Report - DD2419 - 2020-08-20

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):
Patric Jensfelt, patric@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.
We met every group (and thus every student) for a final session that consisted of both examination and ended in a discussion about the course. The students were also given an opportunity to complete a course evaluation.

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.)
The meeting after the completion of the course was the final examination and debriefing session that was help with the course responsible, TA and the group.

COURSE DESIGN
Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.
The course runs in two main phases. In the first phase the students complete individual assignments that end in an examination session. The purpose of this is to ensure that every individual has the skills and knowledge to contribute to the work in the group. We call this the "flight camp". The students are put into group from the first lecture and they are allowed to discuss the assignments in the group but every student has to solve it on their own. At the end of flight camp the students have to pass an oral examination where they present their solution to a final flight camp assignment and that they have general knowledge needed to move on to the project. Passing this part is needed before entering the second phase, which is the group project. This is where most of the time in the course is spent. All teams are given the same task to solve. To support these learning activities there are initially lectures on specific topics important for the project and then during the second half we had one seminar per week to provide information and to answer questions.Covid19 hit about half way through the course and resulted in a bit less interaction between students in the groups than desired but it worked out quite well in the end all considered.

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?
Only 9 people answers the survey and the spread is from 3-5h/week wihich is quite a bit too little to >41h which is obviously enormously too much. However, each project group make a project plan at the start of the project and allocates time to the work and then follows up on this during the course. No one in the course was logging >41h in the course so I suspect that this answer in the survey represents a peak rather than average

THE STUDENTS' RESULTS
How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?

The students did a bit better this time. The reason is most likely that we stressed more that this is difficult and that they need to give it time.

STUDENTS´ANSWERS TO OPEN QUESTIONS
What does students say in response to the open questions?

We need to be better at providing feedback to the written progress reports. We should also stress that these are actually meant more to help the students then us. It is a way to ensure that the groups meet once a week to discuss things. Experience tells me that this does not happen otherwise.

SUMMARY OF STUDENTS' OPINIONS
Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

Overall I think students are happy. There are some negative thought but most of these can be traced back to wanting more holding hands and being uncomfortable being left alone to solve problems.This is a project course where students are expected to solve their own problems and not be fed solutions. This needs rot be communicated better to the students.

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 always with the new course eval tools it is sad to see that so few answer the questionnaire to the point that you cannot really say anything from it.

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?

Will not analysis this with 9 answers

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

Set up a learning environment where the groups interact more with a TA and a lot less with the other groups.

DD2419 - 2020-06-10

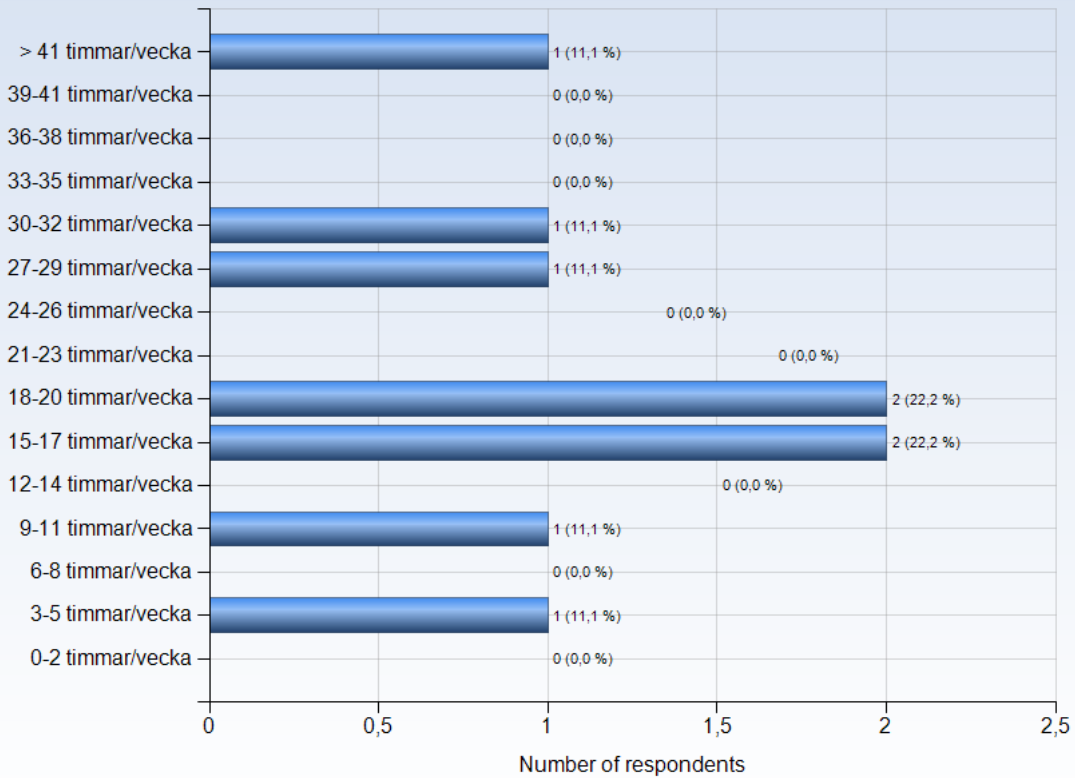Antal respondenter: 41
Antal svar: 9
Svarsfrekvens: 21,95 %

ESTIMATED WORKLOAD

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

Hours/week	Respondents
> 41 timmar/vecka	1 (11,1 %)
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	1 (11,1 %)
27-29 timmar/vecka	1 (11,1 %)
24-26 timmar/vecka	0 (0,0 %)
21-23 timmar/vecka	0 (0,0 %)
18-20 timmar/vecka	2 (22,2 %)
15-17 timmar/vecka	2 (22,2 %)
12-14 timmar/vecka	0 (0,0 %)
9-11 timmar/vecka	1 (11,1 %)
6-8 timmar/vecka	0 (0,0 %)
3-5 timmar/vecka	1 (11,1 %)
0-2 timmar/vecka	0 (0,0 %)

Number of respondents

Comments

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

Higher then expected

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

The course is time heavy. Better start ahead if you want to learn more and experiment.

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

A comparatively very large workload. In my case the amount of work was not due to inefficiency but rather a very unbalanced group where some weren't bothered to pull their weight. I would have whished for faster feedback from our weekly reports. As it were now, our TA didn't notice the unequal workload until after I was done with milestone 3 due to a large backlog of weekly reports.

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

As expected

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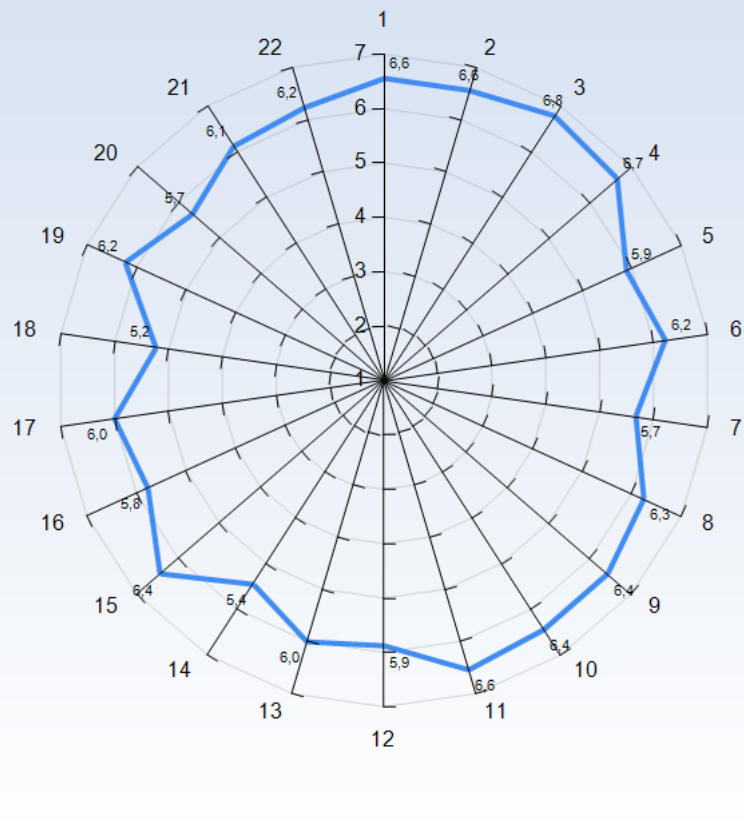
1 = No, I strongly disagree with the statement
4 = I am neutral to the statement
7 = Yes, I strongly agree with the statement

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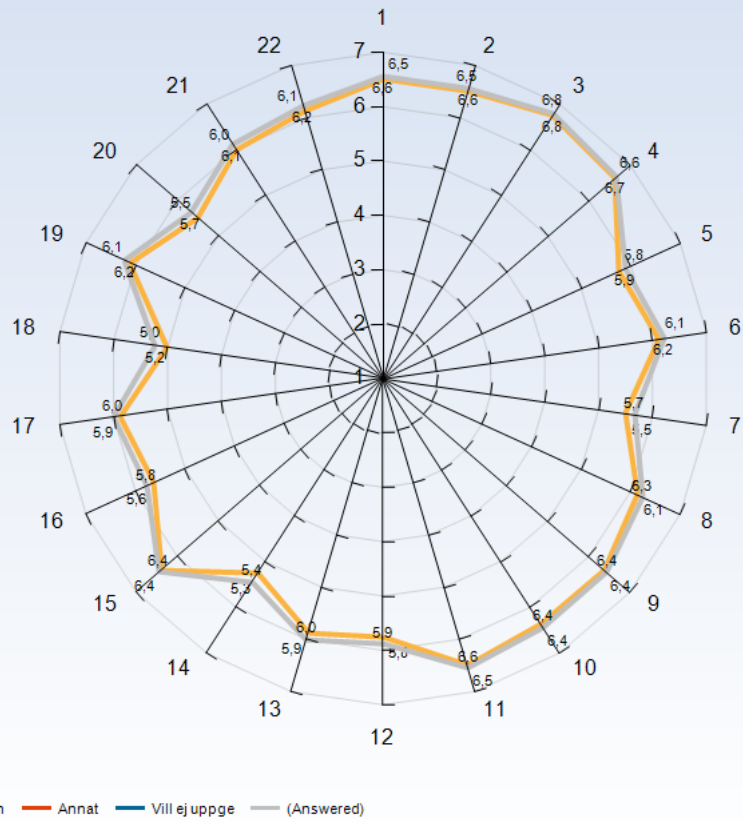
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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

Legend: Kvinna — Man — Annat — Vill ej uppge — (Answered)

