Report - SF2822 - 2016-06-21

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):
Anders Forsgren, andersf@kth.se

COURSE DESIGN
Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.
The course is designed around two projects and lectures/exercise sessions. The projects are carried out in groups, and the students use a high-level optimization modeling language, GAMS. Modeling is examined throught the projects, theory and method knowledge is examined through the final exam. Method knowledge is optionally examined through the second project. This is the same setup as last year.

THE STUDENT'S 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?
The expected workload would be 20 hours per week. The questionnaire shows a lower load. I think it differs depending on the students' background. Also, I think it is difficult for them to estimate how much time they spend on the projects.

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?
In the projects, the students did well. The overall result was comparable to earlier years.

OVERALL IMPRESSION OF THE LEARNING ENVIRONMENT
What is your overall impression of the learning environment in the polar diagrams, for example in terms of the students' experience of meaningfulness, comprehensibility and manageability? If there are significant differences between different groups of students, what can be the reason?
The overall impression based on the polar diagrams is that this is a well functioning learning environment.
Female students give lower score on exploration of subject on their own. I cannot explain this deviation.

ANALYSIS OF THE LEARNING ENVIRONMENT
Can you identify some stronger or weaker areas of the learning environment in the polar diagram - or in the response to each statement - respectively? Do they have an explanation?
Stronger aspects concern support, stimulating tasks, clear goals and organization, constructive alignment, feedback and security. Weaker aspects concern choices and exploration and own experience.
I think the main strengths of the course are based on the projects, the students are well motivated and work hard. As for the weaknesses, I assign the groups and also assign the tasks to each group. This is a choice on my part. Assigning groups is important. Letting the groups choose projects might be difficult to handle. There is a choice between modeling and method assignment in project two.

ANSWERS TO OPEN QUESTIONS
What emerges in the students' answers to the open questions? Is there any good advice to future course participants that you want to pass on?

The students are in general quite happy with the course. In particular, they appreciate the work with the projects.

PRIORITY COURSE DEVELOPMENT
What aspects of the course should primarily be developed? How could these aspects be developed in the short or long term?

The course has a working setup and I do not plan any major changes right now.
Minor changes would be to announce in advance which exercises to be handled at the exercise session, and also to develop new projects.
Another point would be to change the way the students assess their own workload in the projects.

OTHER INFORMATION
Is there anything else you would like to add?

The results from the course evaluation are very much in line with my own view of the course. Axel Ringh did a very good job as teaching assistant.

Course data

SF2822 - Applied Nonlinear Optimization, VT 2016

Course facts

Course start:	2016 w.13
Course end:	2016 w.23
Credits:	7,5
Examination:	PRO1 - Project, 1.5, Grading scale: A, B, C, D, E, FX, F
	PRO2 - Project, 1.5, Grading scale: A, B, C, D, E, FX, F
	TEN1 - Examination, 4.5, Grading scale: A, B, C, D, E, FX, F
Grading scale:	A, B, C, D, E, FX, F

Staff

Examiner:	Anders Forsgren <andersf@kth.se>
Course responsible teacher:	Anders Forsgren <andersf@kth.se>
Teachers:	Anders Forsgren <andersf@kth.se>
	Axel Ringh <aringh@kth.se>
Assistants:	

Number of students on the course offering

First-time registered:	45
Total number of registered:	48

Achievements (only first-time registered students)

Pass ratio[1] [%]	60.00%
Grade distribution[2] [%, number]	A 26% (7)
	B 48% (13)
	C 22% (6)
	D 4% (1)
Achievement ratio[3] [%]	39.10%

1 Percentage approved students
2 Distribution of grades among the approved students
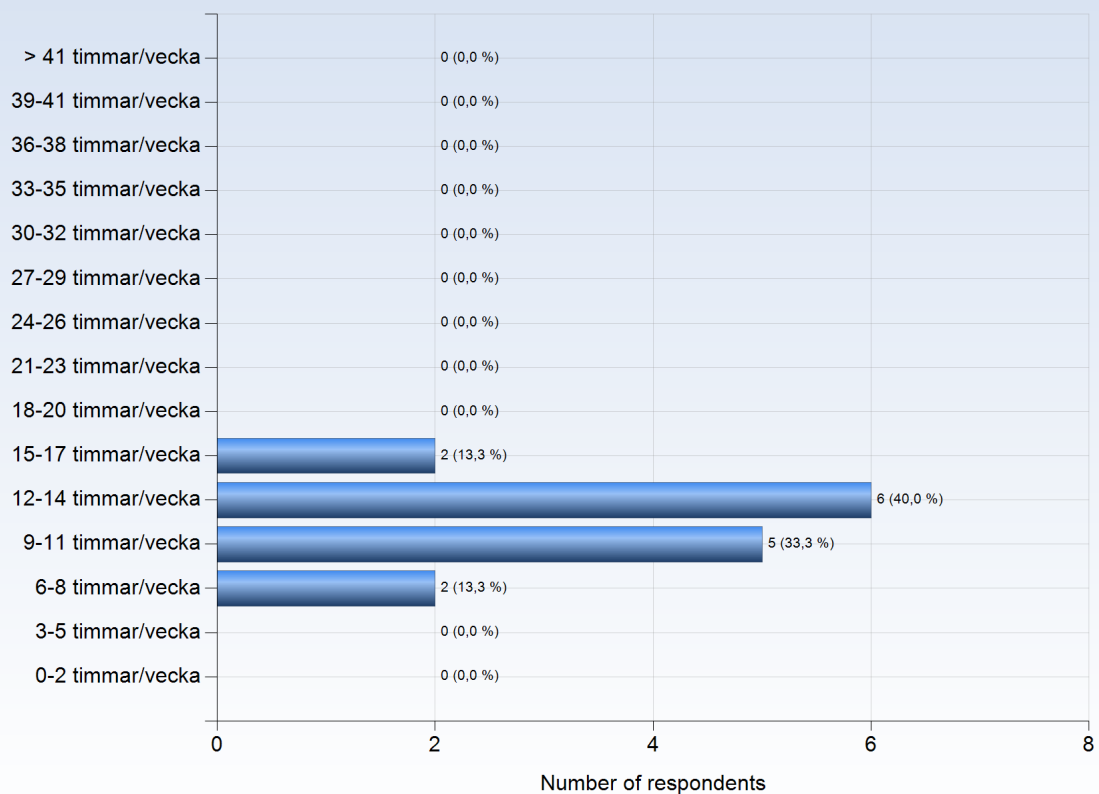3 Percentage achieved credits

Antal respondenter: 45
Antal svar: 15
Svarsfrekvens: 33,33 %

ESTIMATED WORKLOAD

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

Category	Value
> 41 timmar/vecka	0 (0,0 %)
39-41 timmar/vecka	0 (0,0 %)
36-38 timmar/vecka	0 (0,0 %)
33-35 timmar/vecka	0 (0,0 %)
30-32 timmar/vecka	0 (0,0 %)
27-29 timmar/vecka	0 (0,0 %)
24-26 timmar/vecka	0 (0,0 %)
21-23 timmar/vecka	0 (0,0 %)
18-20 timmar/vecka	0 (0,0 %)
15-17 timmar/vecka	2 (13,3 %)
12-14 timmar/vecka	6 (40,0 %)
9-11 timmar/vecka	5 (33,3 %)
6-8 timmar/vecka	2 (13,3 %)
3-5 timmar/vecka	0 (0,0 %)
0-2 timmar/vecka	0 (0,0 %)

Number of respondents

Comments

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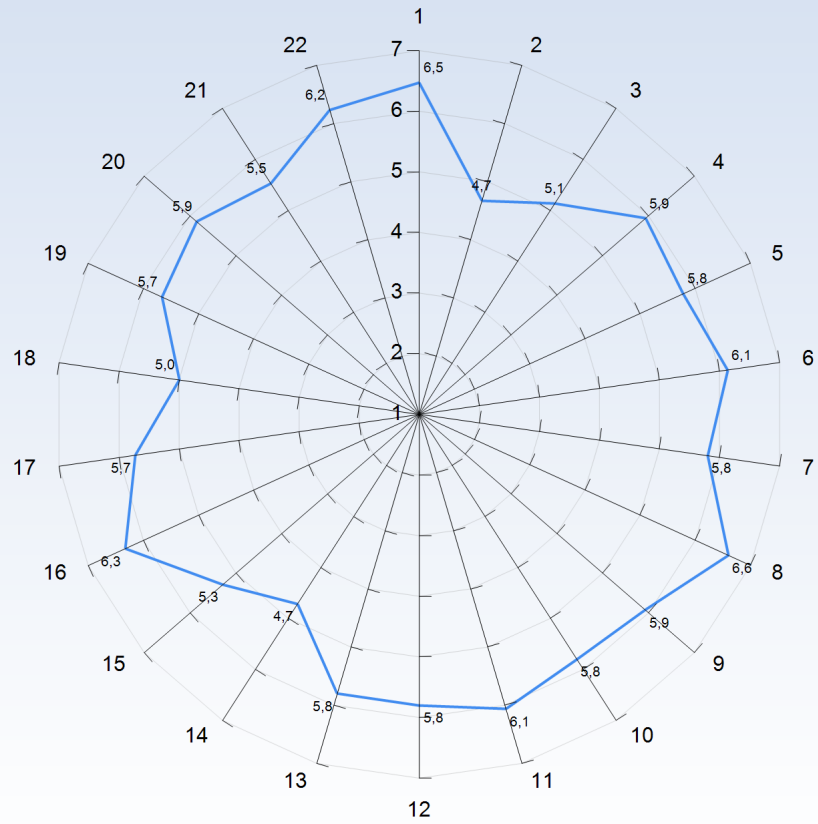
1 = No, I strongly disagree with the statement
4 = I am neutral to the statement
7 = Yes, I strongly agree with the statement

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 v3.1.1

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 could 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 other course participants (d)
6. The atmosphere in the course was open and inclusive (d)

Comprehensibility - cognitive level

Clear goals and organization

7. The learning objectives helped me understand what I was expected to achieve (e)
8. I understood how the course was organized and what I was expected to do (e)

Understanding of subject matter

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

Constructive alignment

12. The course activities helped me to reach the learning objectives efficiently (i)
13. I understood what I was expected to learn in order to get a particular grade (i)

Feedback and security

14. I regularly received feedback that helped me see my progress (j)
15. I could practice and receive feedback without any grading being done (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 choices

19. I could learn in a way that suited me (m)
20. I had opportunities to choose what I was going to do (m)

Collaboration

21. I could learn by collaborating and discussing with others (n)

Support

22. I could 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, act or feel) when:

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

b) We can speculate, try out 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 yet supportive environment

