# Report - IH1611 - 2017-02-20

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):**

Gunnar Malm, gunta@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 credits for the different parts of the examination were changed in the following way.
The written exam was reduced from 6 hp to 4.5 hp and the 1.5 hp difference was assigned to the student recitals.
In this way the student recitals are now a mandatory assessment that is mainly formative in character, while the written exam remains as the main summative assessment.

**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 median student response was in the 12-18 h/week bracket, which is slightly below the 20 h per week for a 7.5 hp course running in parallel with another 7.5 hp credit course. The number is relatively low, considering that the course has mandatory formative assessment, that would typically require several hours of work every week.

**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?**

This year 14 out of 21 registered students passed the written exam. One student did not appear and six failed. It seems that the exam was more difficult than previous years, since overall grades are rather low. On the other hand the students who failed had not grasped the fundamentals at all. That could partly be due to the mixed background some students have more EE courses already from their undergraduate studies and some are more materials science oriented.

**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 course runs smoothly. The changes in the course design have worked out as expected. They have not introduced any problematic issues. On the other hand the benefits of the changes are hard to judge after one single course round.

**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?**

The elements, that stand out in the polar diagram overview are the following items:
12. The course activities helped me to achieve the intended learning
outcomes efficiently (i)
14. I received regular feedback that helped me to see my progress (j)
20. I had opportunities to choose what to do (m)

This is in line with the general feeling that students know, what activities to spend time on, for efficient learning. But, this also reflects the fact that mandatory parts make the course less flexible. You cannot really choose freely how to plan your studies.

We are still looking for a convenient way to provide more individualized feedback. This request is a recurring feature from one year to the next and should be taken seriously.

**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 feedback in the student recitals needs to be improved. Students are not satisfied with the limited access to correct problem solutions. And they are also not satisfied with how the instructors comment on student performance. Overall a clearer message about the expected level and structure for correct solutions should be provided. The reading instructions should be clarified and also more emphasis should be put on the use on the tables of formulas and how to find needed data in the course book.

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

It is an ongoing work to put more focus on semiconductor memories, basic circuit applications and various sensors. This will make the course more suited for students who are not exposed to his content in any other part of their education. The students will get a working knowledge of the field as a whole.

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

The course has been run by /shared by two professors and that has worked out fine.

# Course data 2017-02-21

# IH1611 - Semiconductor Devices, HT 2016

## Course facts

| | |
|---|---|
| **Course start:** | 2016 w.44 |
| **Course end:** | 2017 w.3 |
| **Credits:** | 7,5 |
| **Examination:** | LABA - Laboration, 1.5, Grading scale: P, F<br>SEMA - Seminar, 1.5, Grading scale: P, F<br>TENA - Written Final Exam, 4.5, Grading scale: A, B, C, D, E, FX, F |
| **Grading scale:** | A, B, C, D, E, FX, F |

## Staff

| | |
|---|---|
| **Examiner:** | B Gunnar Malm <gunta@kth.se> |
| **Course responsible teacher:** | B Gunnar Malm <gunta@kth.se> |
| **Teachers:** | Anders Hallén <ahallen@kth.se> |
| **Assistants:** | |

## Number of students on the course offering

| | |
|---|---|
| **First-time registered:** | 18 |
| **Total number of registered:** | 23 |

## Achievements (only first-time registered students)

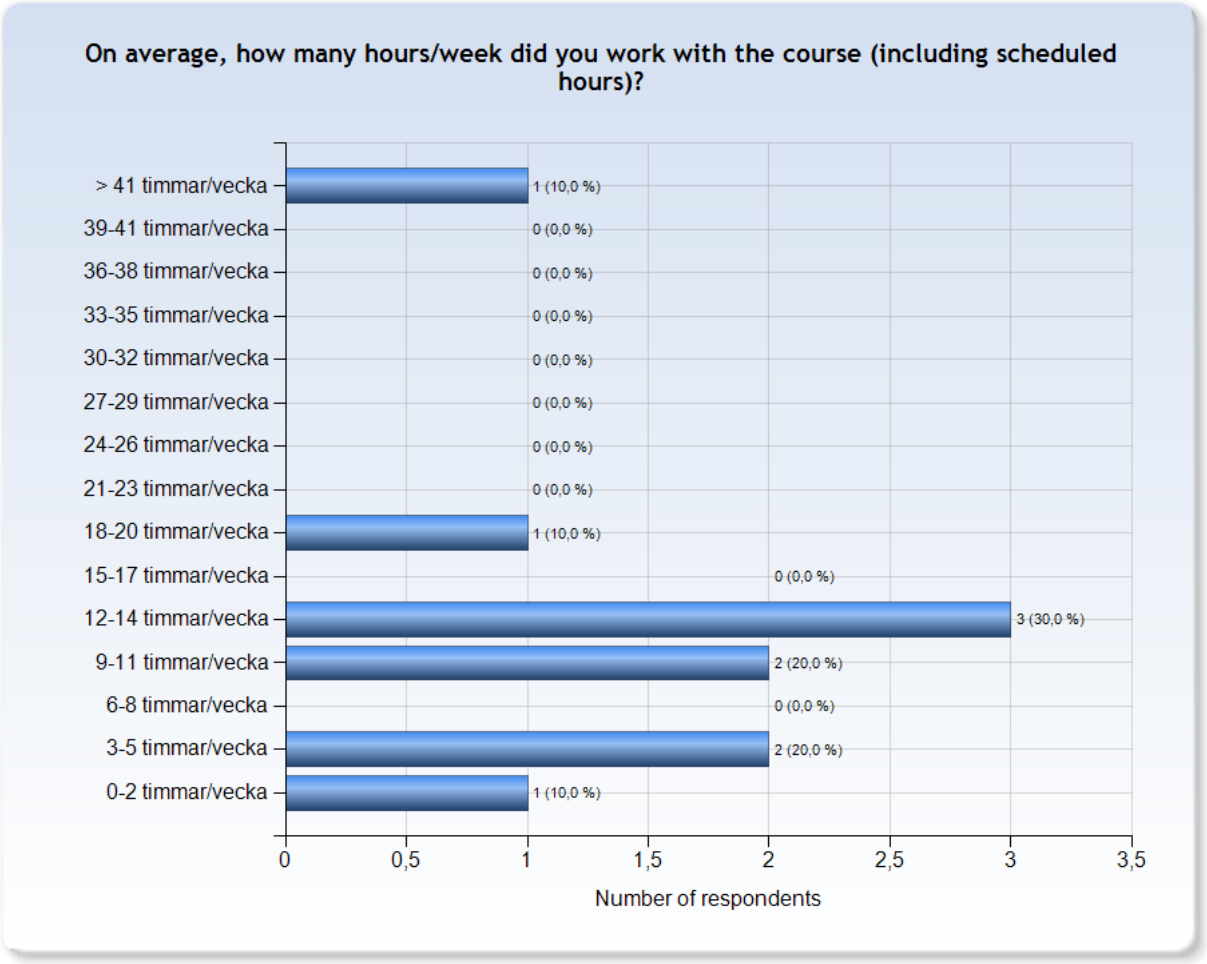
| | |
|---|---|
| **Pass rate[1] [%]** | 61.10% |
| **Performance rate[2] [%]** | 85.60% |
| **Grade distribution[3] [%, number]** | A 18% (2)<br>B 18% (2)<br>D 27% (3)<br>E 36% (4) |