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
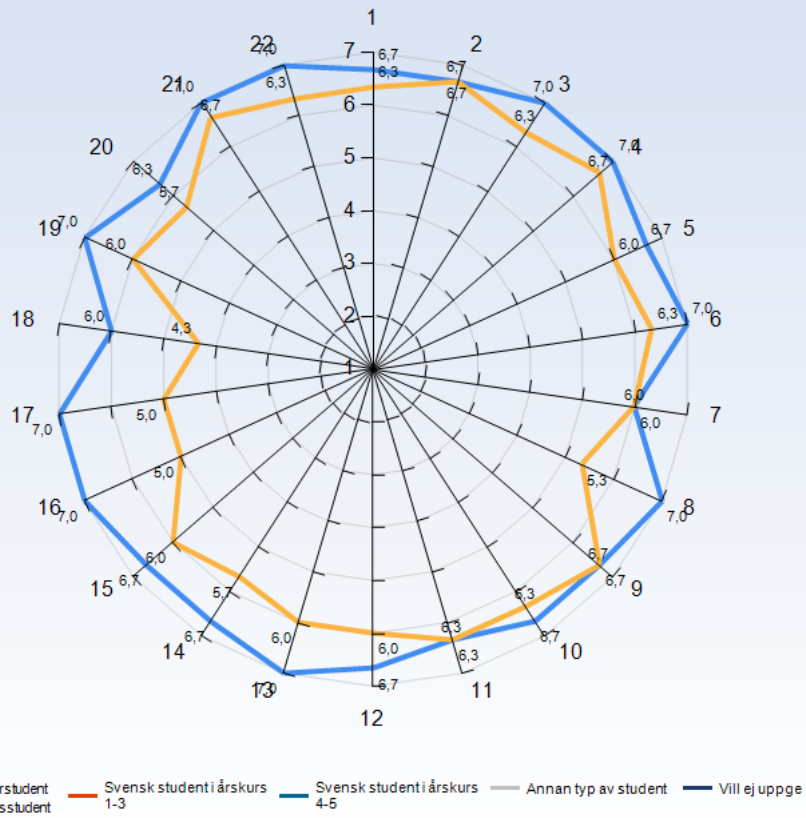
Comments

Average response to LEQ statements - per disability

Legend: Ja, Nej, Vill ej uppge
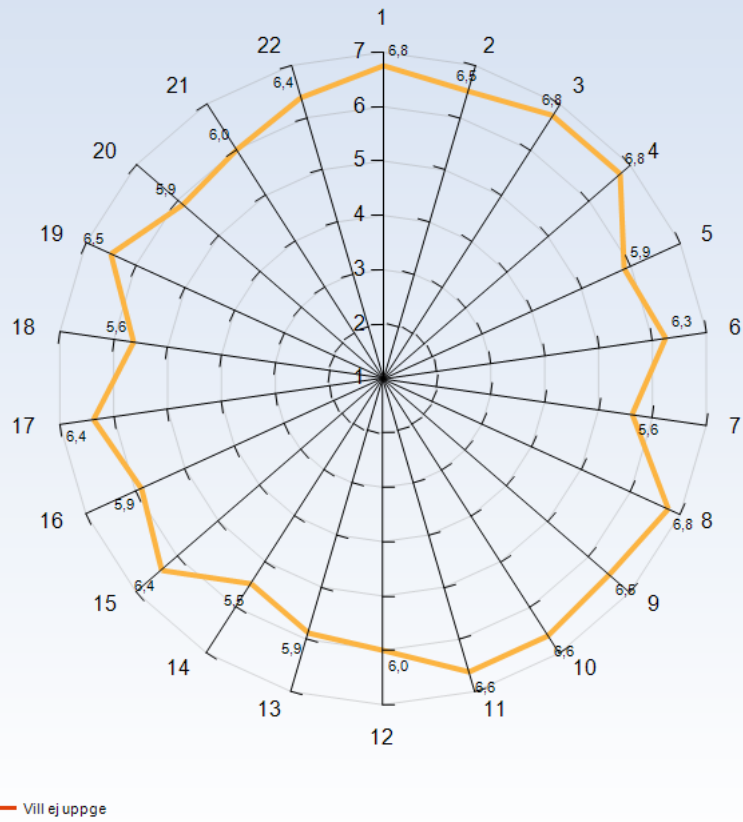
Comments

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 3-5 timmar/vecka)
Learning ROS and use it to build a fairly complex system.

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)
Solving real problems to
Understand how to use your theoretical background

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)
Its unique and practical.

What was the best aspect of the course? (I worked: 18-20 timmar/vecka)
To work with real hardware and divide the project between the team as we pleased
The fact that we can really apply our knowledge

What was the best aspect of the course? (I worked: 27-29 timmar/vecka)
The practical implementation and direct application of our knowledge.

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

What would you suggest to improve?

What would you suggest to improve? (I worked: 3-5 timmar/vecka)
More classes would improve the learning experience and the final outcome.

What would you suggest to improve? (I worked: 9-11 timmar/vecka)
Give some more time for flight camp.

What would you suggest to improve? (I worked: 15-17 timmar/vecka)
More lectures and seminars where people discuss ideas, on different parts of project and their implementation possibilities.

What would you suggest to improve? (I worked: 18-20 timmar/vecka)
An introduction assignment to learn the basics with github

What would you suggest to improve? (I worked: 27-29 timmar/vecka)
Milestones 1 and 2 felt like a roundabout way to reach milestone 3, especially the early object detection. More code from the Flight Camp was in the end used for milestone 3 compared to from the earlier milestones, from which only non-integrated short scripts were produced. More focus on project planning would have been preferable. Especially the lecture about how to organise a project should also have been much earlier than roughly half-way through the course. I tried to convince my group early on to use these methods but they weren't interested, and after the lecture our routines had already been cemented.

What would you suggest to improve? (I worked: 30-32 timmar/vecka)
I think you should suggest more strongly or mandate that we don't all just do one part. I think it should go past just understanding each part - everyone should contribute to each part.

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)
Take as much as possible from Flight Camp.

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)
Start talking with your group asap and never stop

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)
Start well ahead, there's a lot to learn and experiment. Because if you don't, you end up doing what's just asked for and not try and implement crazy ideas you've got which is more fun.

What advice would you like to give to future participants? (I worked: 18-20 timmar/vecka)
Work as a group rather than an individual, it's more fun and you learn more
Work continuously as you can! This course takes a lot of time but it is worth it

What advice would you like to give to future participants? (I worked: 30-32 timmar/vecka)
Fly on a floor with visual texture!

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: 15-17 timmar/vecka)
An access to soldering station will be great. The quality of lipo batteries is bad.

Is there anything else you would like to add? (I worked: 18-20 timmar/vecka)
During this period when we studied from home, it would have been nice to access the computer halls
By far one of the best courses I had, thanks !

Is there anything else you would like to add? (I worked: 30-32 timmar/vecka)
Great class! I will recommend to all to take next year.

SPECIFIC QUESTIONS

Feedback to the TAs in the course

Feedback to the TAs in the course
They are really helpful and reliable
Super supportive and helpful. Shout out to Daniel for stepping up at the end and helping us.
They could be more involved in groups.
The direct contact worked well during Covid-19 and the check-in early in phase 2 was useful so that we were on the right track. Something which could be improved is the reading of the weekly reports. At most I believe we had a backlog of four weeks worth of reports. The feedback we finally got was needed but in the end useless since we had already finished the project.

Do you have any suggestions for changes to allow you to explore your own ideas more in the course?

Do you have any suggestions for changes to allow you to explore your own ideas more in the course?
No
No I like the course milestones, only more focus on github in the beginning
I think the opportunity was there, but we (and seems like other groups too) lost a lot of motivation due to COVID.
A focus on project work would have enabled the division of labour in a better way. It didn't feel like a real-world project but rather a large task (a huge difference). The approach of "everybody doing and knowing everything" isn't applicable outside of school. Some sort of structure to the group is needed when people from different backgrounds who most likely don't know eachother are to work together.

Feedback on Milestones 1,2 and 3

Feedback on Milestones 1,2 and 3
Interesting experience to share ideas
It was a shame we couldn't execute milestone 3 as it was expected. Other than that I like the milestones.
Well setup
The milestones are helpful for a road map of where we should be and when we should be there.
The time window between Milestone 2-3 is large. Couple of seminars in between can be planned to demonstrate the progress.
Milestones 1 and 2 were of little use for milestone 3 and need to be reworked to be less strict and have more of a focus on the system as a whole. As they were now they were more of seperate tasks. Milestone 3 was fun but the instructions were a bit confusing since obsolete aspects from last year's course could be found throughout our material.

Feedback on the flight camp in general

Feedback on the flight camp in general
It is a good recap about ROS and it is strongly needed
Good way to start the project
Flight camp was fun.
Aruco detection task could be explained in more detail.
Good introduction to ROS, maybe not easy enough for someone who never saw it
The installation process needs to be updated since there were errors in the instruction which I had to spend unnecessay time on. For example 'echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc source ~/.bashrc' which turned out should be on two seperate lines.

Feedback on the flight camp as a way to prepare for the work in the project

Feedback on the flight camp as a way to prepare for the work in the project
It is enough
It was good that the whole team had to pass individually
This was very good
It was helpful.
If the goal is not to use the color segmentation, I don't see a point of having it there.
A good introduction to ROS. More examples would have been appreciated, especially relating to TF transforms.

Comments about the feedback and guidance you got in the course

Comments about the feedback and guidance you got in the course
Always really clear
When we really got stuck and needed help we got it from our TA
No comments.
The feedback on what was handed in in written form was always late (up to four weeks from when we submitted it) and the weekly reports felt like a waste of time when the feedback clearly showed that the reports were only skimmed through.

Comments on working from a distance in the second half of the project

Comments on working from a distance in the second half of the project
Not interesting as the course was intended to be but well organized. It worked
Zoom and visual studio online have worked perfect for us, but it would have been better if we could have accessed a larger area to practice for milestone 3
Not too hard
Our group lost a lot of motivation. Only one of us had the drone and did all the testing. I think you did the nest you could to set us up for success under the circumstances.
Hunting for a place to fly drone and test was a really difficult.
It was challenging and it slowed us down on our work pace. it was also very difficult to do tests on the drone
The group work didn't work at all since some stopped working tried to push over their tasks onto others. A nightmare.

Changes we can make too the course to make you rely less on the simulator and work more on the actual drone

Changes we can make too the course to make you rely less on the simulator and work more on the actual drone
Start telling not to rely on the simulator from day1.
I don't know. I like how we always checked simulation before the drone when we changed something.
have designated lab space for the drone testing
I think it should be possible to add some uncertainty to the position of the drone in the simulation (but then this would have the opposite effect because we could develop and test localization in simulation environment).
Reduce technical failures leading to breakdown of the drone. Small example- The battery wire on the drone can be ziptied to the drone frame to reduce stress on solder joint.
Rework milestones 1 and 2 to give the project a more holistic approach. Without a working framework (which you don't have until before milestone 3) you have to use the simulation in order to test the isolated task you are working on.
Separate the camera and the drone to begin with so that two seperate halves of the group can work with the hardware from the getgo.