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

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

f) We have sufficient background knowledge to manage the present learning situation

g) We can learn inductively by moving from specific examples and experiences to general principles, rather than the other way around

h) We are challenged to develop a proper understanding of key concepts and successively create a coherent whole of the content

i) We believe that the work we are expected to do will help us to reach the learning objectives

j) We can try, fail, and receive feedback in advance of and separate from any summative judgment of our efforts

k) We believe that our work will be considered fairly and honestly

l) We have sufficient time to learn and devote the time necessary to do so

m) We believe that we are in control of our own learning, not manipulated

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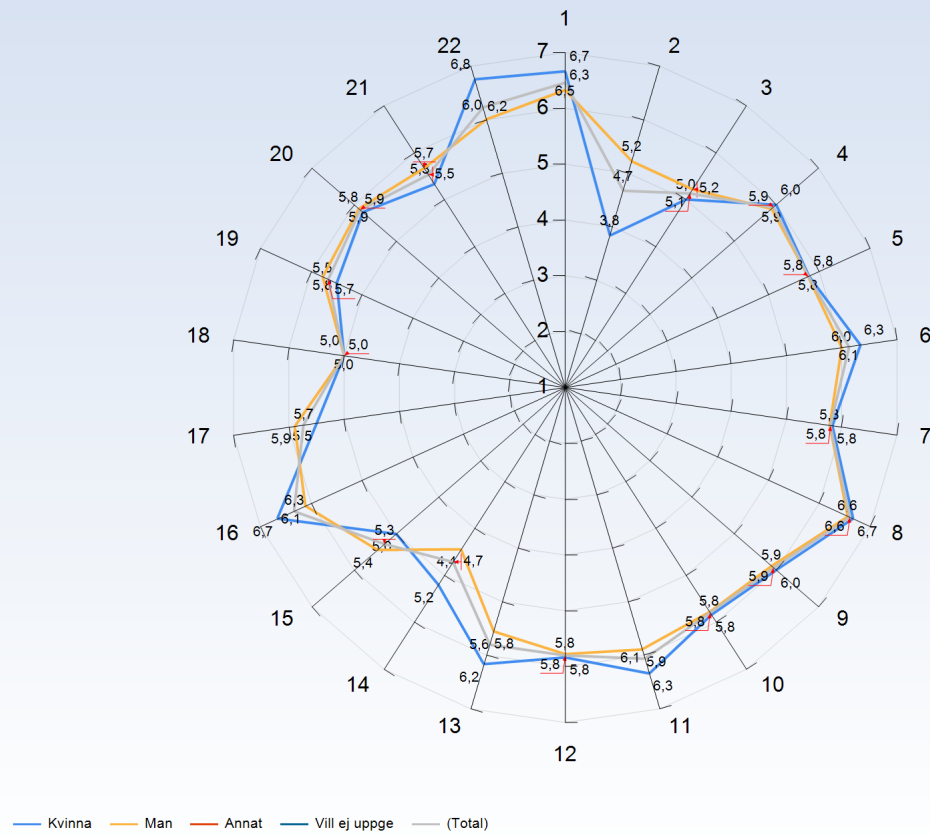
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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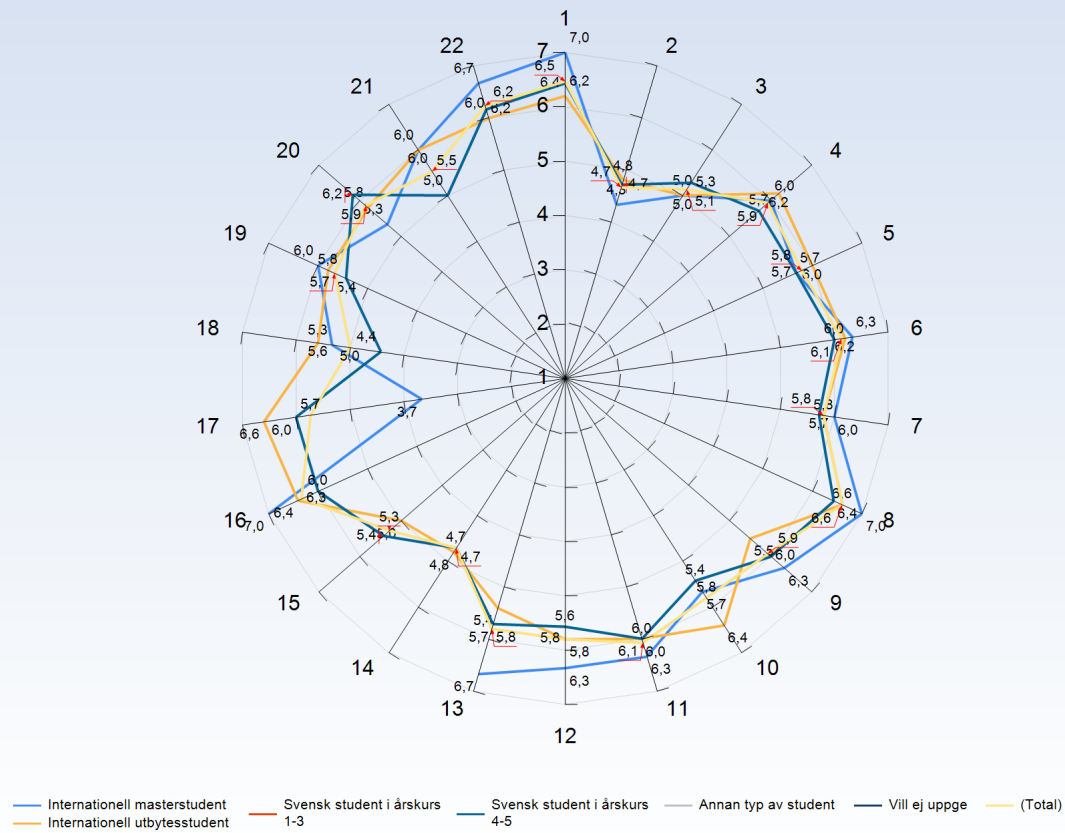
Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.

Average response to LEQ statements - per gender

Legend: Kvinna | Man | Annat | Vill ej uppge | (Total)

Comments

Average response to LEQ statements - per type of student

Legend:
- Internationell masterstudent
- Internationell utbytesstudent
- Svensk student i årskurs 1-3
- Svensk student i årskurs 4-5
- Annan typ av student
- Vill ej uppge
- (Total)

Comments

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 6-8 timmar/vecka)
The implementation part, which was a good way to try the optimization methods taught on slightly larger problems than the textbook ones.
Also, the open question on the first homework, where you go to practice thinking "outside of the box".

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)
The teacher and the TA are great!
Projects
The projects help me a lot

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)
The exercices with Axel were very helpful.
It was well structured, projects helped understand the material better as well as exercise sessions.
Interesting projects, good organized
The Prof. and the TA. Seing the similarities of the methods.
the course was really well structured : theory and then methods for implementation. best part was the methods.
The projects were good. you used your knowledge from the course in real world situations.

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)
Projekten
The projects are very interesting, especially the second one (implementation).

What would you suggest to improve?

What would you suggest to improve? (I worked: 6-8 timmar/vecka)
The group work. All tasks should be compulsory and not only the basic ones.
Add more examples of when the optimization methods are used in current research and more "real-life"-examples.

What would you suggest to improve? (I worked: 9-11 timmar/vecka)
The projects can be more related to the theories

What would you suggest to improve? (I worked: 12-14 timmar/vecka)
A bit more aid with the theory questions.
Although the book helped a little in understanding but there was no clear guidence of what chapters are going to be covered.
Allowing a (1 page or even preprinted) formula sheet for the exam would help, as large equation systems were required for some methods. (If deriving this equations from the basic optimality conditions should be part of the exam, it could be asked for in a special task)
When the optimality conditions have been deduced, maybe a recap slide with them all in a list, like the one presented on the excercisen class.
maybe skip the last part on the semi-definite programming and introduce the heuristics and meta-heuristics algorithms

What would you suggest to improve? (I worked: 15-17 timmar/vecka)
En KS eller frivillig hemuppgift i början av kursen som bara fokuserar på optimeringsvillkoren skulle göra hela kursen lättare.

What advice would you like to give to future course participants?

What advice would you like to give to future course participants? (I worked: 6-8 timmar/vecka)
Do the theory questions and understand them
Look at the theory questions early and ask about them if you cannot solve them. It is not good to leave them until the last week!

What advice would you like to give to future course participants? (I worked: 9-11 timmar/vecka)
Dont miss the exercise sessions, they make you understand and apply the concepts of the lectures.
Study hard and you will achieve a lot from the course

What advice would you like to give to future course participants? (I worked: 12-14 timmar/vecka)
Do theory questions throughout the course.
Go to lectures and exercise sessions because they are very helpful in understanding the material.
Prepare the lectures beforehand
Choosing the implementation project helped to understand the theory better
Start early with the projects.
Spend time on the projects but make sure to keep up with the theory throughout the course

What advice would you like to give to future course participants? (I worked: 15-17 timmar/vecka)
Det finns en anledning att så mycket tid i början av kursen läggs på optimeringsvillkor. De är viktiga. Förstå dem!

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 9-11 timmar/vecka)
No

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)
Interesting and well-organized course all in all.
Lectures were sometimes hard to follow - the short repetitions at the beginning of some exercise sessions were very useful.
Nice course.
Both Anders and Axel were very good! A well organized and fun course!

Is there anything else you would like to add? (I worked: 15-17 timmar/vecka)
Väldigt tydlig kontakt med Anders och Axel. Det var lätt att komma och prata eller få snabba svar på mail.

SPECIFIC QUESTIONS

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
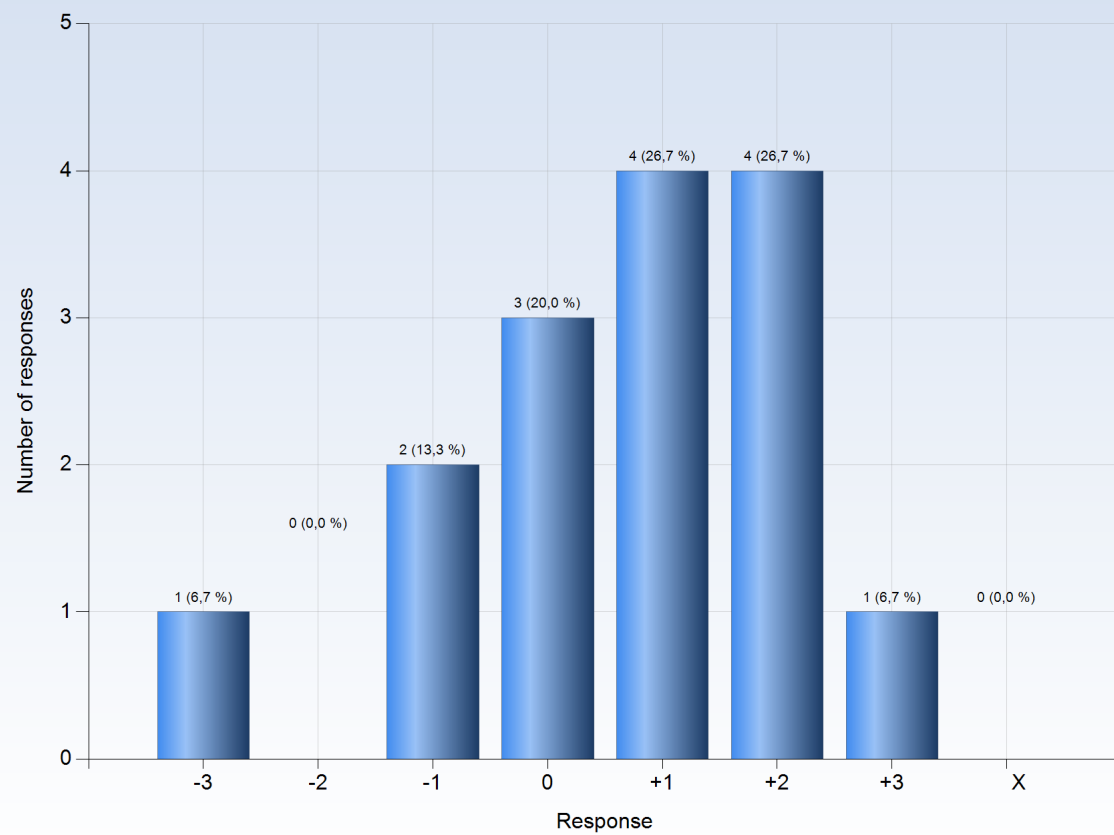+3 = Yes, I strongly agree with the statement