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

# IH1611 - 2017-01-19

Antal respondenter: 20
Antal svar: 10
Svarsfrekvens: 50,00 %

# ESTIMATED WORKLOAD




**Comments**

| Comments (I worked: > 41 timmar/vecka) |
| --- |
| During the period we had several assignments (problem solving and laboratory experiment/report/peer review), but even so, the workload was comfortable but it wouldn't allow to study a lot for the course. These major studying moments had to be given before the exam (and the course outcomes are extensive). I do believe the 7,5 ECTS are suitable for the workload. |

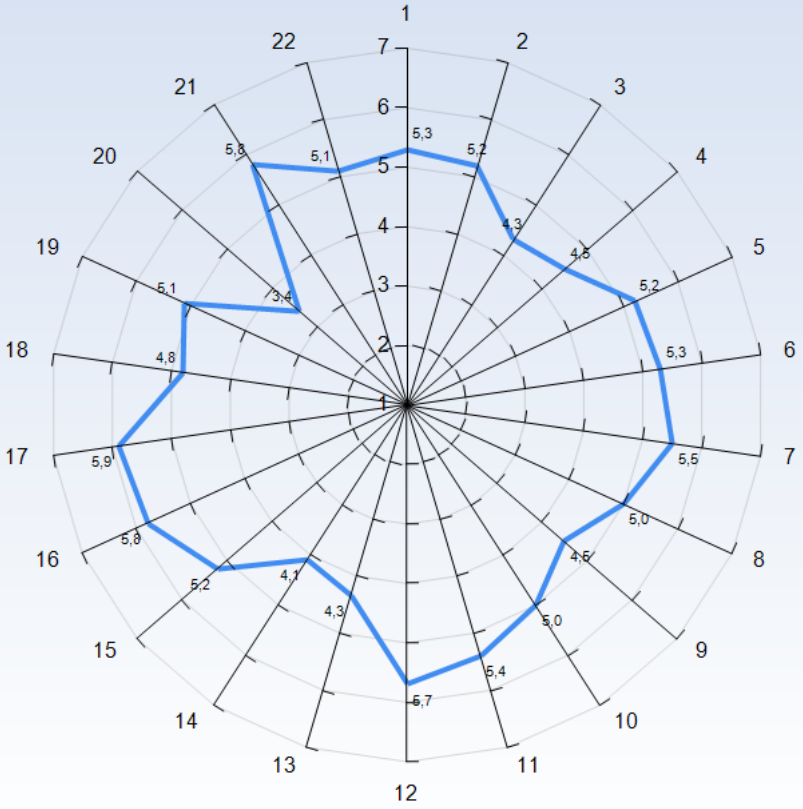
# LEARNING EXPERIENCE

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 v3.1.3

### 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. 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 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 choices*

19. I was able to learn in a way that suited me (m)
20. I had opportunities to choose what to do (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, 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 intended learning outcomes, 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 intended learning outcomes

