte helt vad frågan vill komma fram till.

20. I had opportunities to influence the course activities

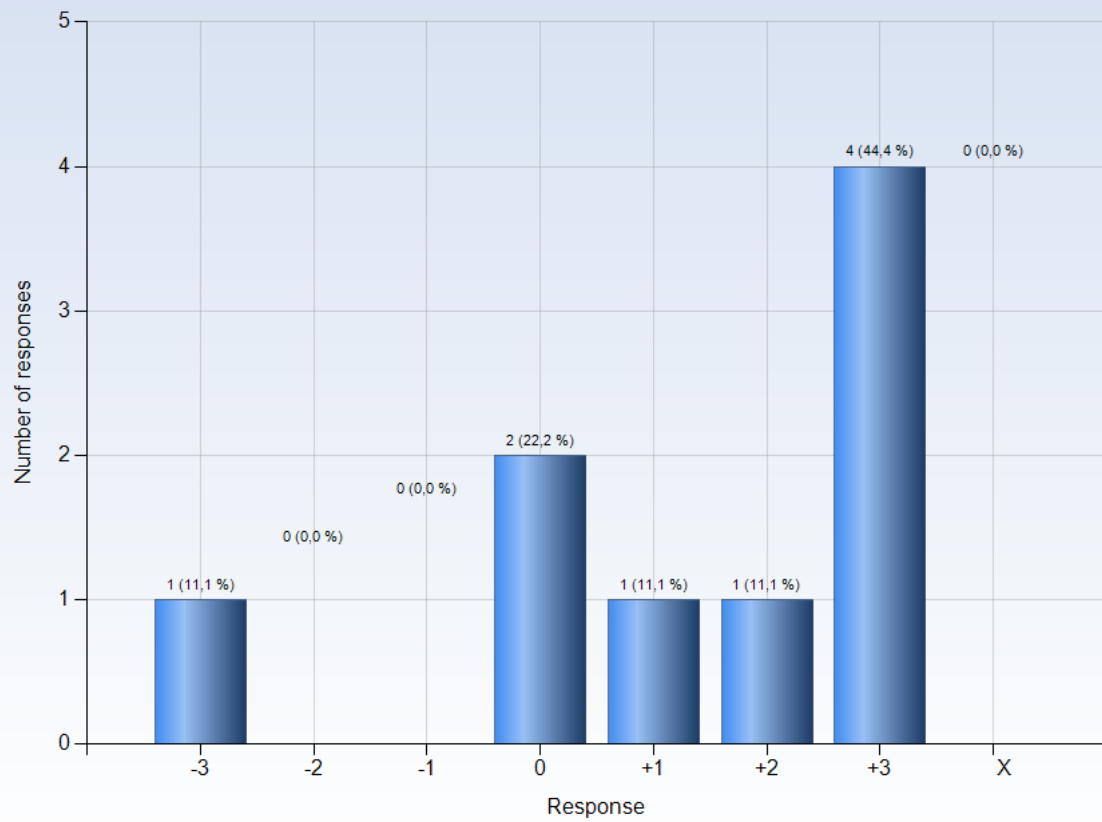


Comments

Comments (My response was: +1)

Ja, till viss del så får vi välja vilka modeller man ska tillverka.

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

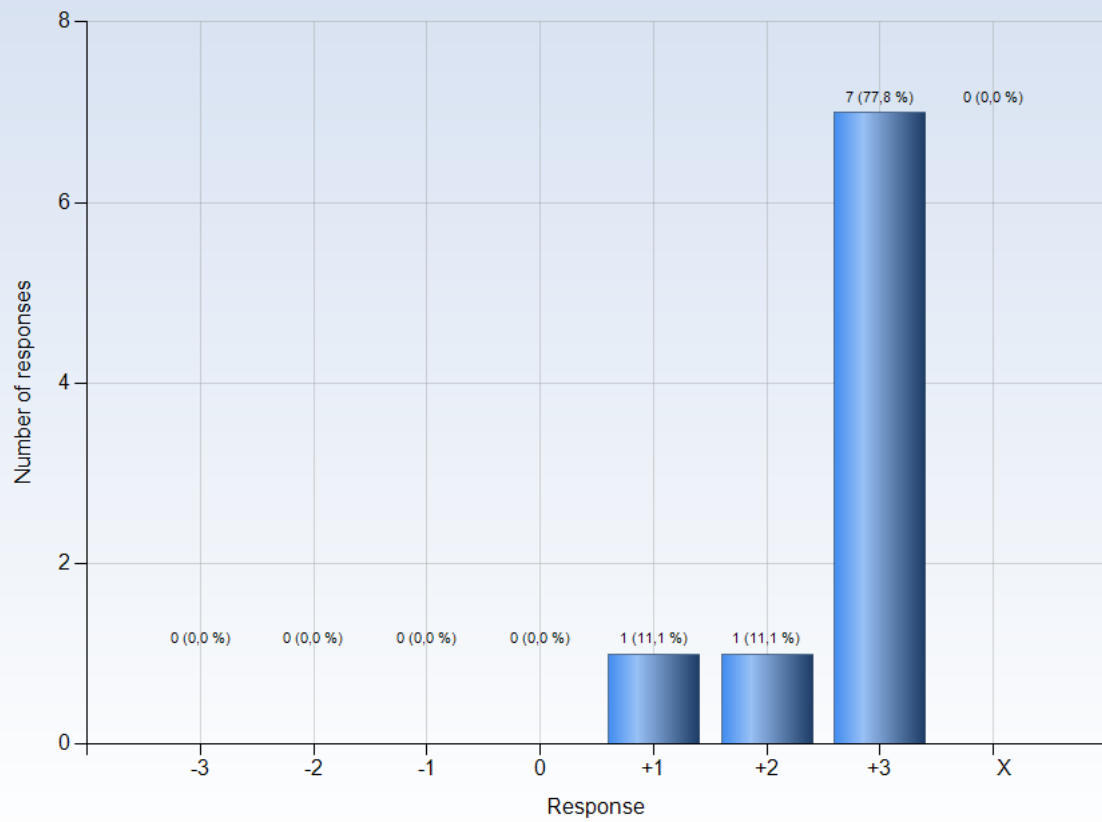


Comments

Comments (My response was: +2)

Pandemin, men under labb tillfällen så diskuterade jag med andra för just att lära mig mer.

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



Comments

Comments (My response was: +3)

Stödet fanns alltid när man behövde.