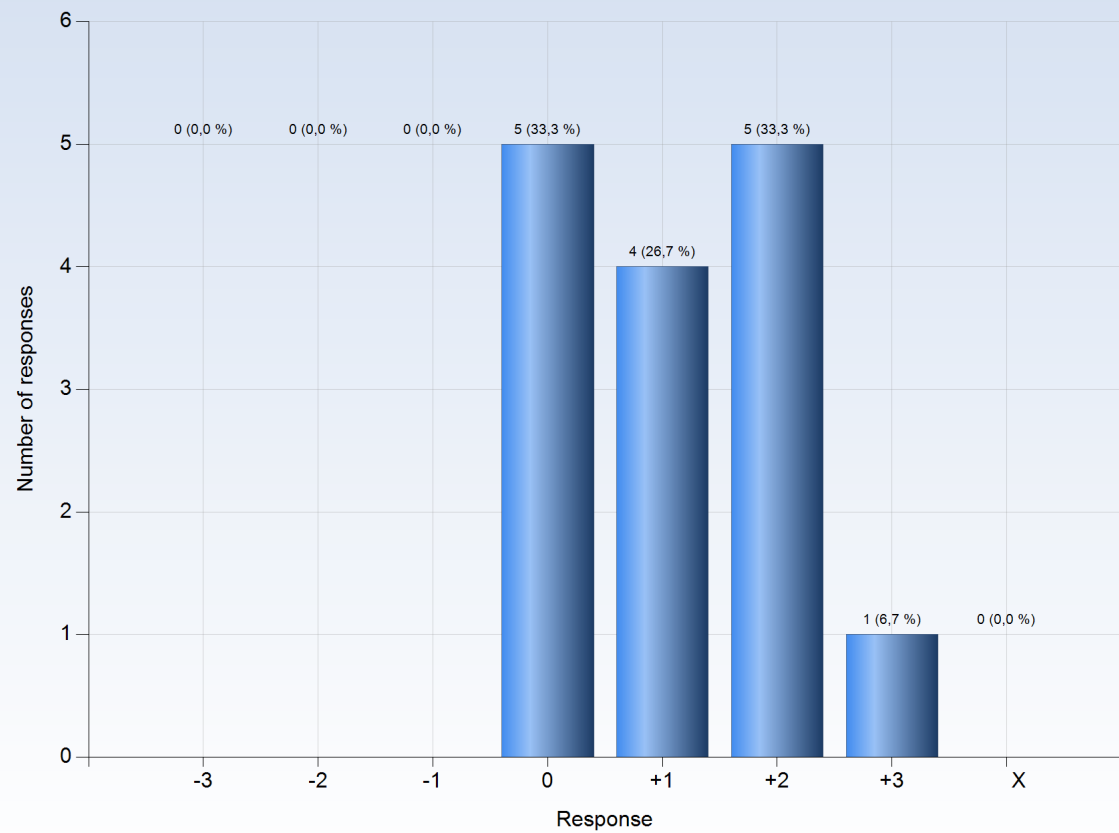X = I decline to take a position on the statement

1. I worked with interesting issues

Response	Number of responses
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	0 (0,0 %)
0	0 (0,0 %)
+1	1 (6,7 %)
+2	6 (40,0 %)
+3	8 (53,3 %)
X	0 (0,0 %)
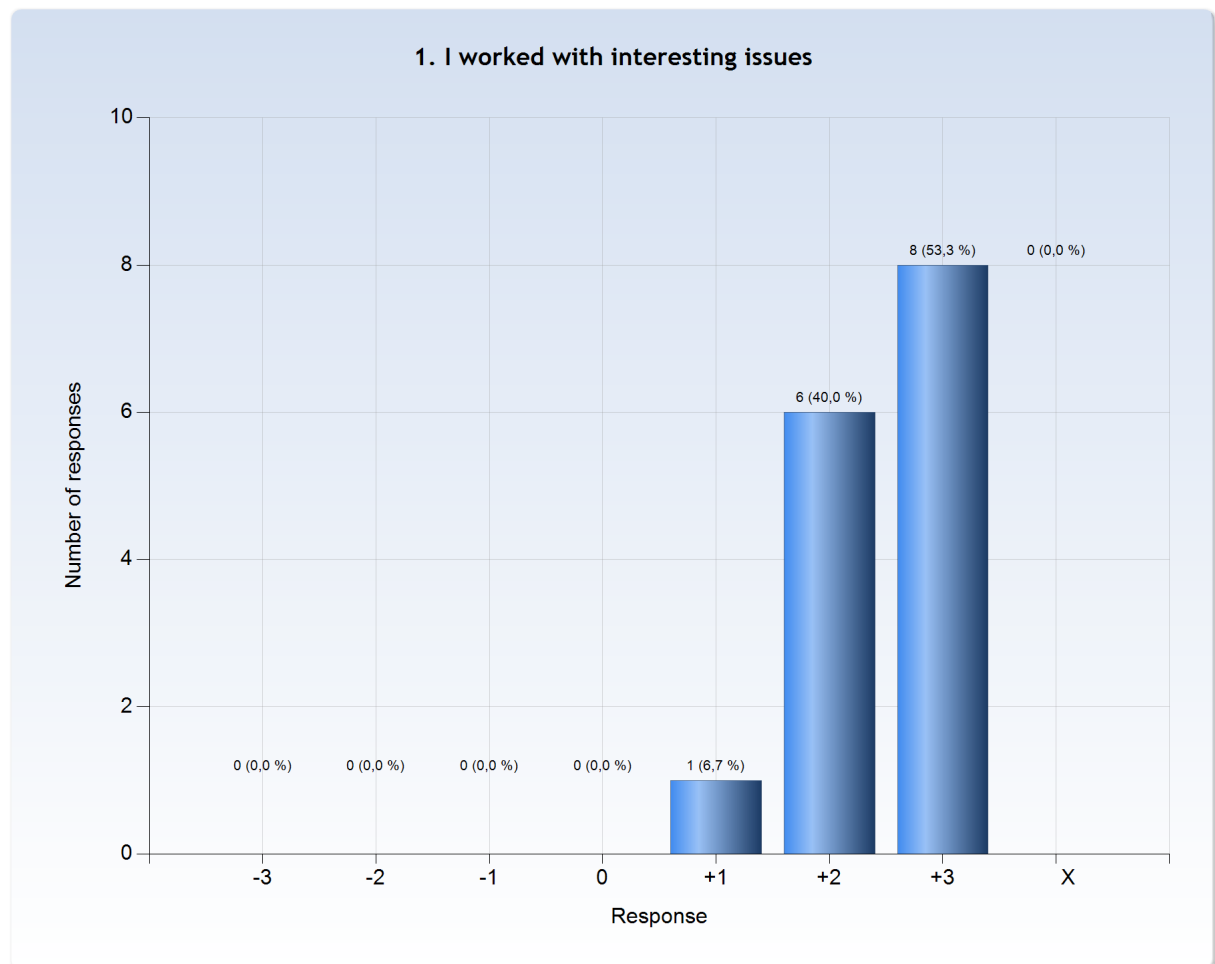
Comments

2. I explored parts of the subject on my own

Number of responses

1 (6,7 %)   0 (0,0 %)   2 (13,3 %)   3 (20,0 %)   4 (26,7 %)   4 (26,7 %)   1 (6,7 %)   0 (0,0 %)

-3   -2   -1   0   +1   +2   +3   X

Response

Comments

3. I could learn by trying out my own ideas

Number of responses

Response	Count
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	0 (0,0 %)
0	5 (33,3 %)
+1	4 (26,7 %)
+2	5 (33,3 %)
+3	1 (6,7 %)
X	0 (0,0 %)

Comments

4. The course was challenging in a stimulating way

Number of responses

Response	
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	0 (0,0 %)
0	1 (6,7 %)
+1	1 (6,7 %)
+2	11 (73,3 %)
+3	2 (13,3 %)
X	0 (0,0 %)
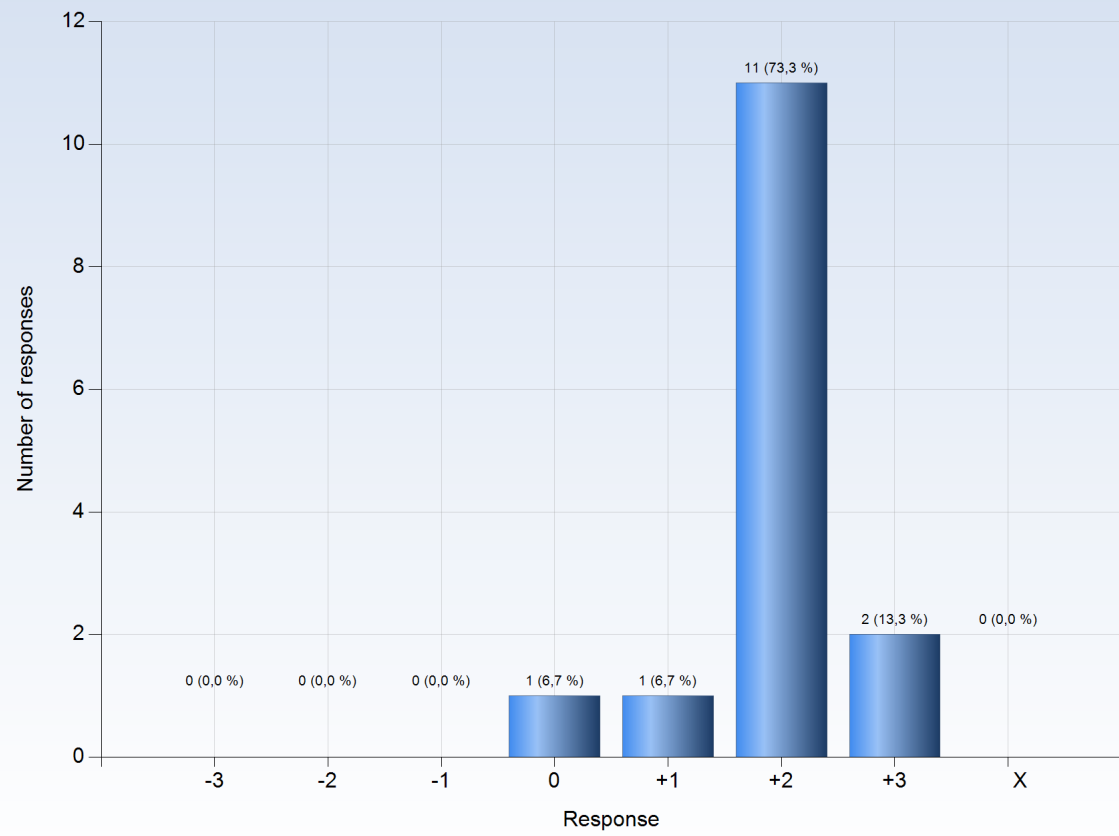
Comments