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**

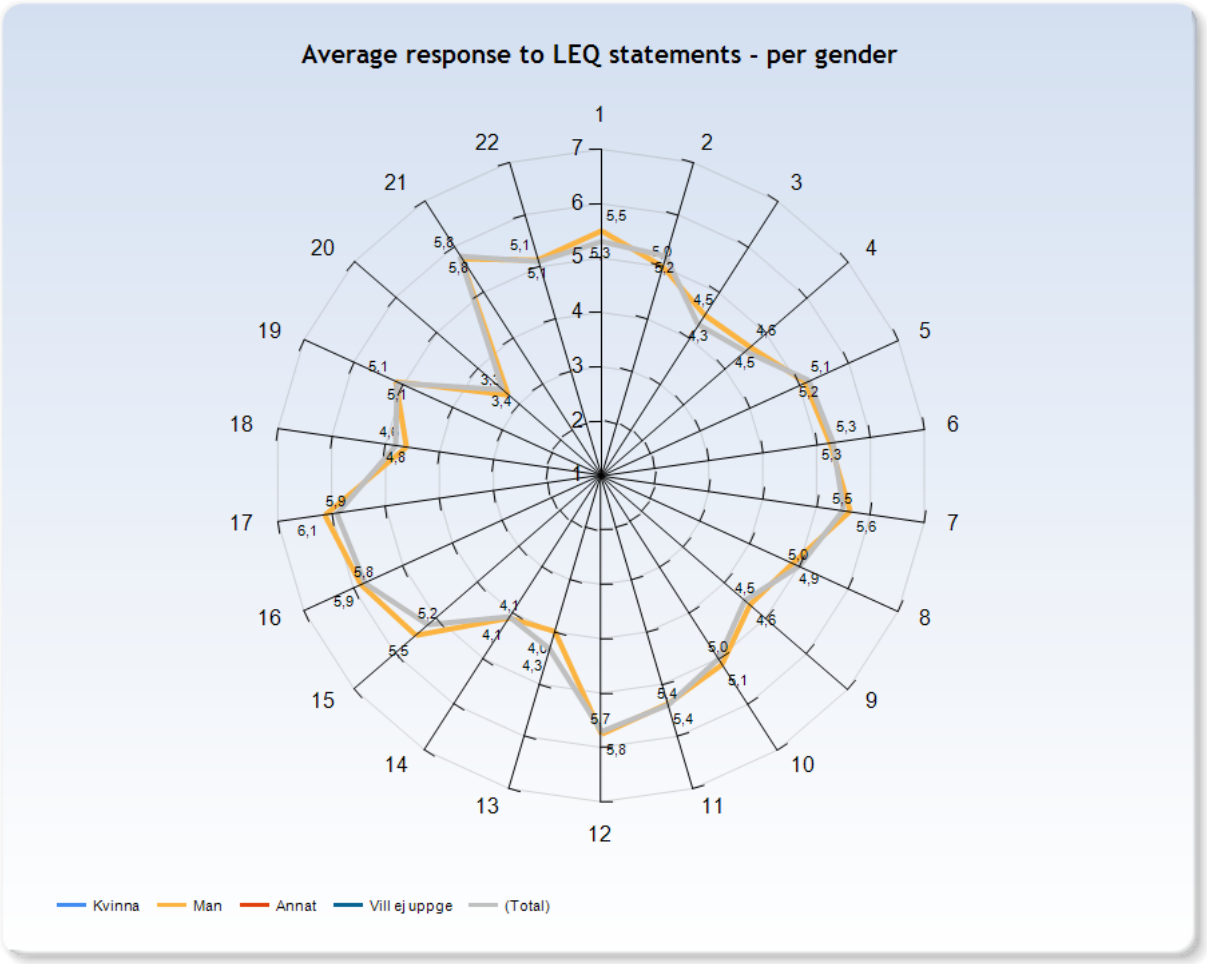
Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

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

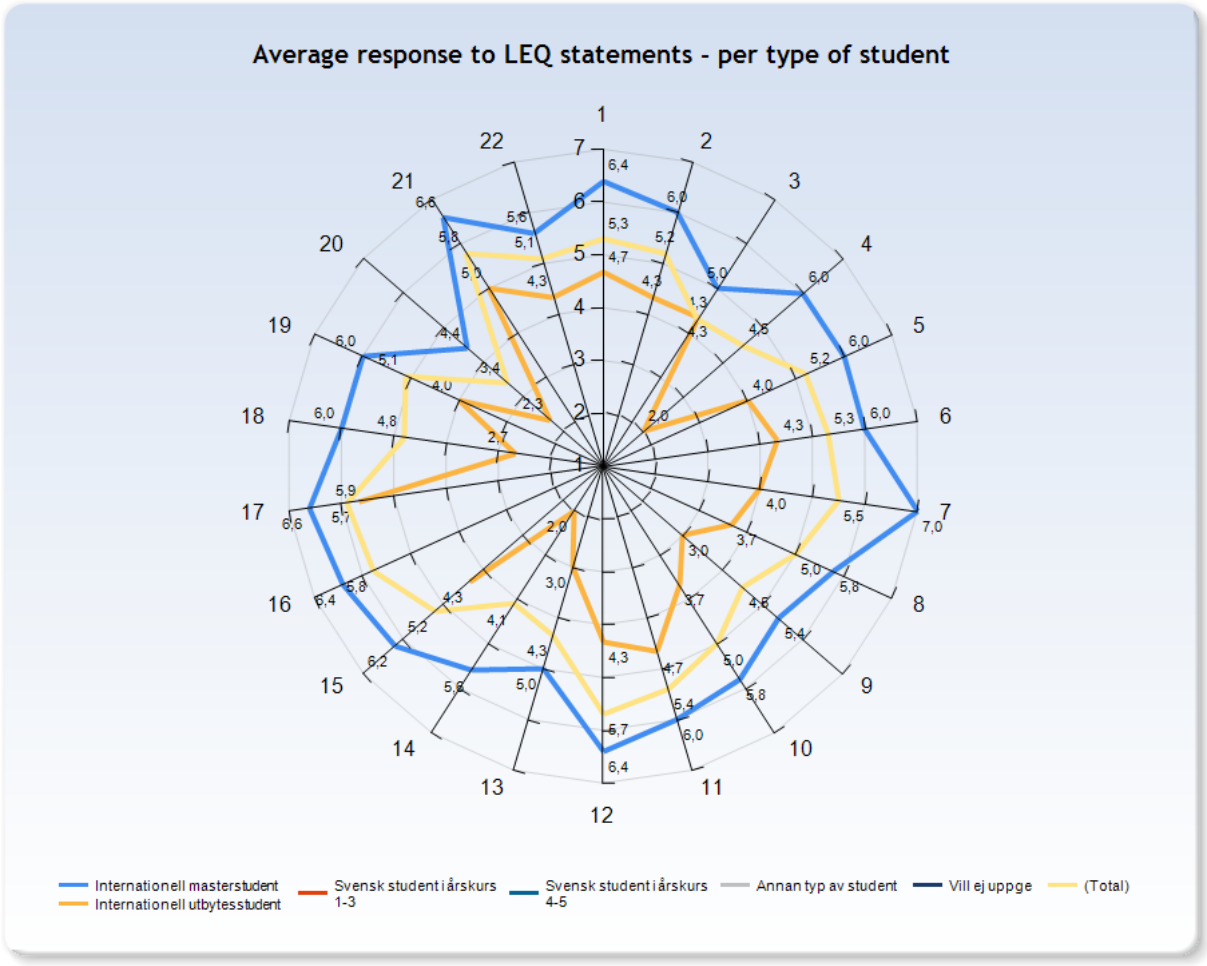
Elmgren, M. & Henriksson, A-S. (2014). *Academic Teaching*, Chapter 3, pp. 57-72. Lund: Studentlitteratur.