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
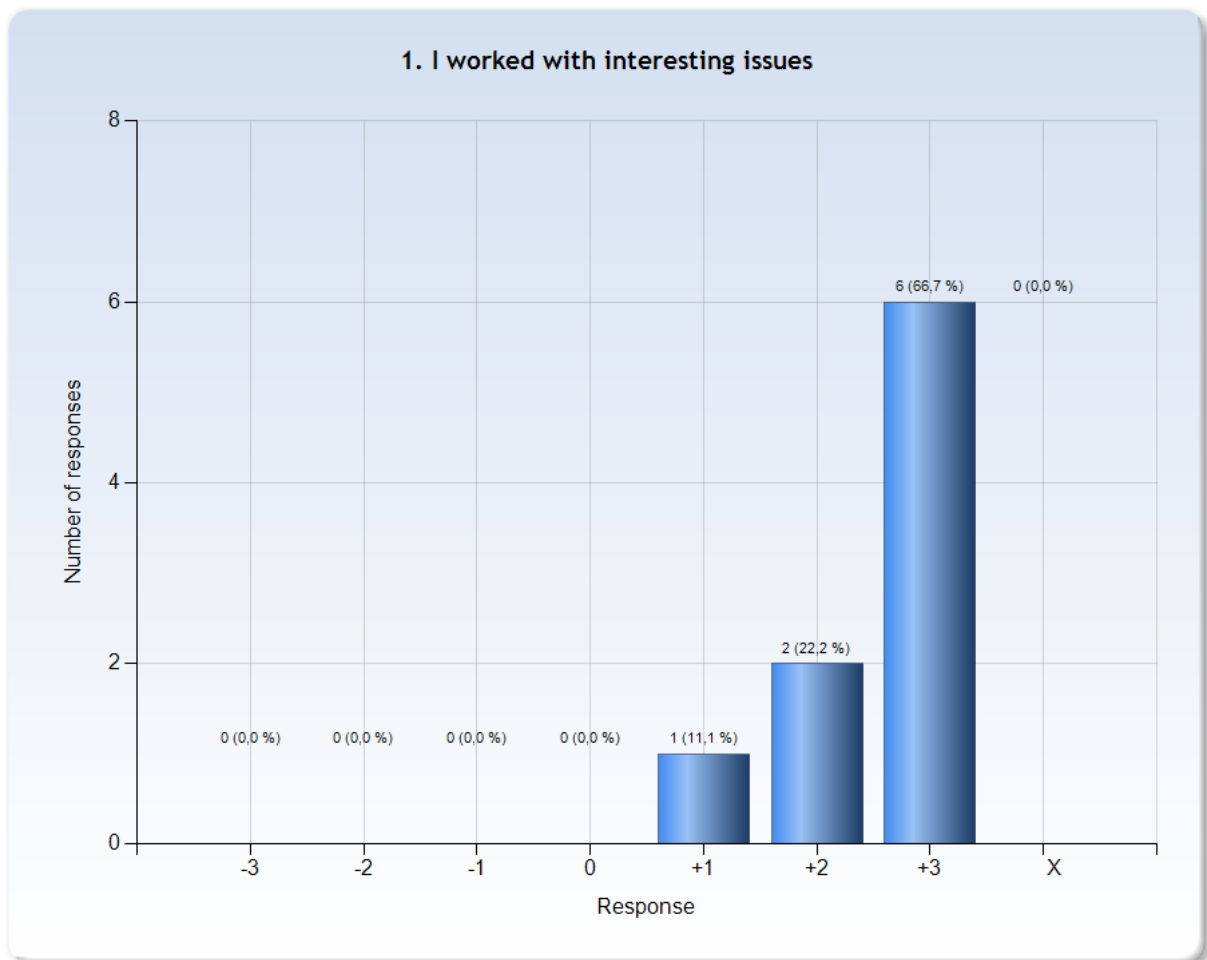
Comments

2. I explored parts of the subject on my own

Number of responses

0 (0,0 %) 0 (0,0 %) 0 (0,0 %) 0 (0,0 %) 1 (11,1 %) 2 (22,2 %) 6 (66,7 %) 0 (0,0 %)

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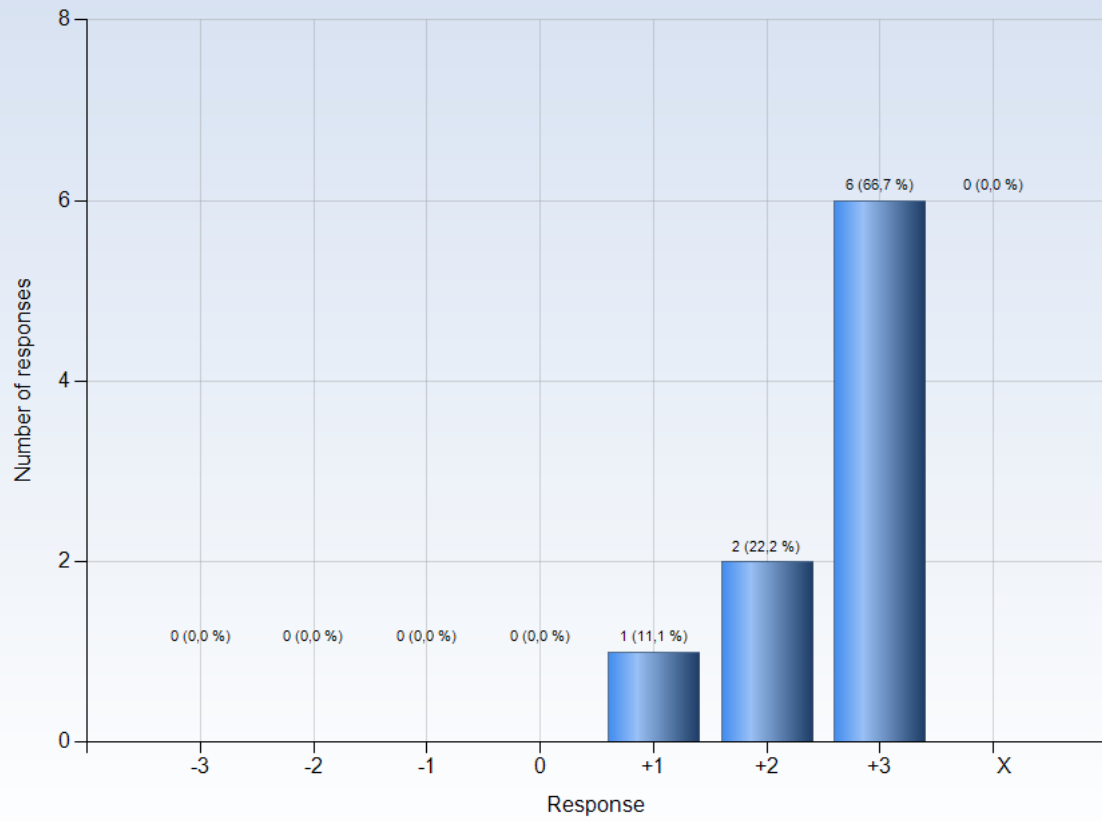
Response

Comments

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

Number of responses

Response	
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	0 (0,0 %)
0	0 (0,0 %)
+1	1 (11,1 %)
+2	0 (0,0 %)
+3	8 (88,9 %)
X	0 (0,0 %)
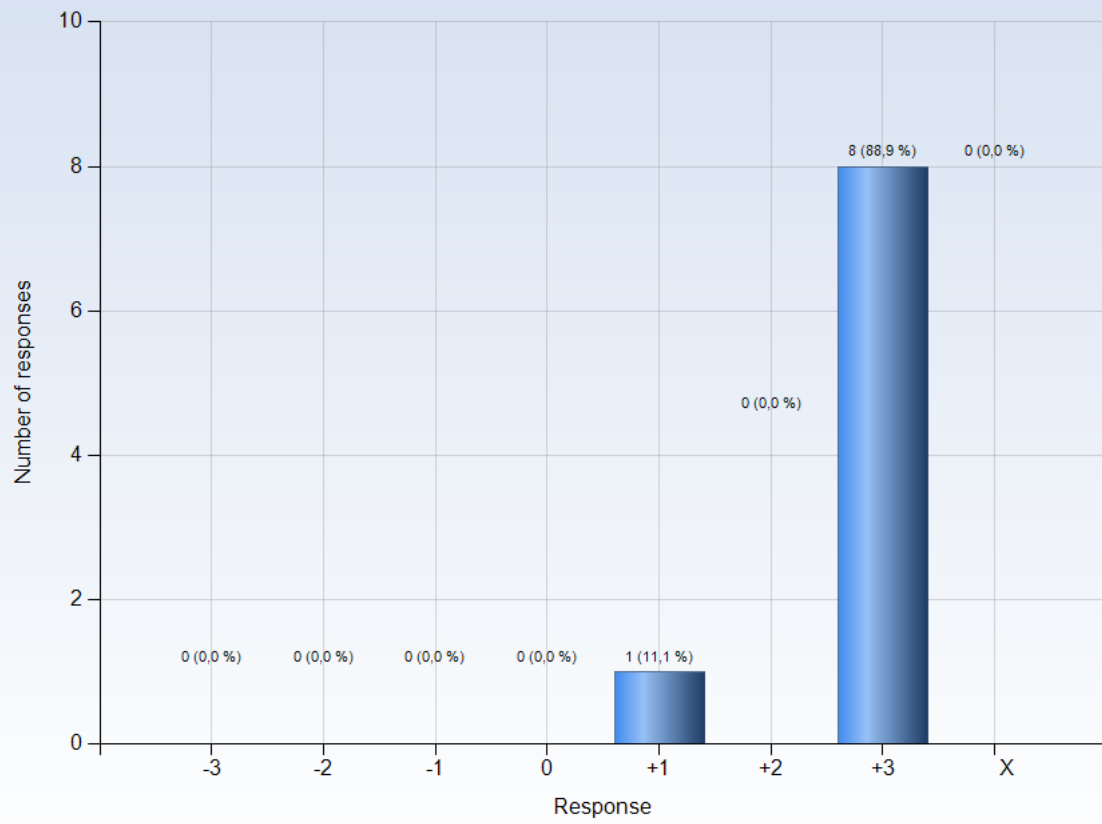
Comments