5. I felt togetherness with other course participants

Number of responses vs Response

Response	-3	-2	-1	0	+1	+2	+3	X
	0 (0,0 %)	0 (0,0 %)	1 (7,1 %)	1 (7,1 %)	1 (7,1 %)	8 (57,1 %)	3 (21,4 %)	0 (0,0 %)
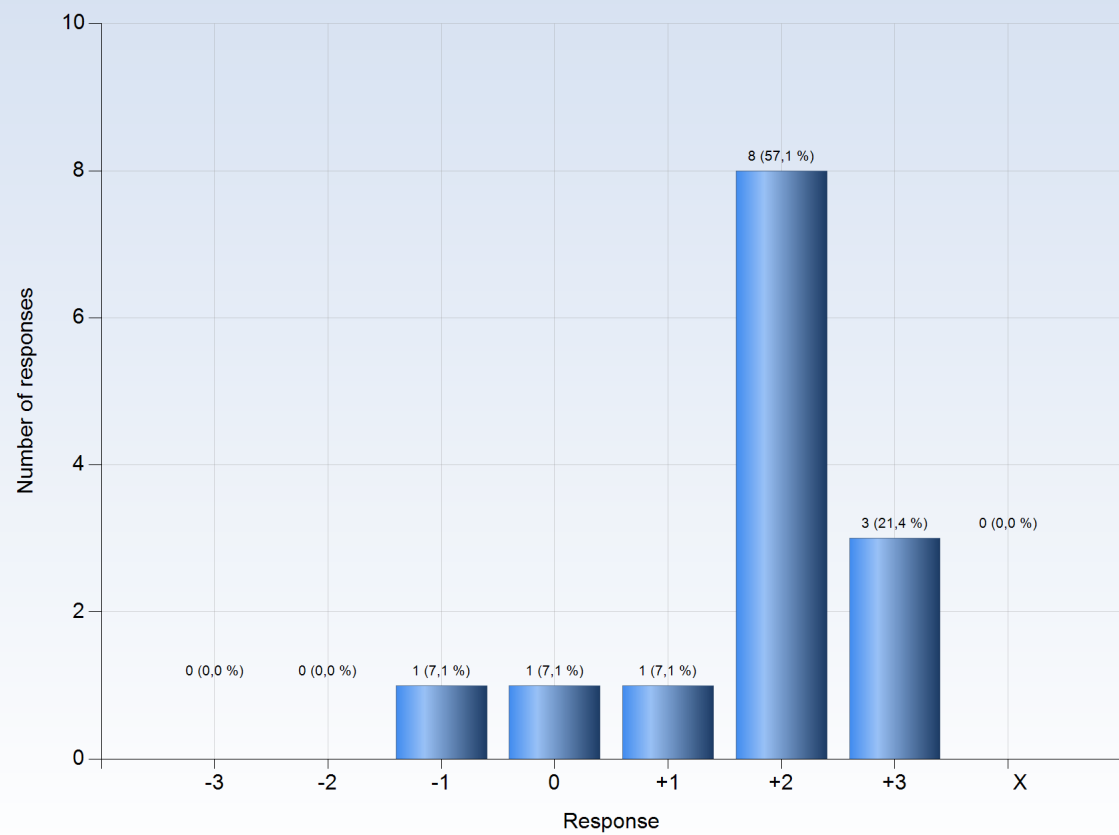
Comments

Comments (My response was: 0)

I projekten, men inte alls lika mycket under resten av kursen.

6. The atmosphere in the course was open and inclusive
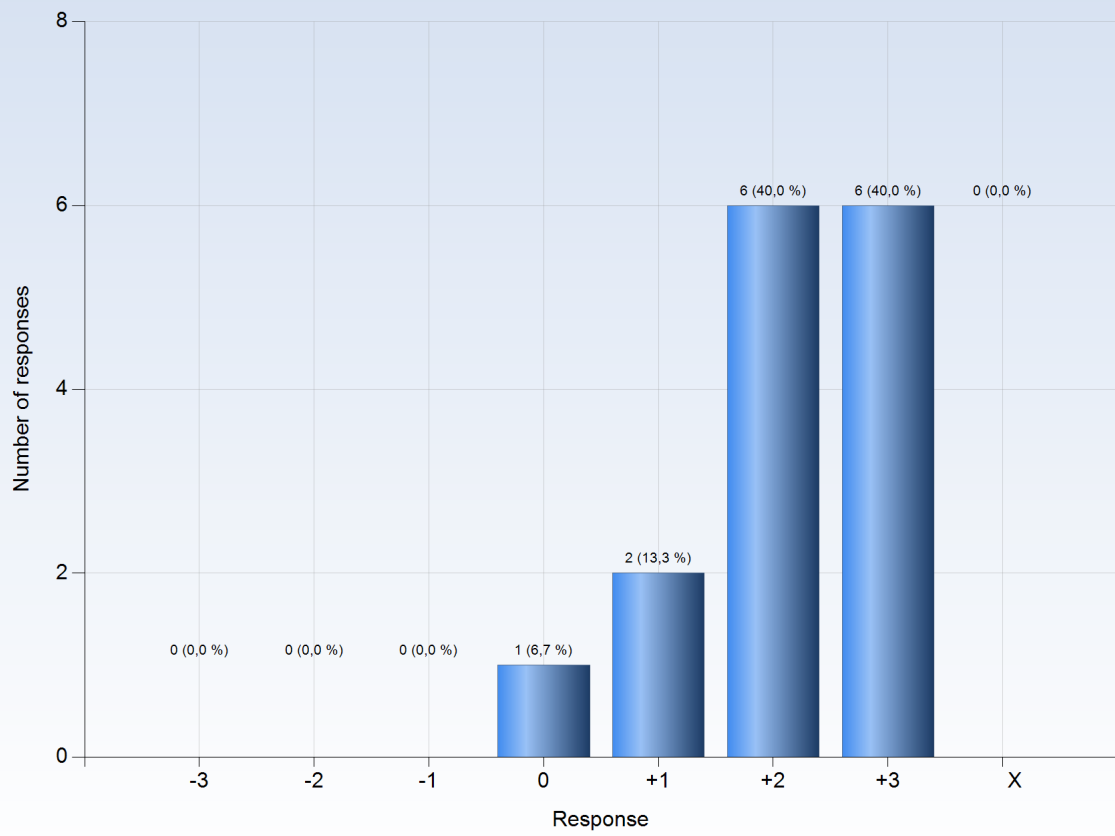
Comments

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

Number of responses

| Response | 0 (0,0 %) | 0 (0,0 %) | 0 (0,0 %) | 3 (20,0 %) | 2 (13,3 %) | 5 (33,3 %) | 5 (33,3 %) | 0 (0,0 %) |