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
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
Kvinna
Man
Annat
Vill ej uppge
(Total)

**Comments**


Average response to LEQ statements - per type of student
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: 9-11 timmar/vecka)

Seminarierna var väldigt användbara. Föreläsningarna gick igenom kursen bra.

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

Content of the course - I've acquired a good amount of knowledge in the semiconductors area which will be very important for the next courses.

The lectures

What was the best aspect of the course? (I worked: > 41 timmar/vecka)

The course's content itself is very interesting and useful. I do believe the course is well structured (with the right evaluation/work moments) and the workload is appropriate.
In general, I am very satisfied with the course.

**What would you suggest to improve?**

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

Give the answers to the exercises. Or at least the assistant should give us the right path to take. No just sit and say: mmh that's interesting and then don't even say if it is correct

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

Give the answers of the exercises !!

Prof. Malm should work on his presentation skills, his voice is impossible to hear, he speaks in constant tone which makes it harder to listen..

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

Tentan kunde ha haft fler räkneuppgifter då det var det som jag tror de flesta hade övat på.

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

Recitations. Although I've learned from them, the resolution for some exercises was not clear. Only while studying for the exam did I understand what some exercises tried to describe and connect different chapters.

The laboratory experience

What would you suggest to improve? (I worked: > 41 timmar/vecka)

The recitations could be improved, since sometimes students would go to the board to solve the problem without being sure of it - and the Professor's corrections wouldn't allow other students to understand which was the correct way to solve the problem.

Another problem, also related to recitations (but that was only noticed in the last recitation), is that the students didn't know which information they should use. On the one hand, some students used formulas from the book that were already derived (and the Professor would correct those students, warning them that the only formulas they could use were the ones in the Formula sheet). On the same lecture where this happen, to solve some of the problems we had to go to the book to use values from it (without having it said in the problem), which is not coherent since it seemed that some of the things we could see on the book and some others we couldn't. When a student exposed that to the Professor, his answer was "Now you know", which is also not correct since some of the student weren't able to do some of the exercises because they though they couldn't use values that were not in the Formula Sheet - and those exercises were part of the grading.

**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)

Read the book

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

Gör seminarierna, följ med i lektionerna

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

Attend most of the lectures and recitations and try to keep up with the pace while studying the chapters at home. It's best if it's done before the lecture.

Take a lot effort in the student recitation

**Is there anything else you would like to add?**

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

| Is there anything else you would like to add? (I worked: 3-5 timmar/vecka) |
| --- |
| Give the answers of the exercises (again) !! And actually correct them during the exercises sessions, a "it seems right but I'm not sure" shouldn't be an acceptable answer from the assistant. |

| Is there anything else you would like to add? (I worked: 12-14 timmar/vecka) |
| --- |
| I didn't feel it was fair to be evaluated Chapter 3 in the exam when it was not even spoken in class. Yes, it was mentioned in the course PM, but most of the students were caught by surprise in the exam. |