4. The course was challenging in a stimulating way
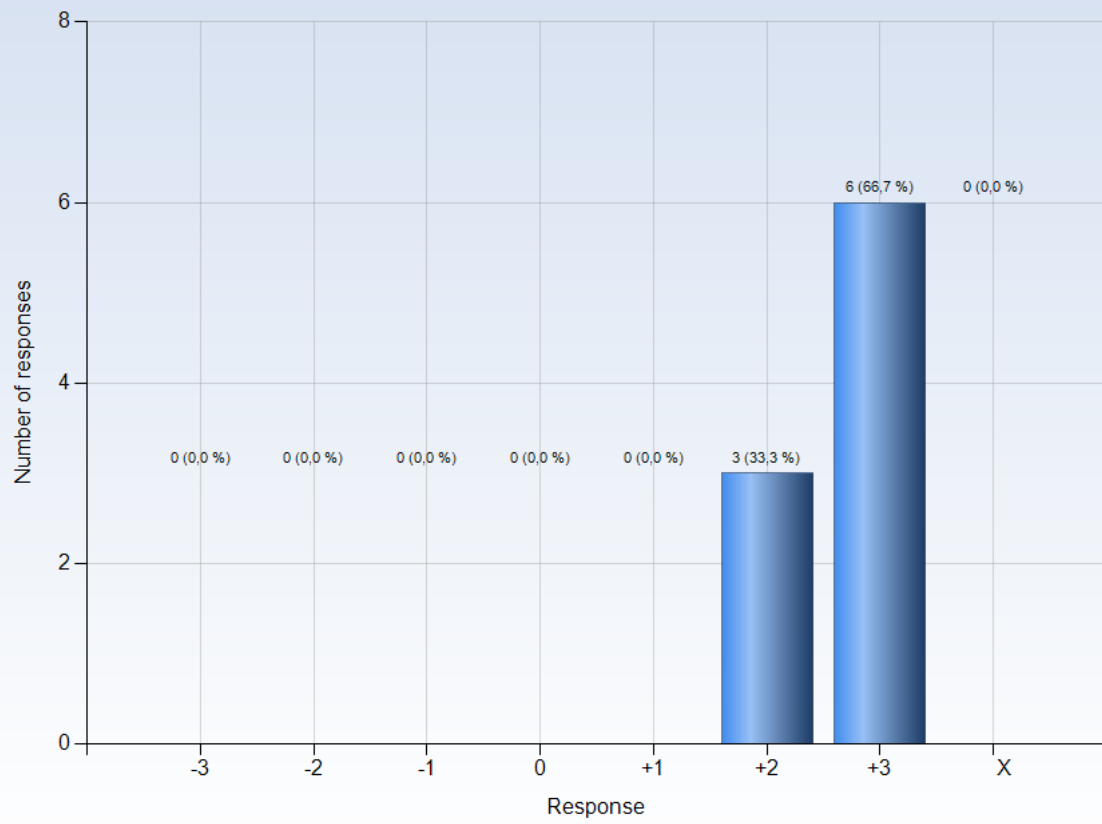
Comments

5. I felt togetherness with others on the course
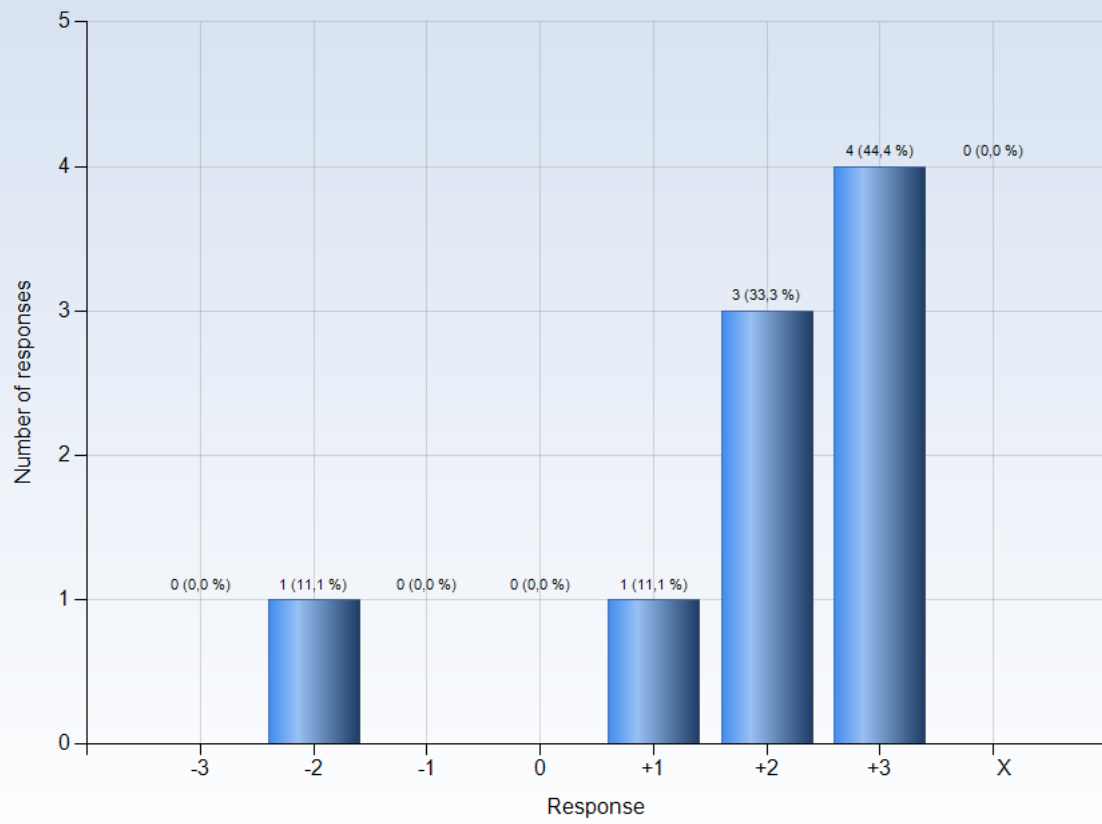
Comments

Comments (My response was: -2)

Our dysfunctional group made the group work a pain.

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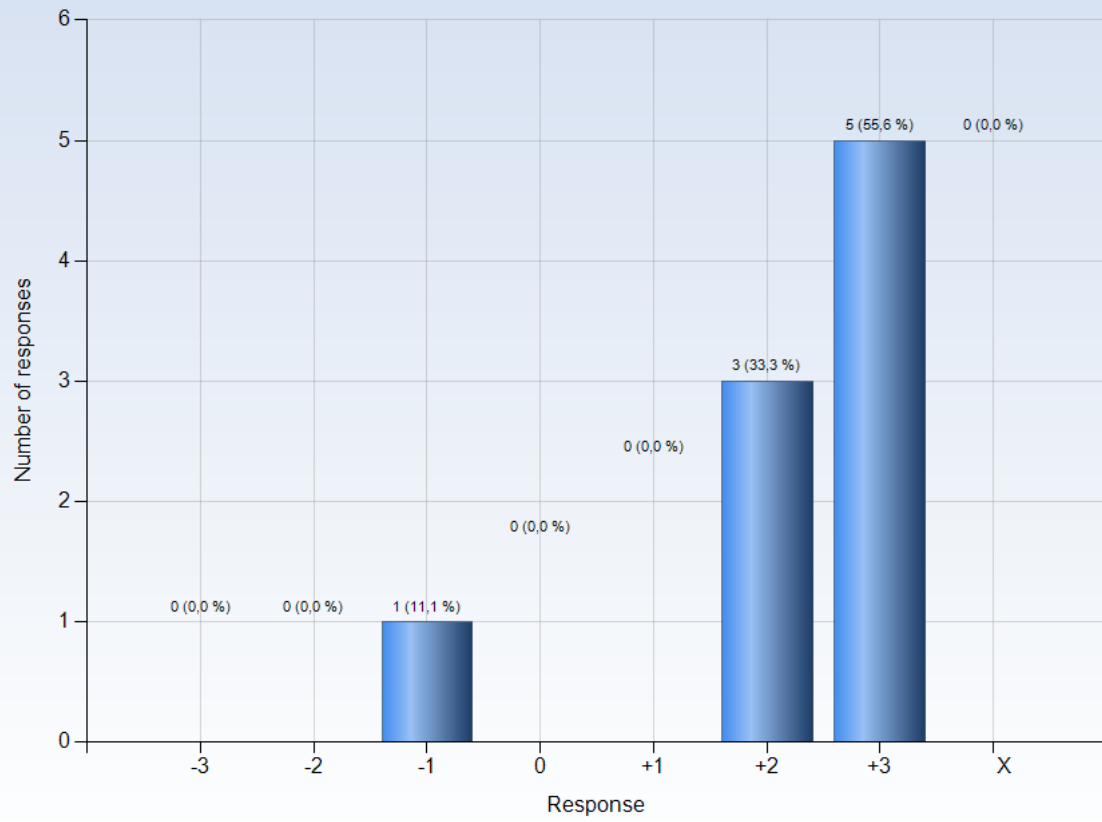
Comments

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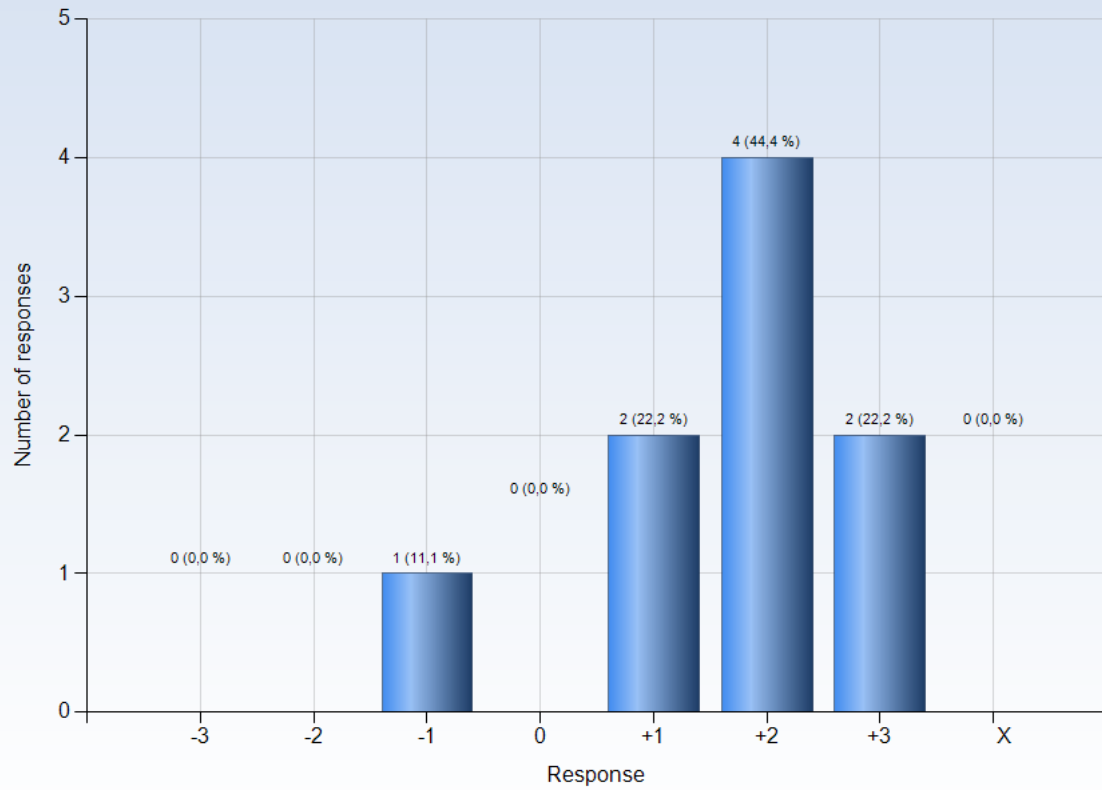
Comments

Comments (My response was: -1)

Less duw to the learning outcomes and more due to it being a project course where theses goals are fuzzy.