-3   -2   -1   0   +1   +2   +3   X

Response
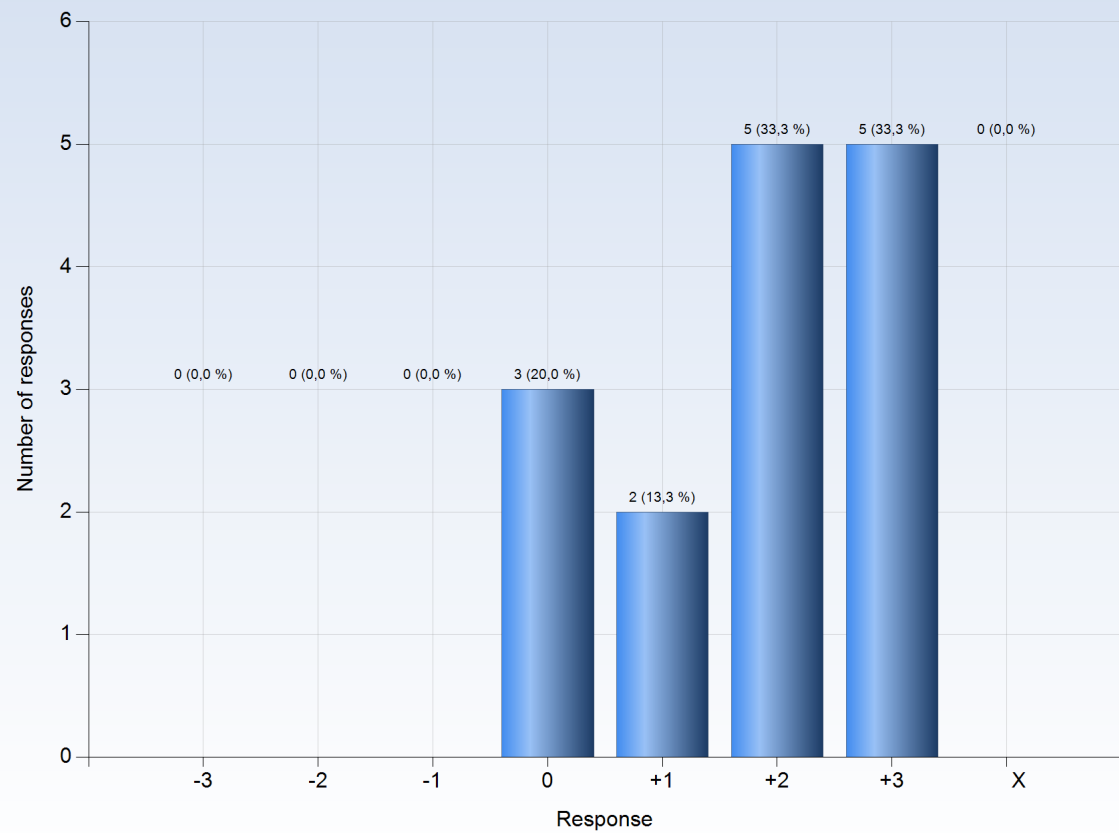
Comments

8. I understood how the course was organized and what I was expected to do
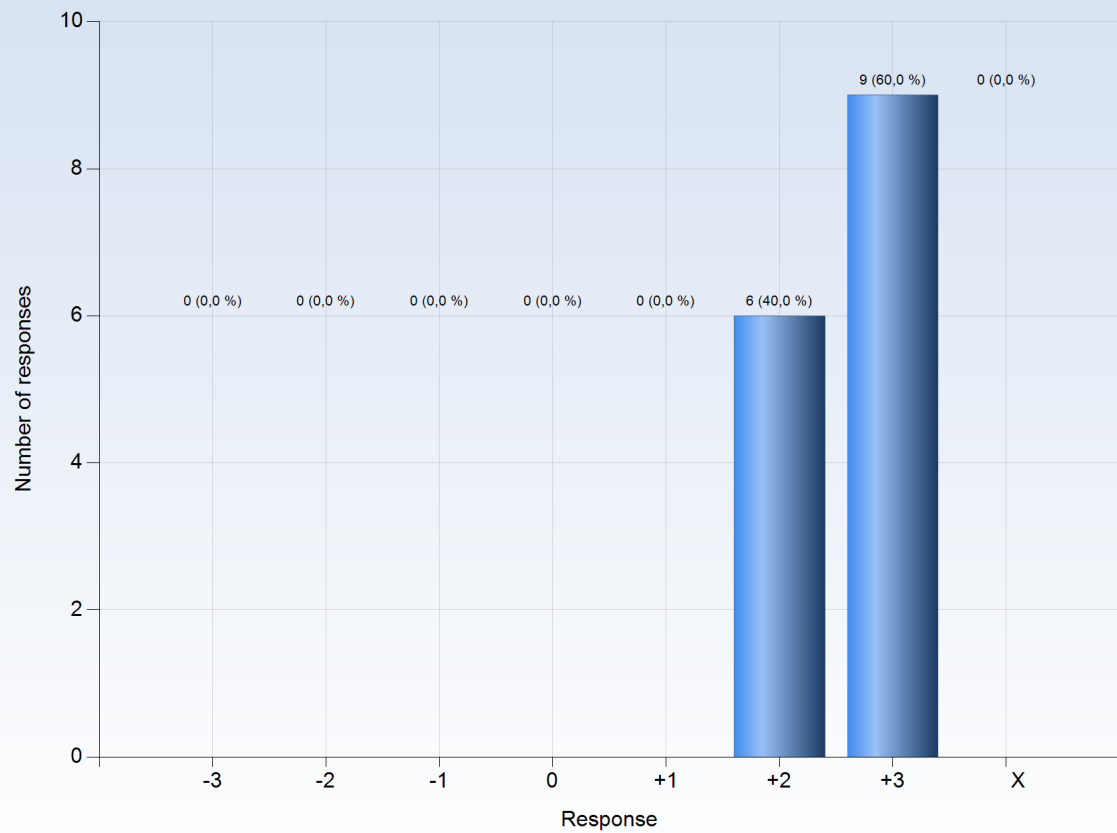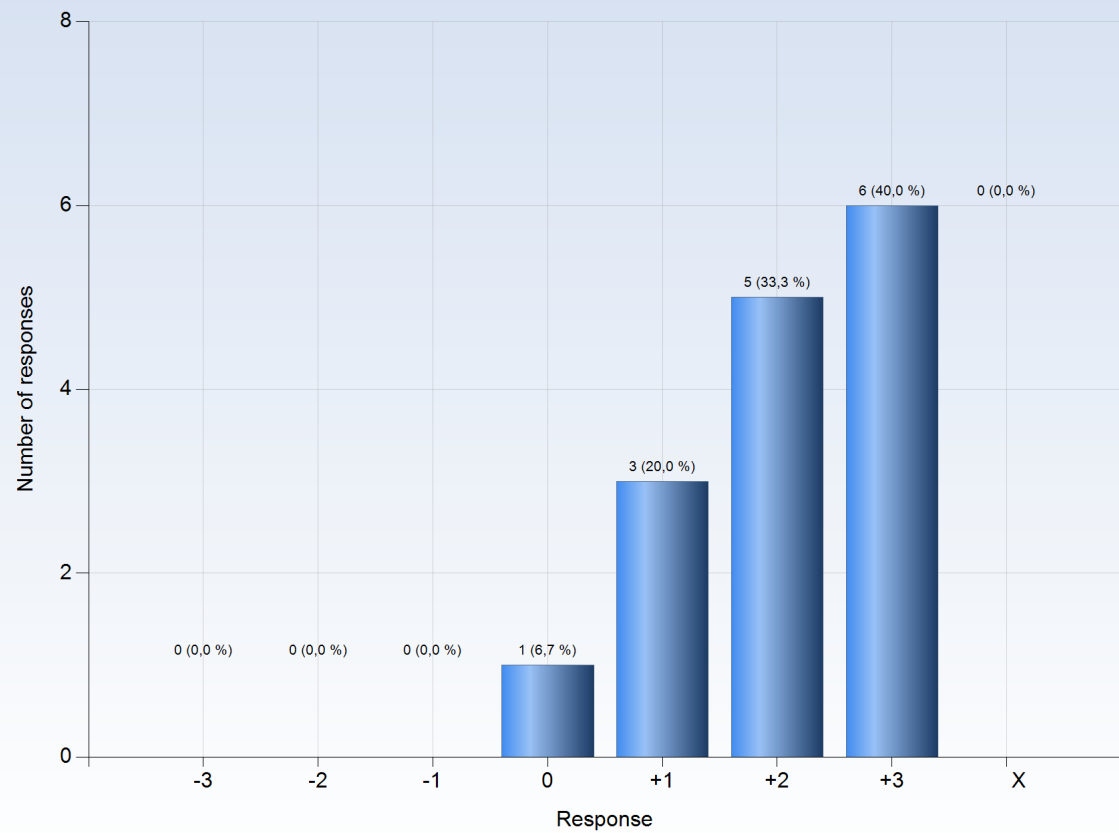

Comments

9. I understood what the teachers were talking about
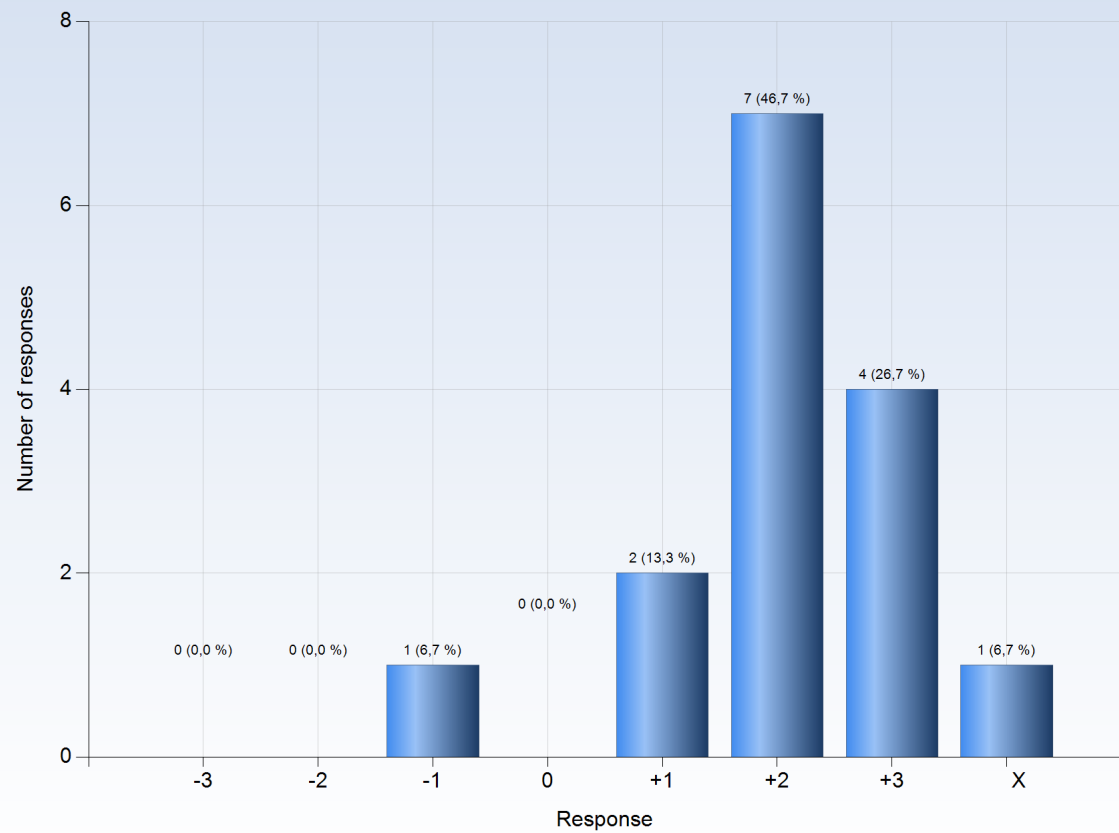
Comments

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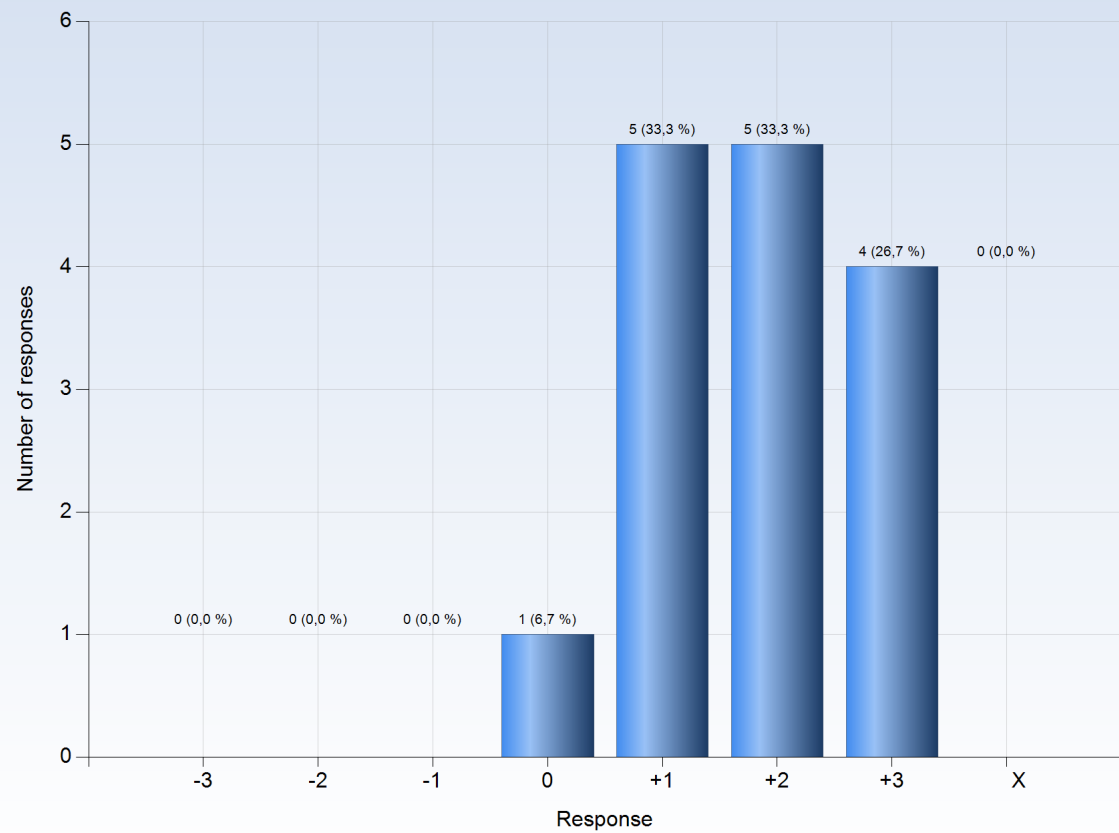
Comments

11. Understanding of key concepts was given high priority

Number of responses vs Response

- -3: 0 (0,0 %)
- -2: 0 (0,0 %)
- -1: 0 (0,0 %)
- 0: 1 (6,7 %)
- +1: 3 (20,0 %)
- +2: 5 (33,3 %)
- +3: 6 (40,0 %)
- X: 0 (0,0 %)

Comments

12. The course activities helped me to reach the learning objectives efficiently

0 (0,0 %)	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)	6 (40,0 %)	6 (40,0 %)	3 (20,0 %)	0 (0,0 %)
-3	-2	-1	0	+1	+2	+3	X