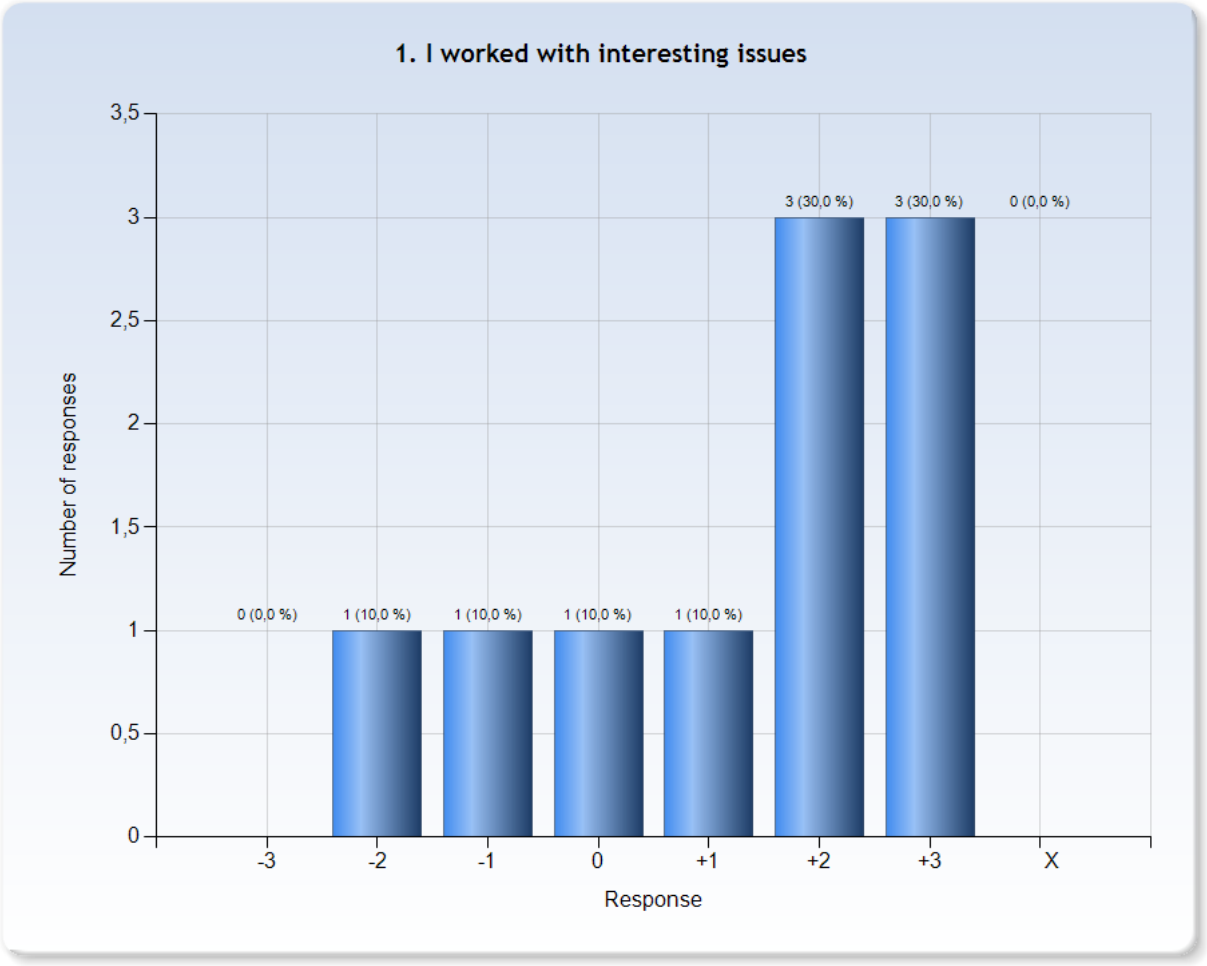
# SPECIFIC QUESTIONS

# RESPONSE DATA

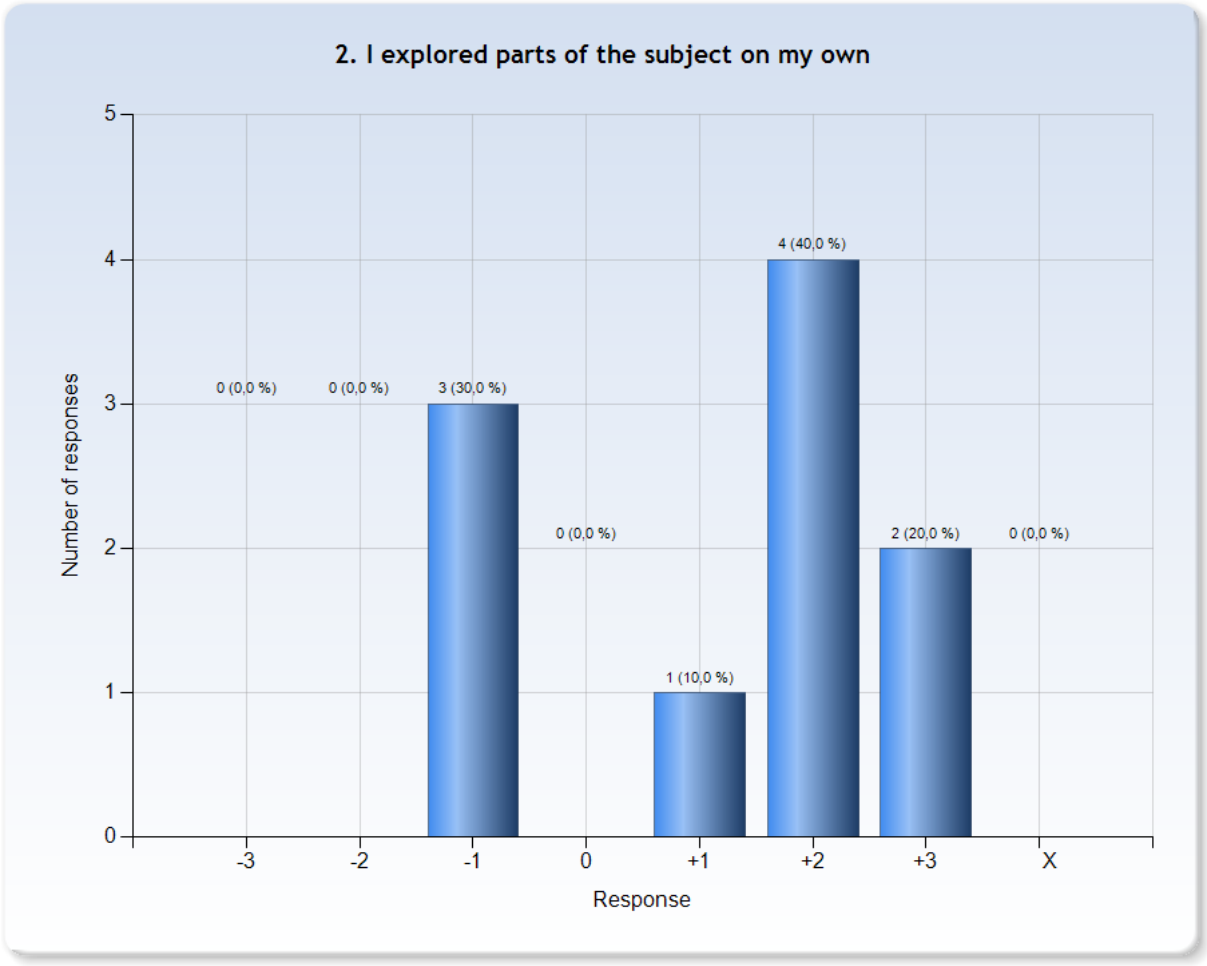
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-3 = No, I strongly disagree with the statement
0 = I am neutral to the statement
+3 = Yes, I strongly agree with the statement