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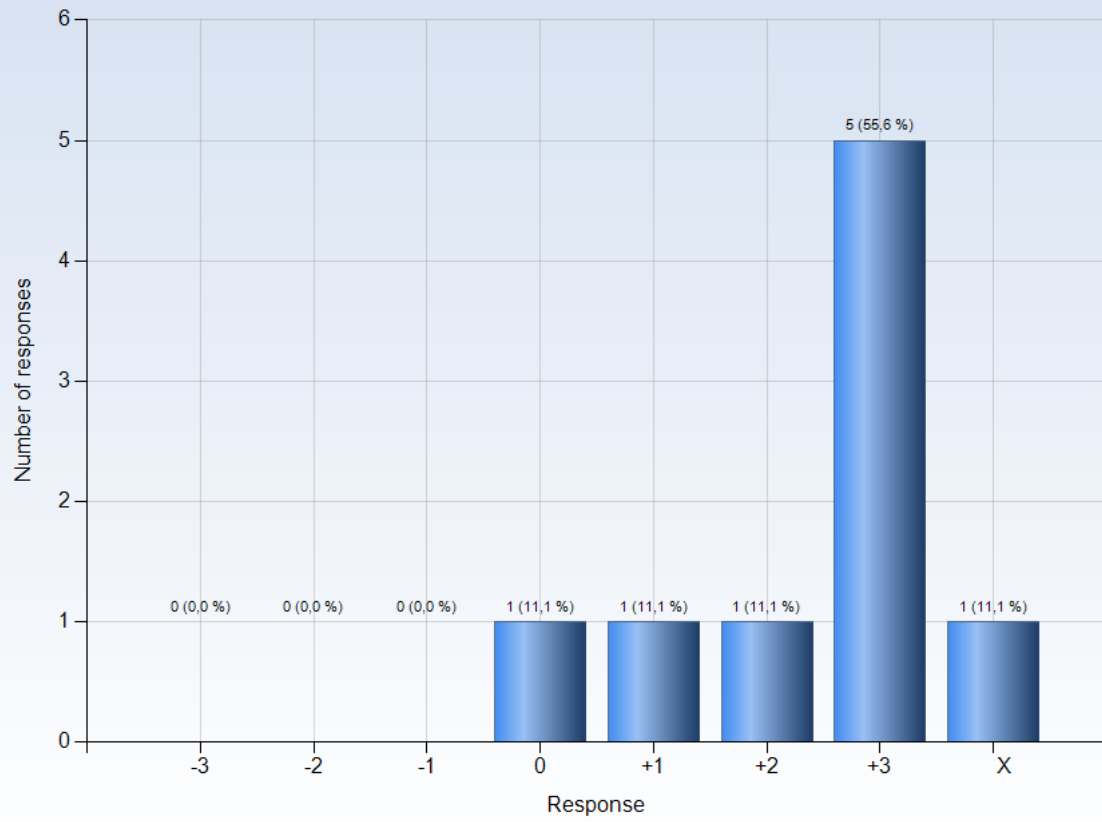
Comments

9. I understood what the teachers were talking about

Number of responses

Response	Count
-3	0 (0,0 %)
-2	0 (0,0 %)
-1	0 (0,0 %)
0	0 (0,0 %)
+1	1 (11,1 %)
+2	3 (33,3 %)
+3	5 (55,6 %)
X	0 (0,0 %)
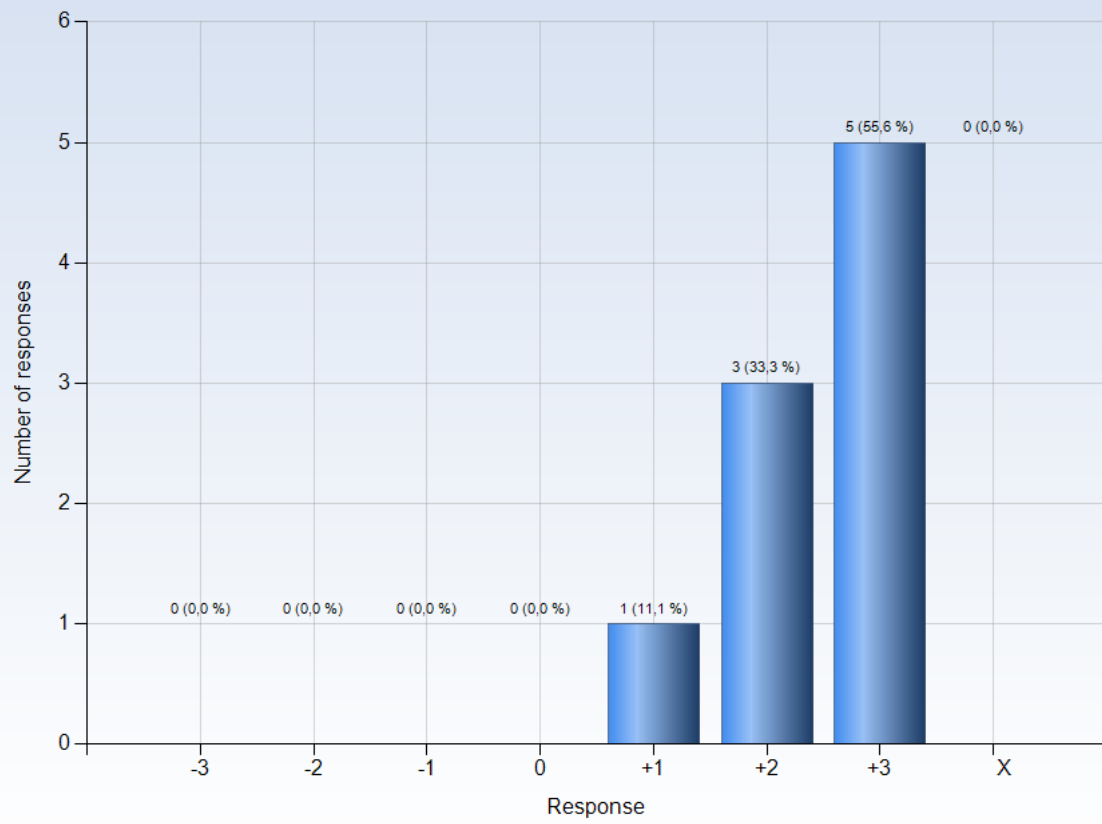
Comments

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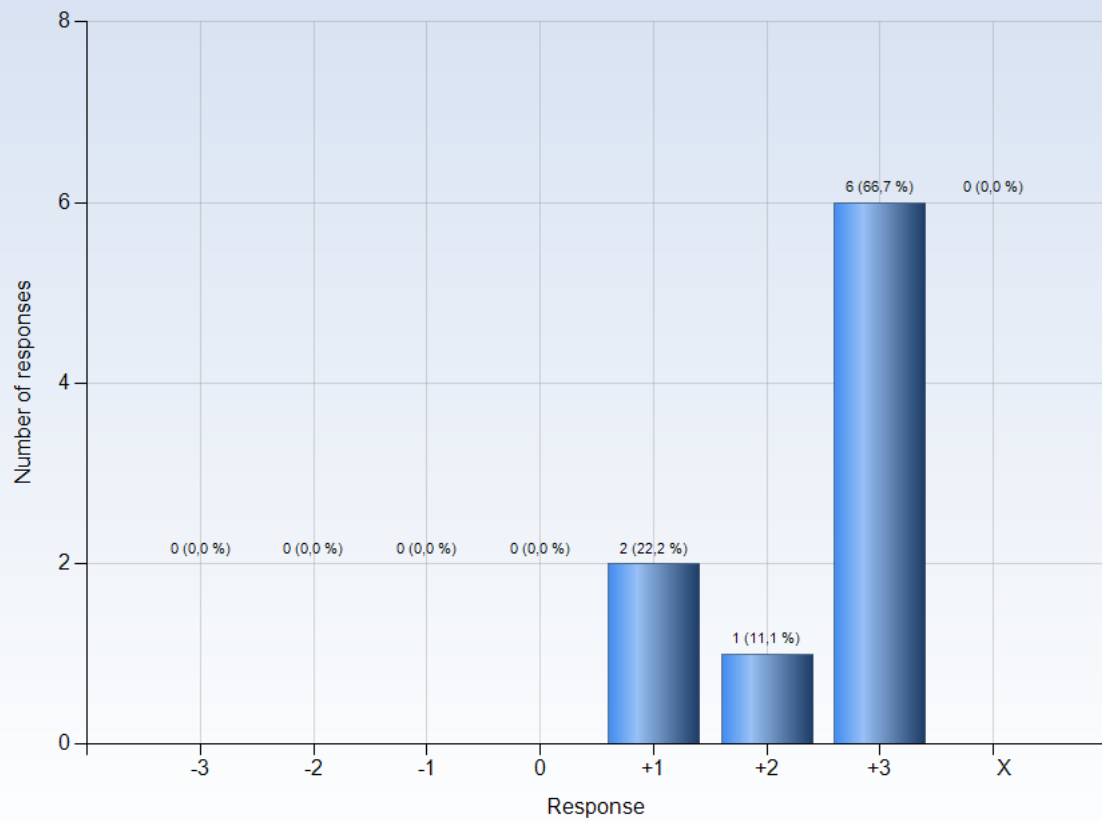
Comments

Comments (My response was: +3)

The direct practical implementation was key.