Number of responses
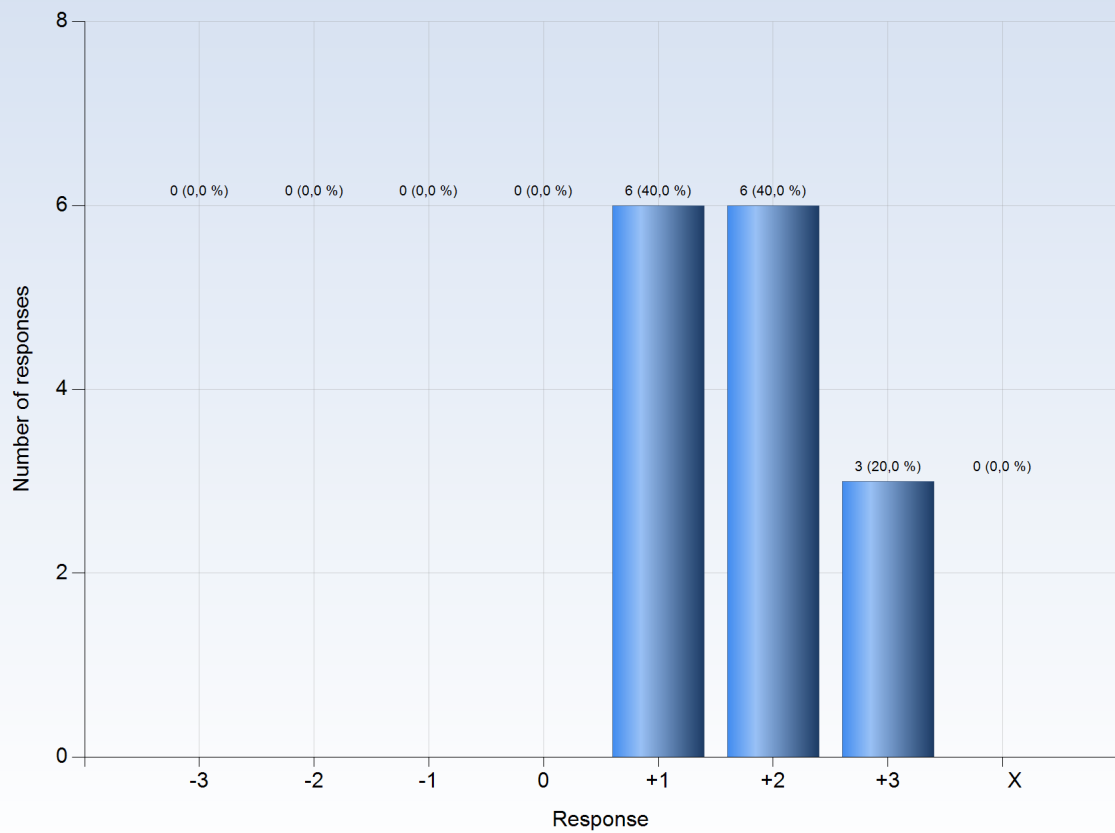
Response

Comments

(My response was: +2)

Riktigt bra övningar.

13. I understood what I was expected to learn in order to get a particular grade
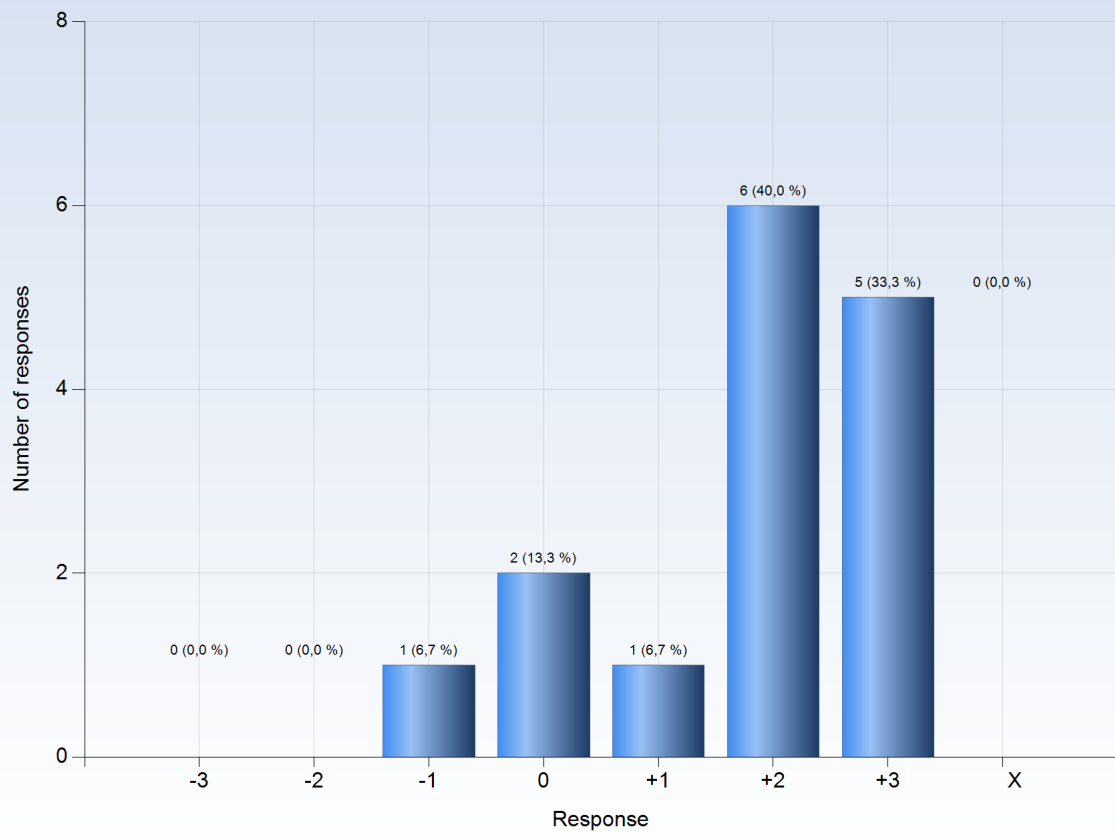
Comments

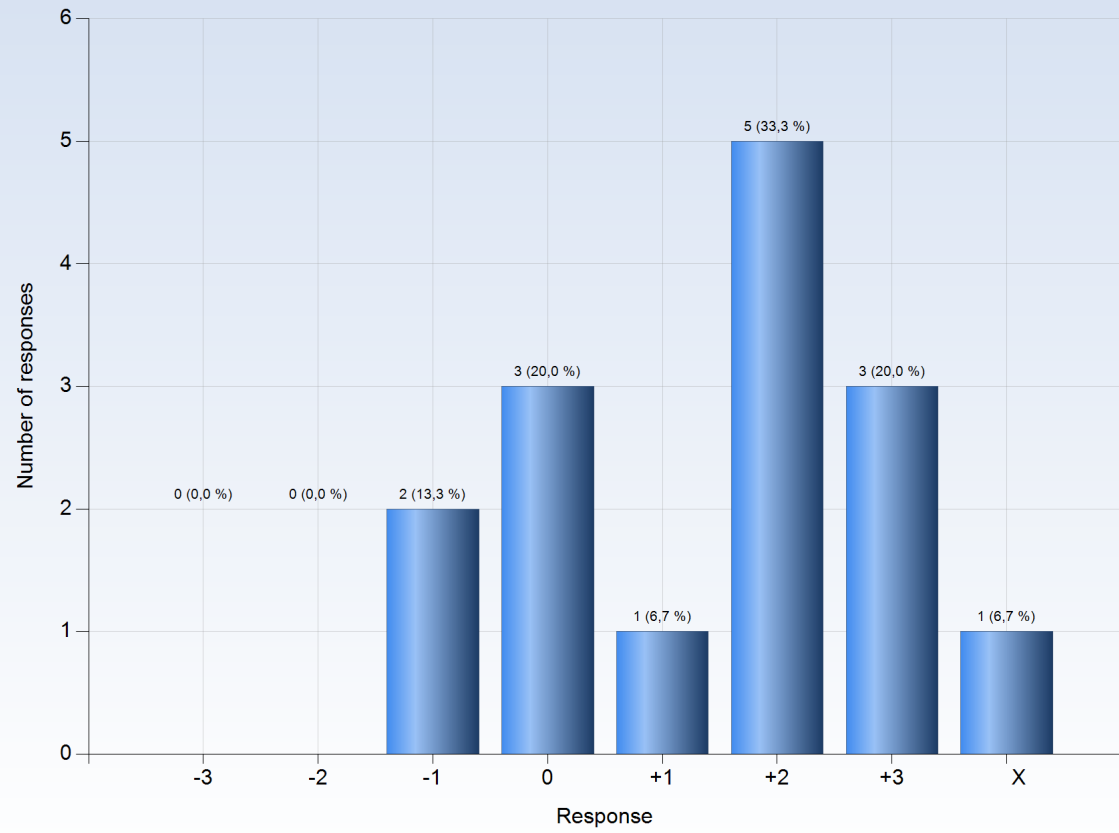## 14. I regularly received feedback that helped me see my progress
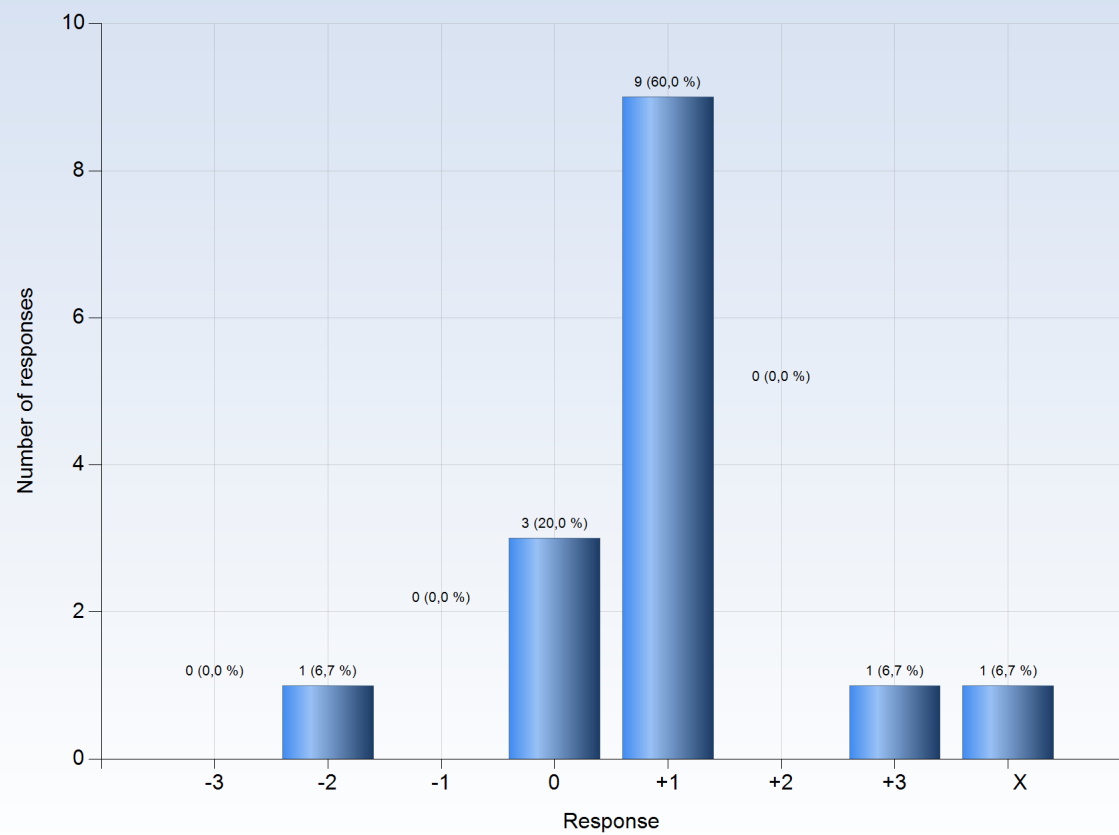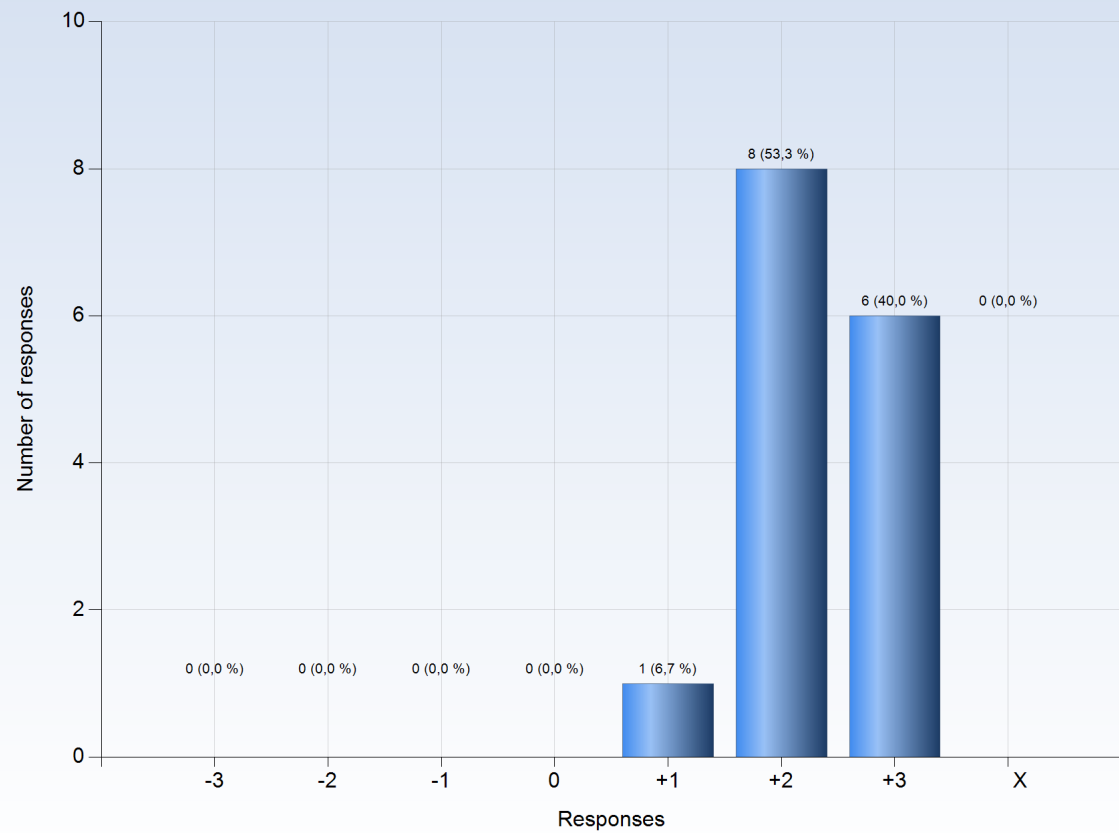
Comments