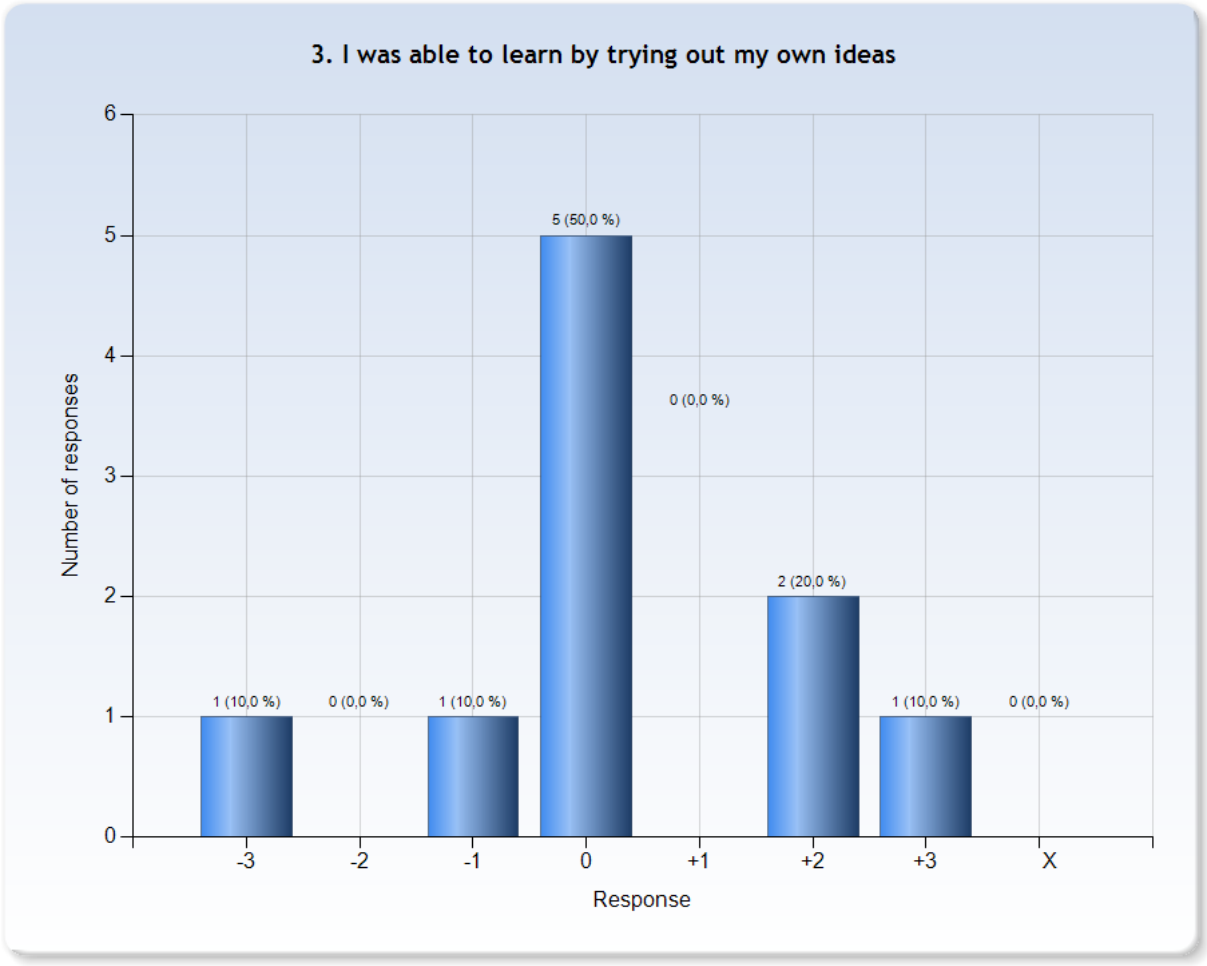
X = I decline to take a position on the statement



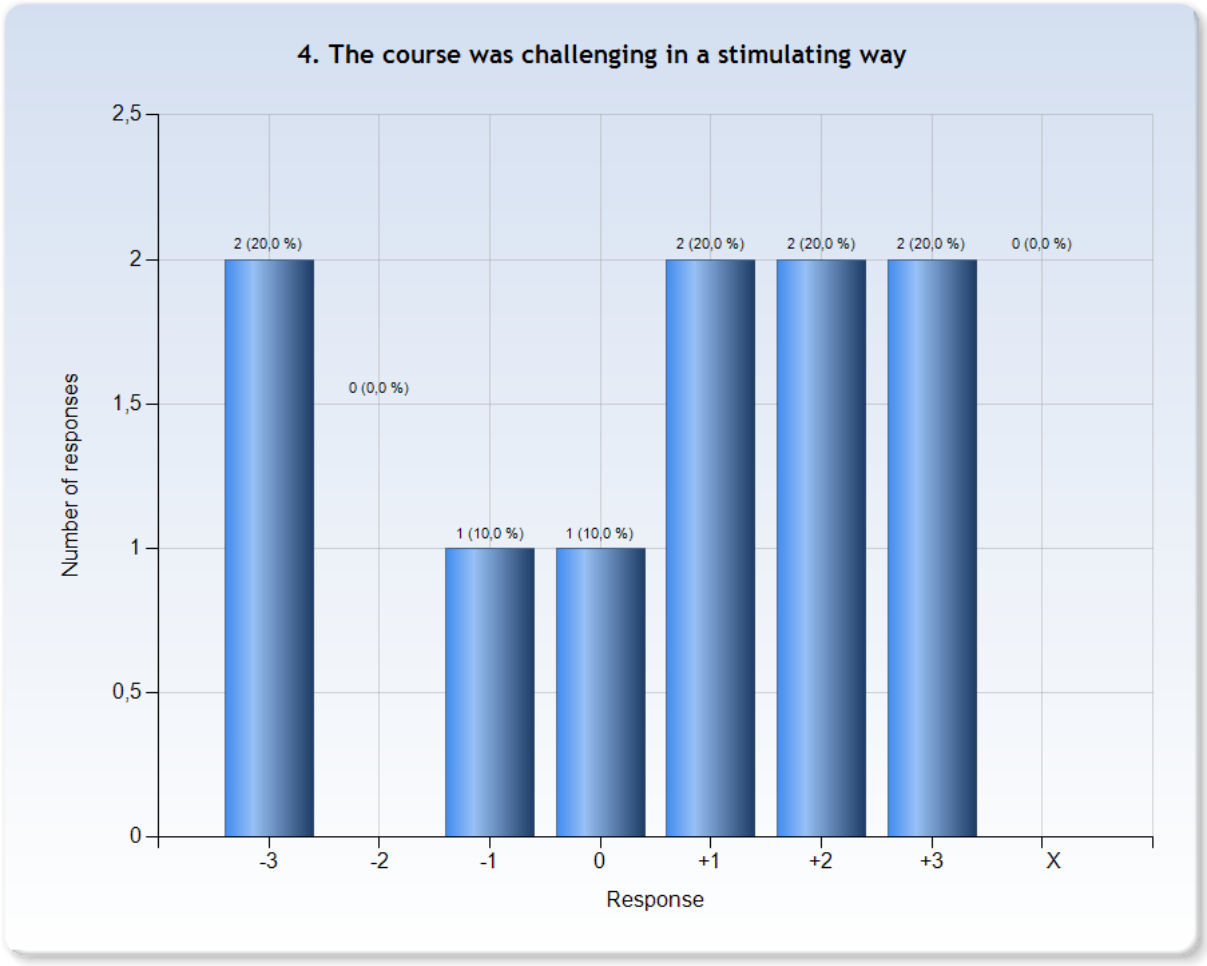

**Comments**


2. I explored parts of the subject on my own
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
3 (30,0 %)
0 (0,0 %)
1 (10,0 %)
4 (40,0 %)
2 (20,0 %)
0 (0,0 %)