11. Understanding of key concepts had high priority
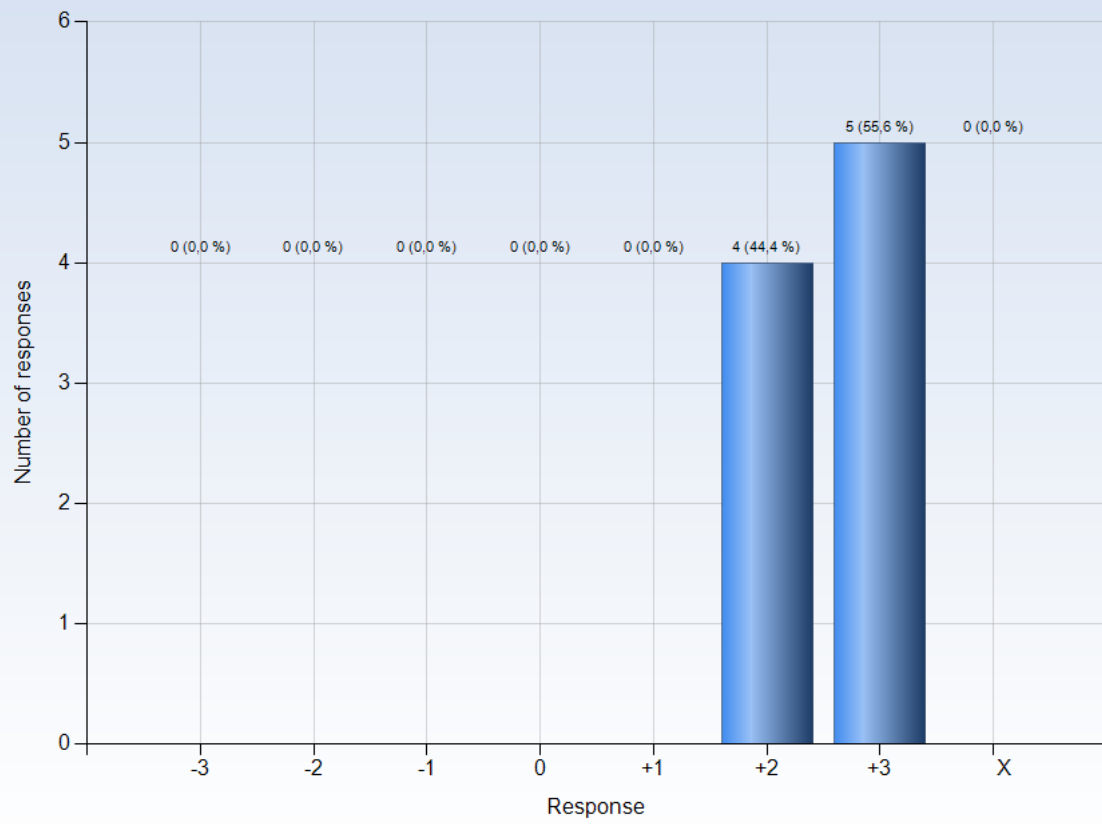
Comments

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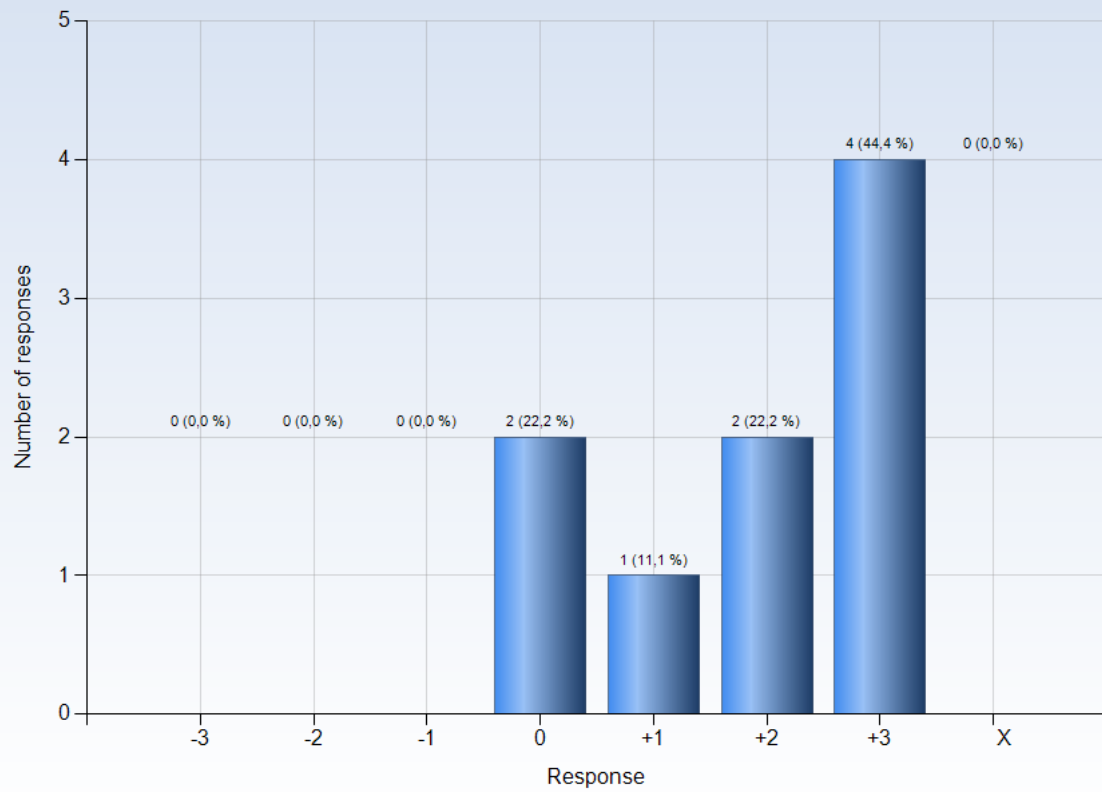
Comments

(My response was: 0)

Milestones 1 and 2 were in my opinion too loosly connected to milestone 3. More focus on project planning and project methods would have been more efficient.

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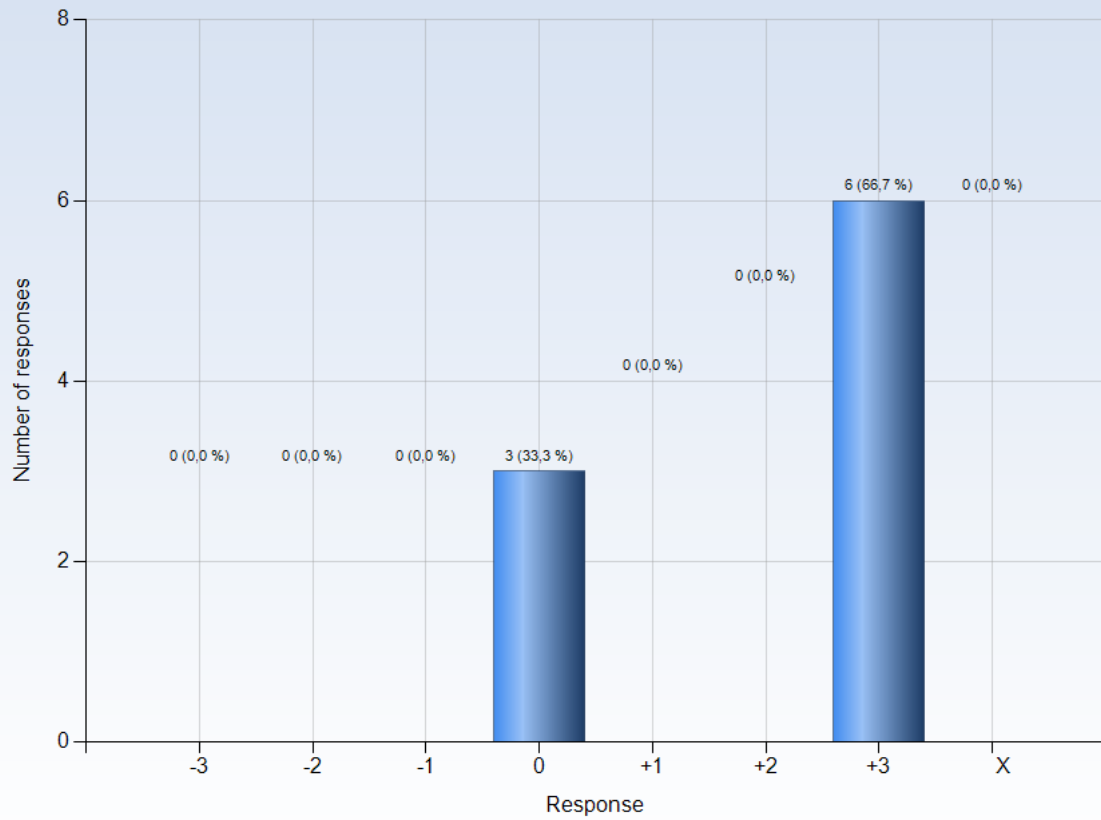
Comments

Comments (My response was: 0)

Covid-19 was an obstacle, but it was clear that I had interpreted the minimum requirements to include more than what most goups showed during the presentation and therefore put in more work than was perhaps necessary.

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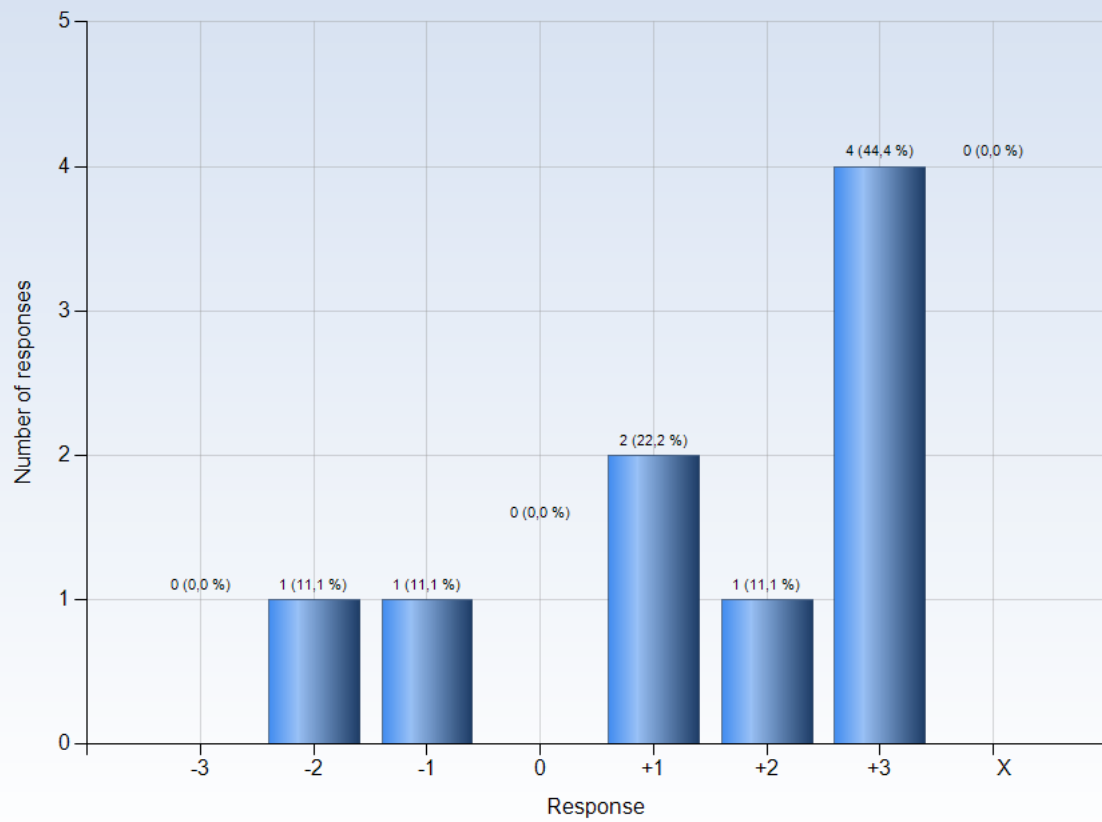
Comments

Comments (My response was: -2)

The direct contact with TA and Patric worked well, but the feedback on what was handed in during the course was lacking and/or late.