Comments (My response was: 0)
Bara utifrån projekten, den här kursen hade mått bra av en KS helt tillägnad optimeringsvillkoren.

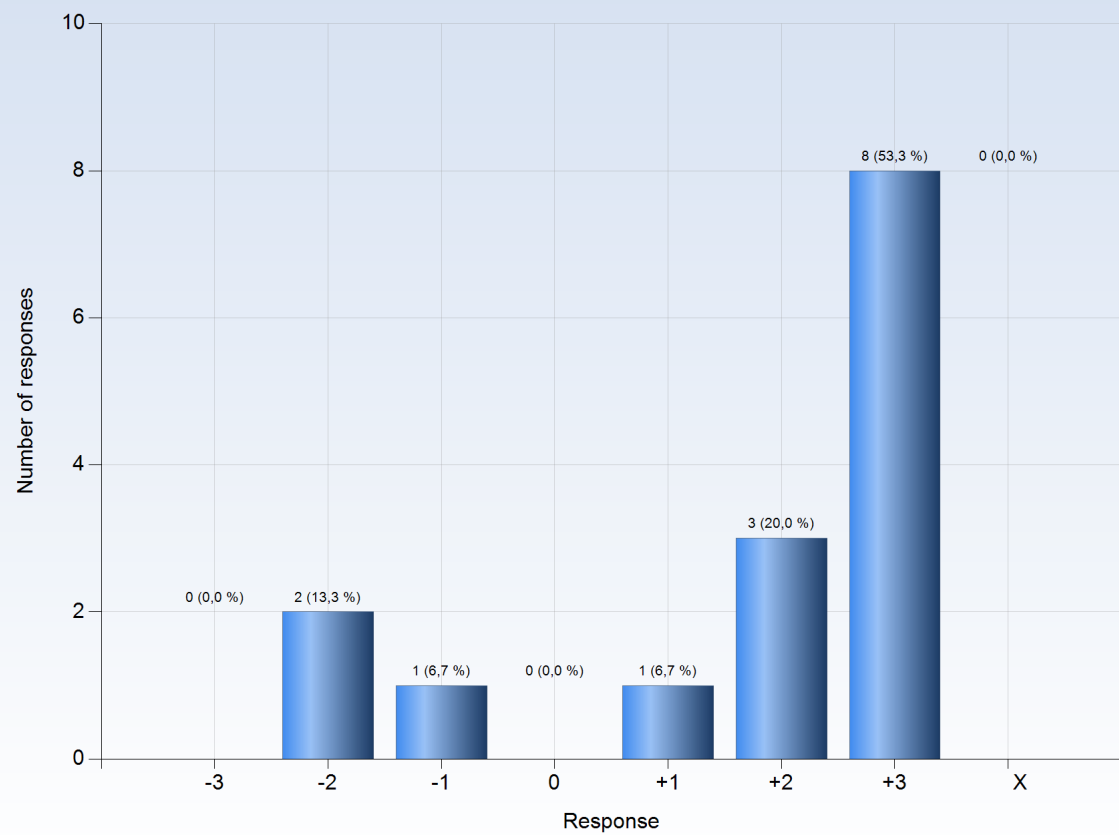## 15. I could practice and receive feedback without any grading being done

Number of responses

Response	Count
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	2 (13,3 %)
0	3 (20,0 %)
+1	1 (6,7 %)
+2	5 (33,3 %)
+3	3 (20,0 %)
X	1 (6,7 %)

Comments

16. The assessment on the course was fair and honest

Comments

17. My background knowledge was sufficient to follow the course

Number of responses

0 (0,0 %)   2 (13,3 %)   1 (6,7 %)   0 (0,0 %)   1 (6,7 %)   3 (20,0 %)   8 (53,3 %)   0 (0,0 %)
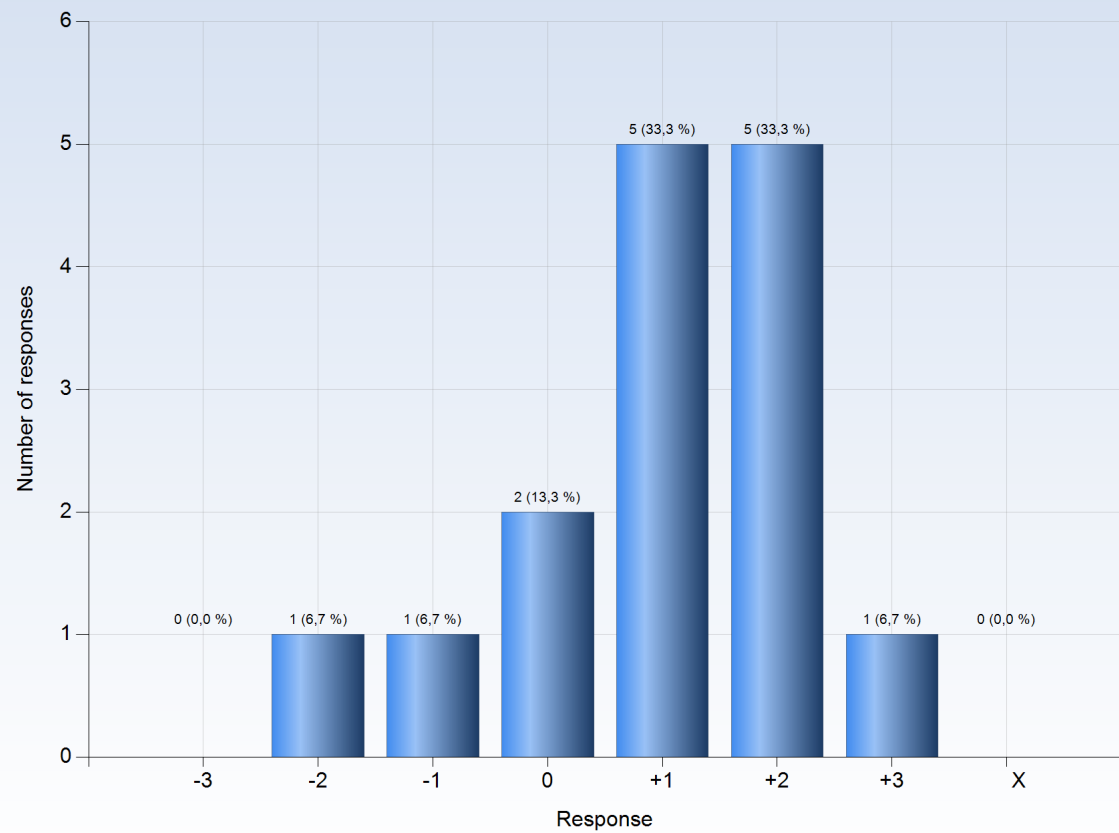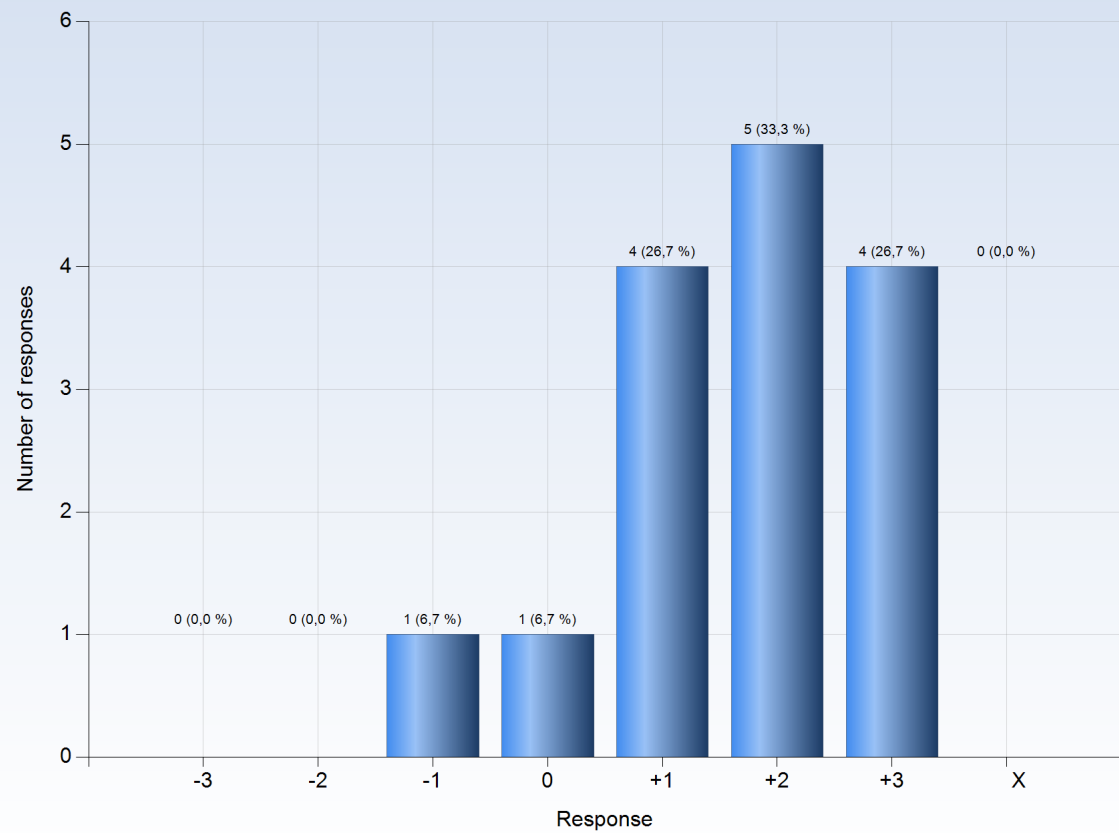
Response

-3   -2   -1   0   +1   +2   +3   X

Comments

Comments (My response was: -2)

Jag fick läsa på mycket från kursen i linjär optimering.