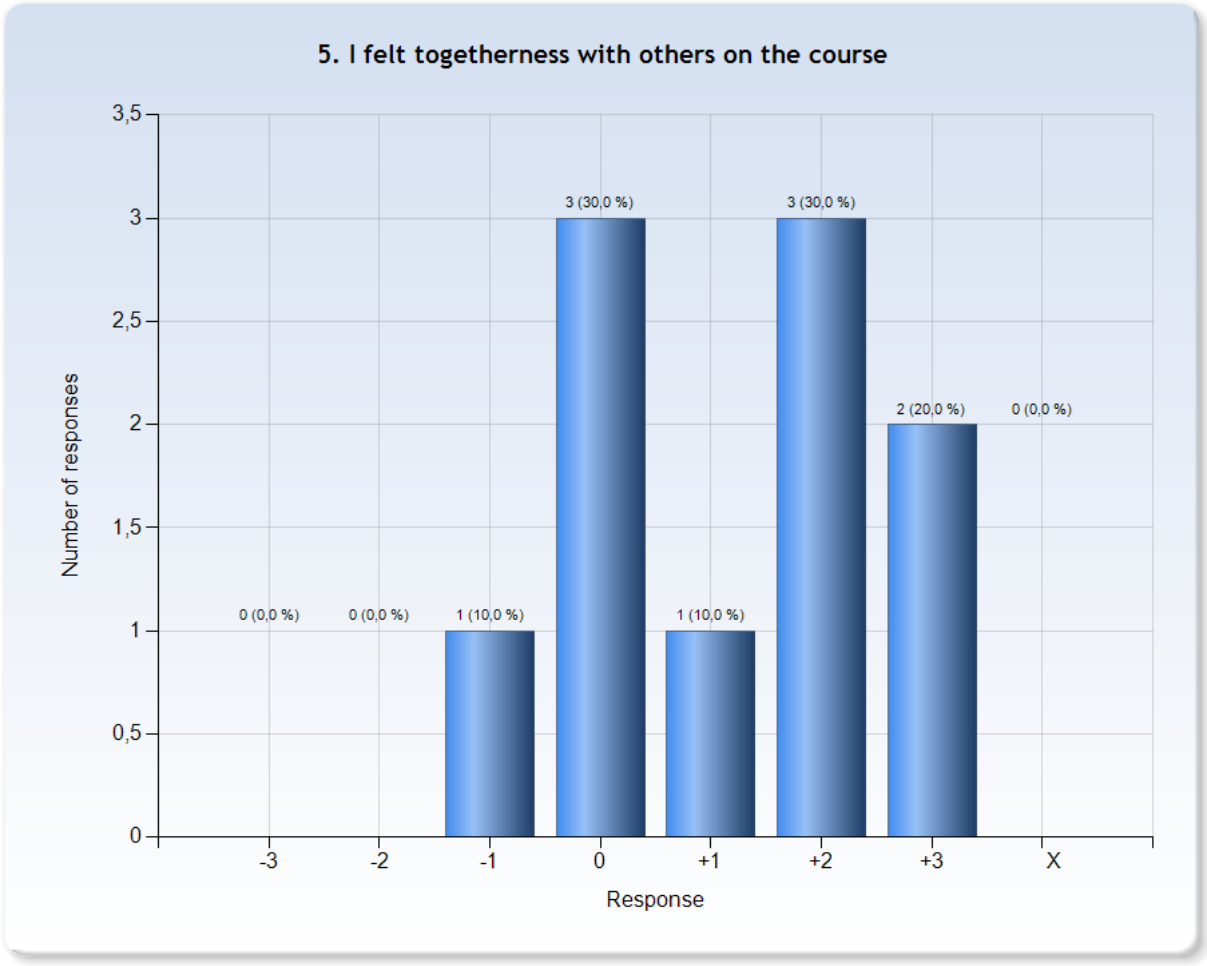
**Comments**


3. I was able to learn by trying out my own ideas
Number of responses
Response
0
1
2
3
4
5
6
-3
-2
-1
0
+1
+2
+3
X
1 (10,0 %)
0 (0,0 %)
1 (10,0 %)
5 (50,0 %)
0 (0,0 %)
2 (20,0 %)
1 (10,0 %)
0 (0,0 %)