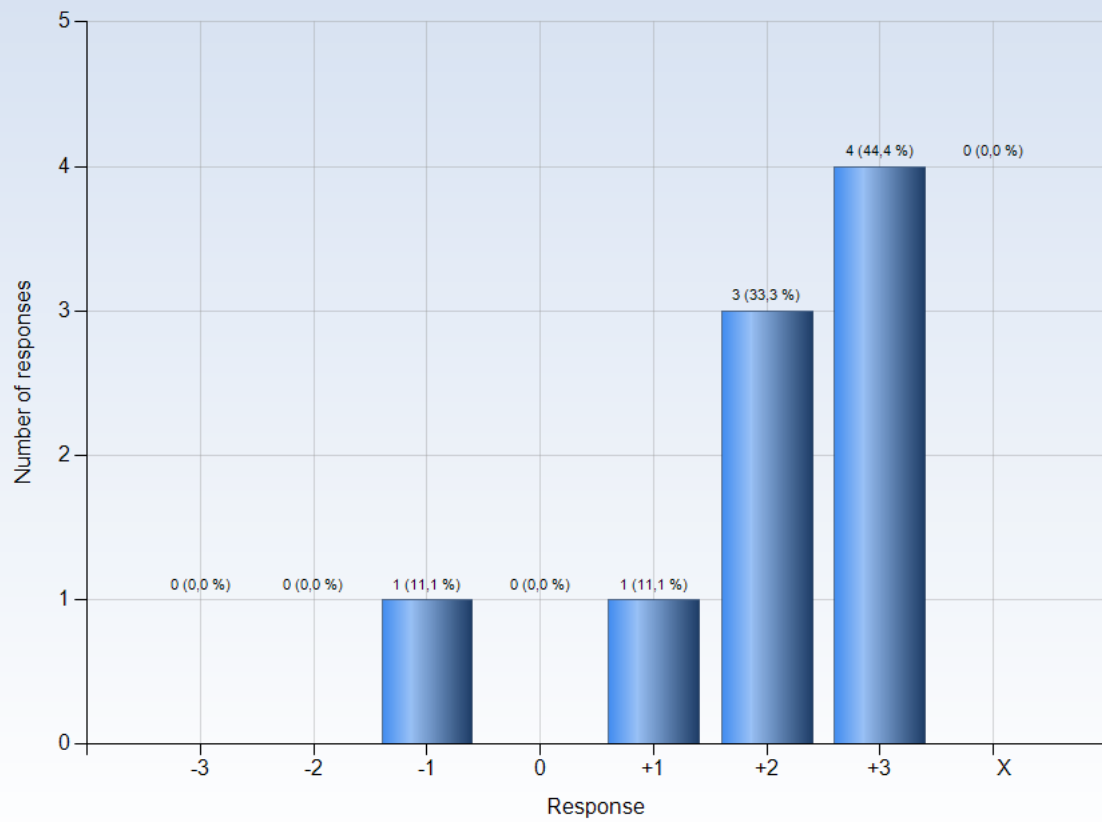**15. I could practice and receive feedback without being graded**
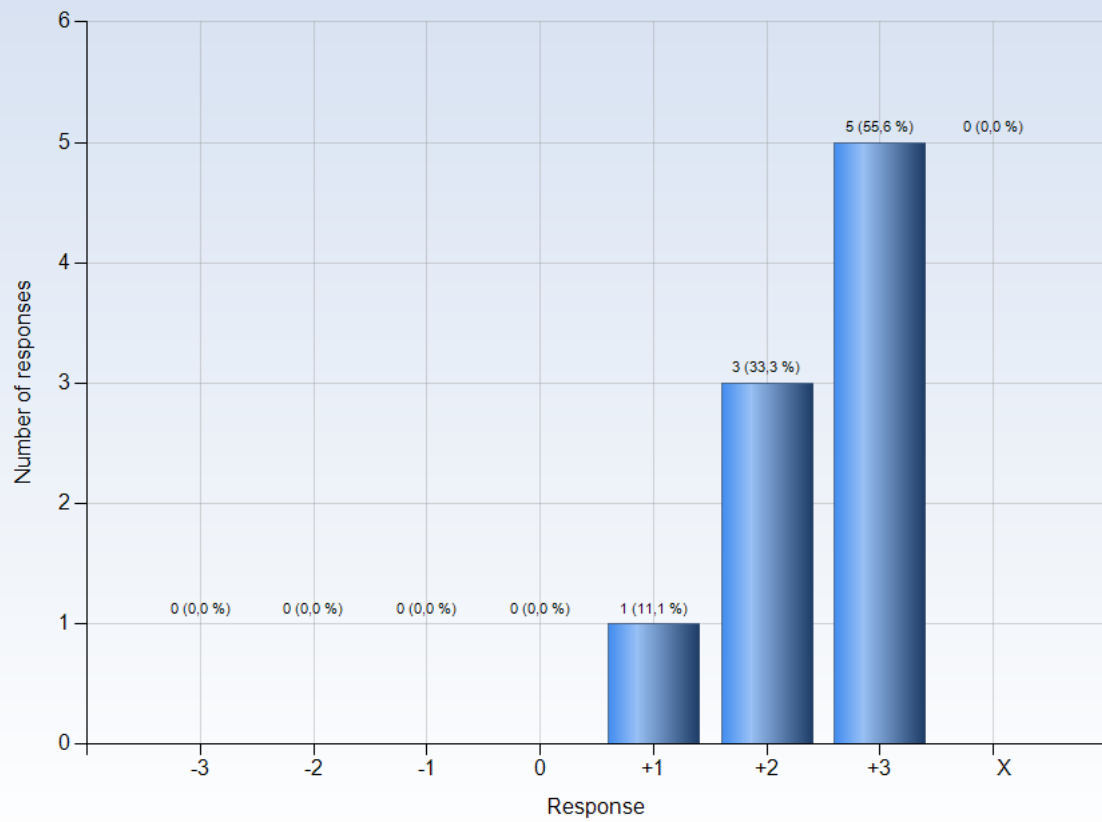
Comments

16. The assessment on the course was fair and honest
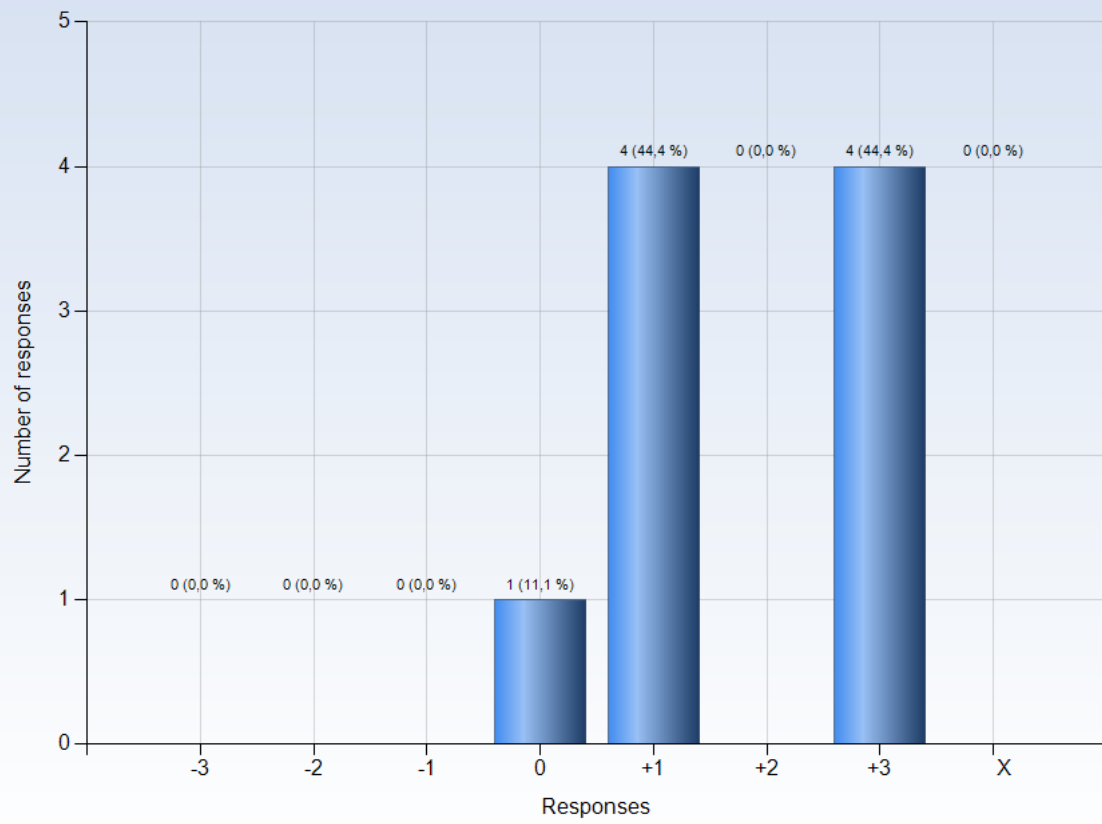
Comments

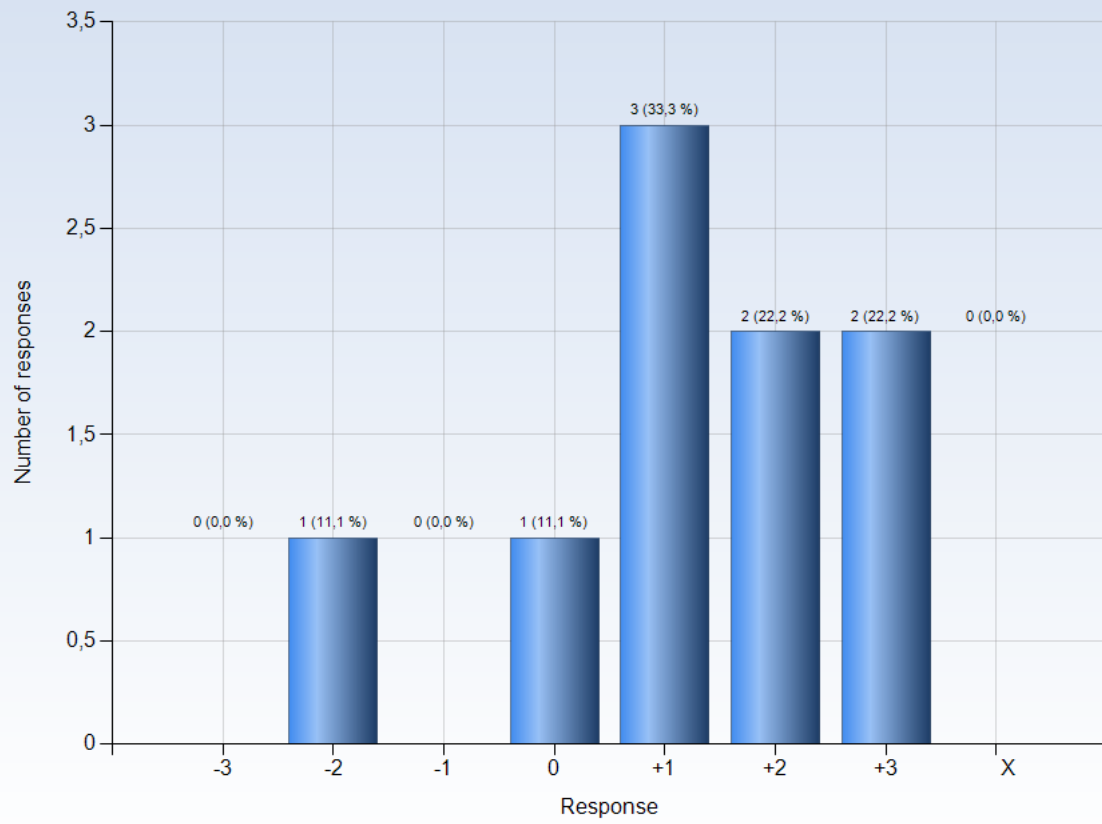## 17. My background knowledge was sufficient to follow the course

Number of responses vs Response

- -3: 0 (0,0 %)
- -2: 0 (0,0 %)
- -1: 1 (11,1 %)
- 0: 0 (0,0 %)
- +1: 1 (11,1 %)
- +2: 3 (33,3 %)
- +3: 4 (44,4 %)
- X: 0 (0,0 %)