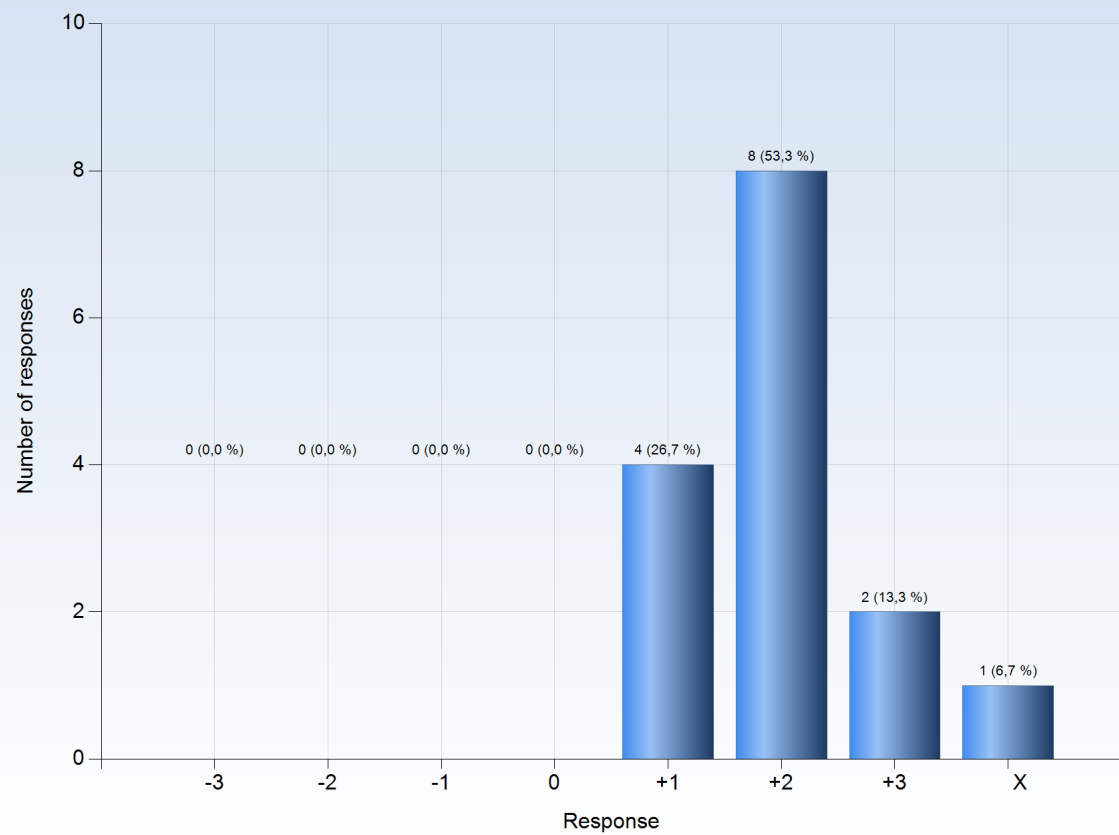**18. I regularly spent time to reflect on what I learned**

Number of responses

Response	-3	-2	-1	0	+1	+2	+3	X
	0 (0,0 %)	1 (6,7 %)	1 (6,7 %)	2 (13,3 %)	5 (33,3 %)	5 (33,3 %)	1 (6,7 %)	0 (0,0 %)

Comments

19. I could learn in a way that suited me

Number of responses

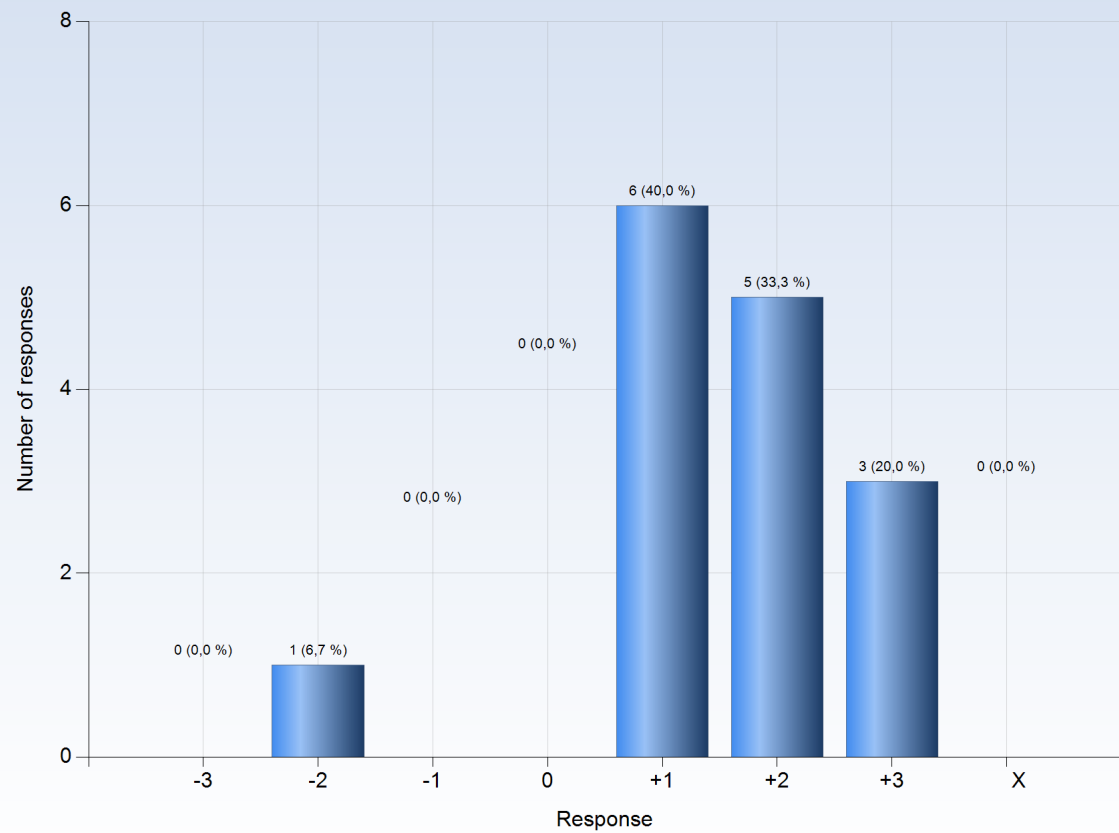| Response	
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	1 (6,7 %)
0	1 (6,7 %)
+1	4 (26,7 %)
+2	5 (33,3 %)
+3	4 (26,7 %)
X	0 (0,0 %)

Comments

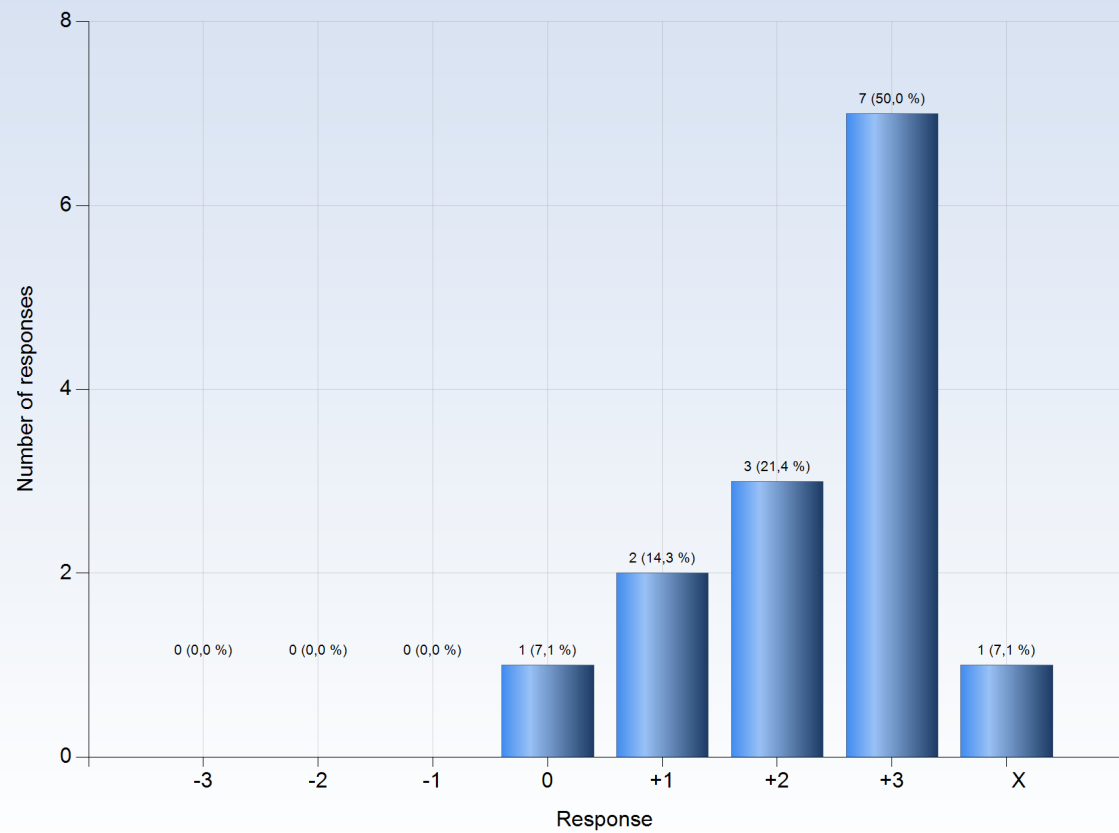**20. I had opportunities to choose what I was going to do**

Comments

21. I could learn by collaborating and discussing with others

Comments

22. I could get support if I needed it

Comments

Comments (My response was: +3)

Väldigt tydligt att man kunde komma och prata med Anders eller Axel.