Comments

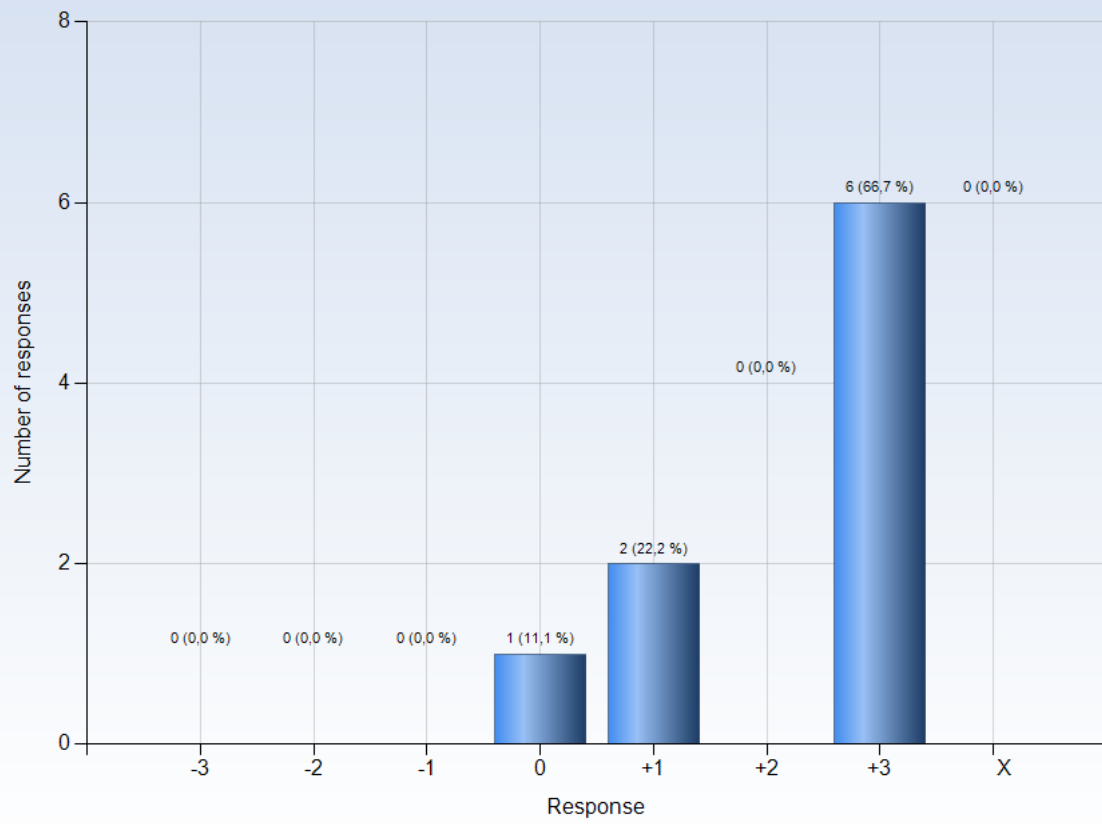Comments (My response was: +2)

Flight Camp was perfect for me who hadn't used ROS before.
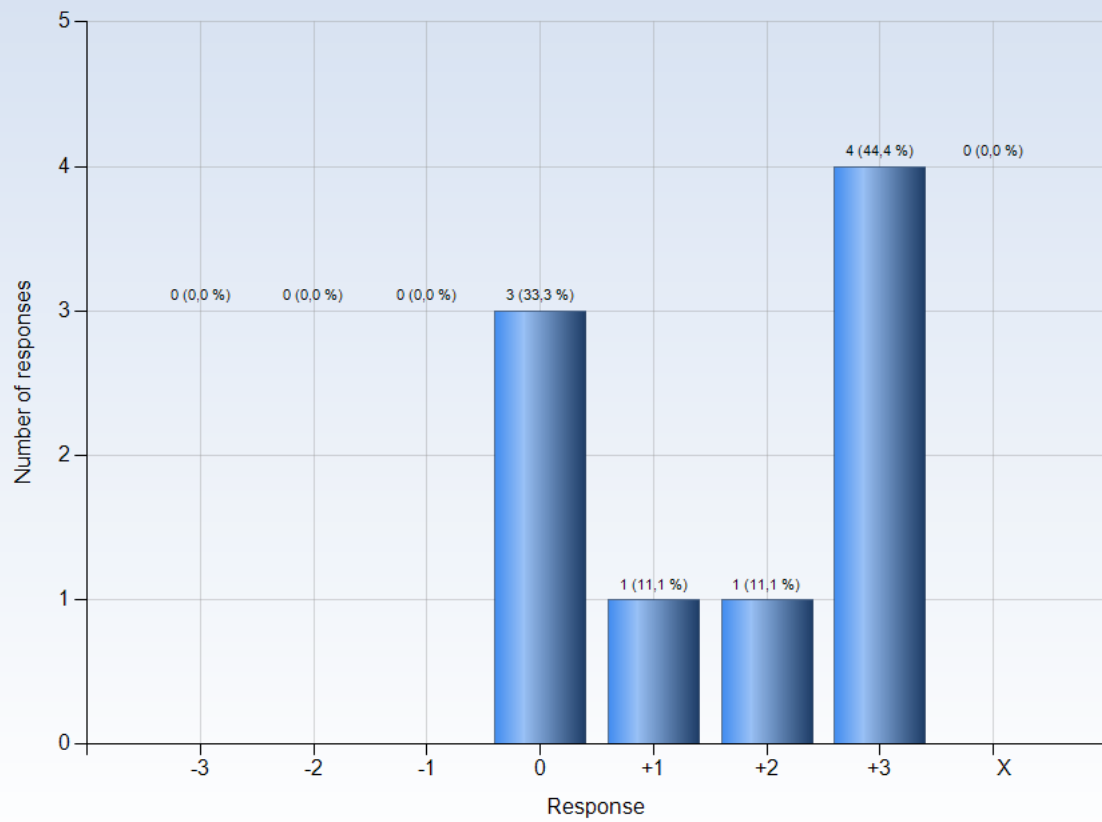
18. I regularly spent time to reflect on what I learned

Comments

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

Comments

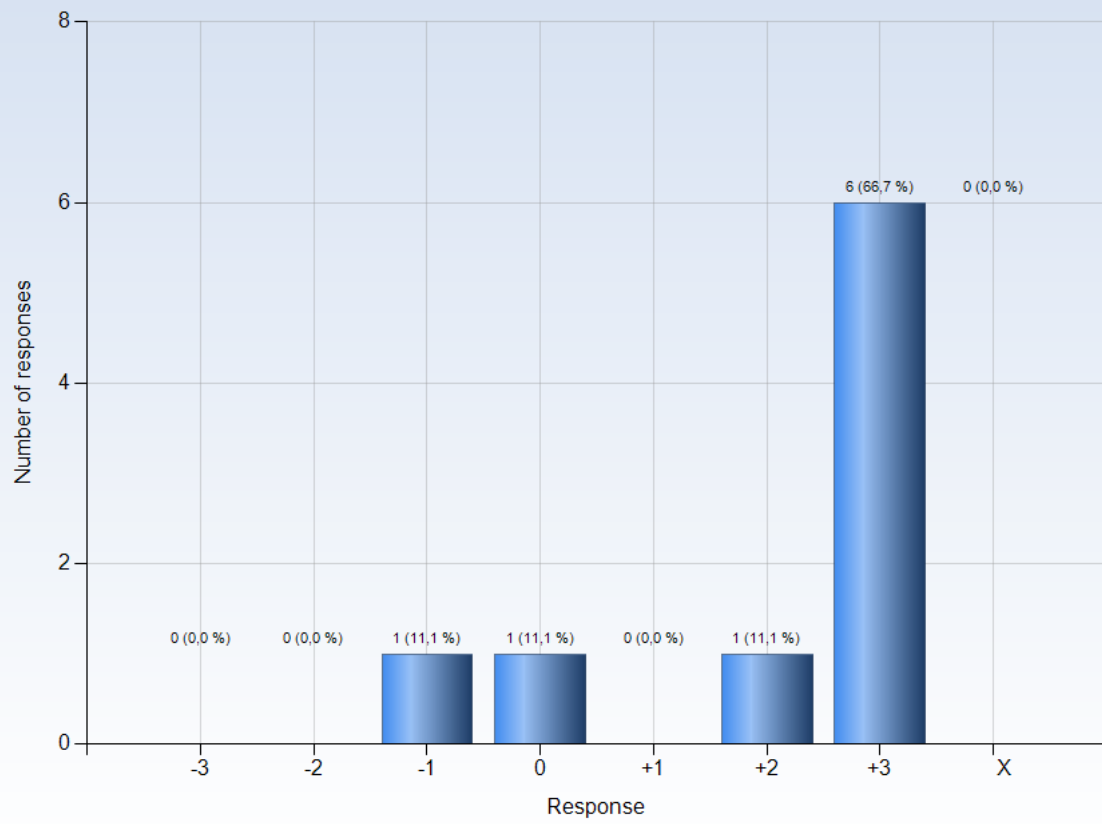## 20. I had opportunities to influence the course activities
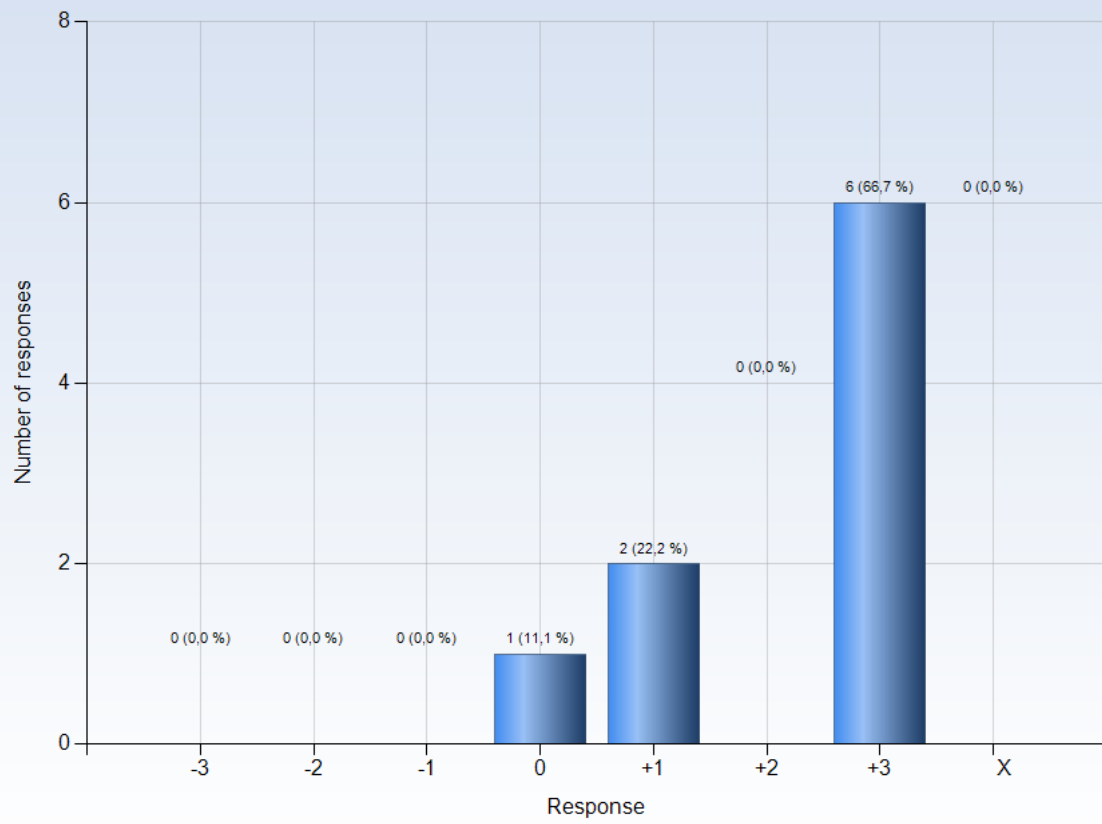

Comments

Comments (My response was: 0)

Not during phase 1 where the milestones railroaded us, but certainly in phase 2.

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

Comments

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

Number of responses

Response	-3	-2	-1	0	+1	+2	+3	X
	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)	1 (11,1 %)	2 (22,2 %)	0 (0,0 %)	6 (66,7 %)	0 (0,0 %)

Comments