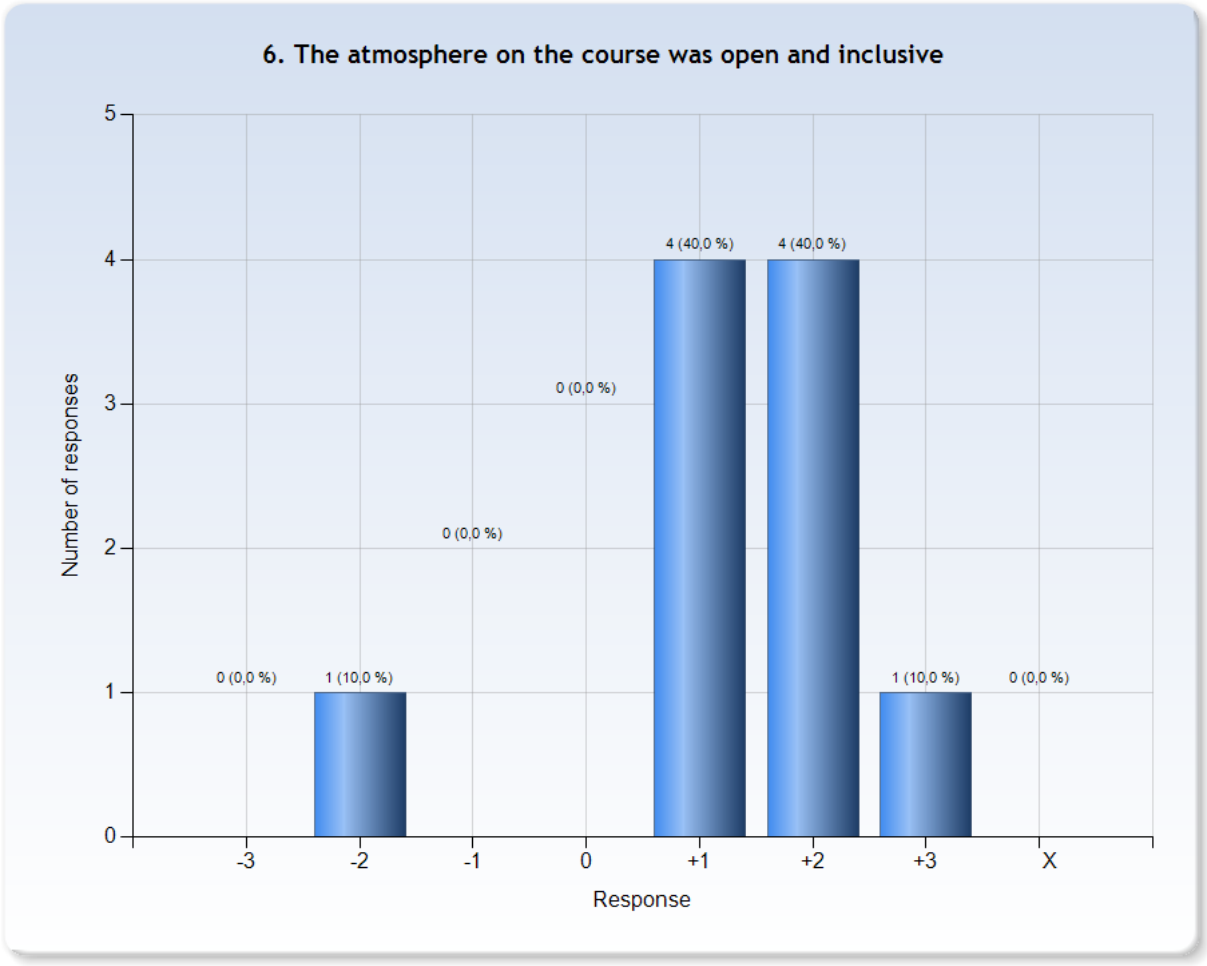
**Comments**


4. The course was challenging in a stimulating way
Number of responses
2,5
2
1,5
1
0,5
0
2 (20,0 %)
0 (0,0 %)
1 (10,0 %)
1 (10,0 %)
2 (20,0 %)
2 (20,0 %)
2 (20,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**

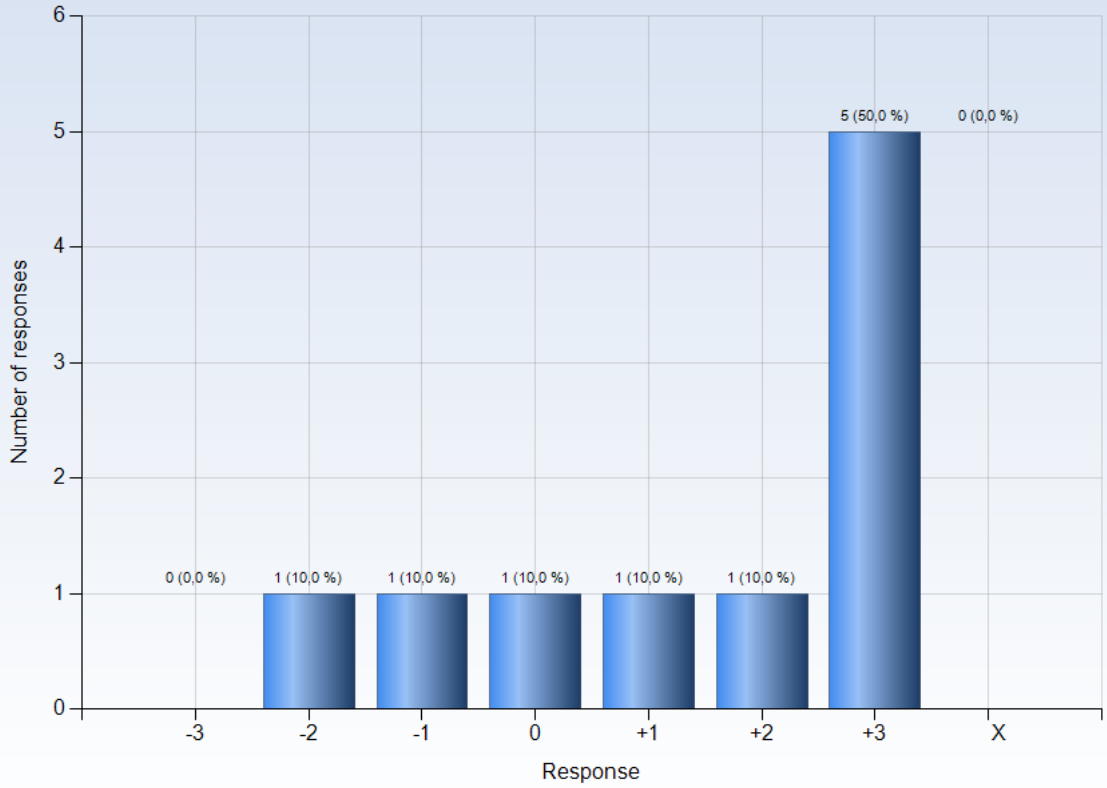

5. I felt togetherness with others on the course
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
1 (10,0 %)
3 (30,0 %)
1 (10,0 %)
3 (30,0 %)
2 (20,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**

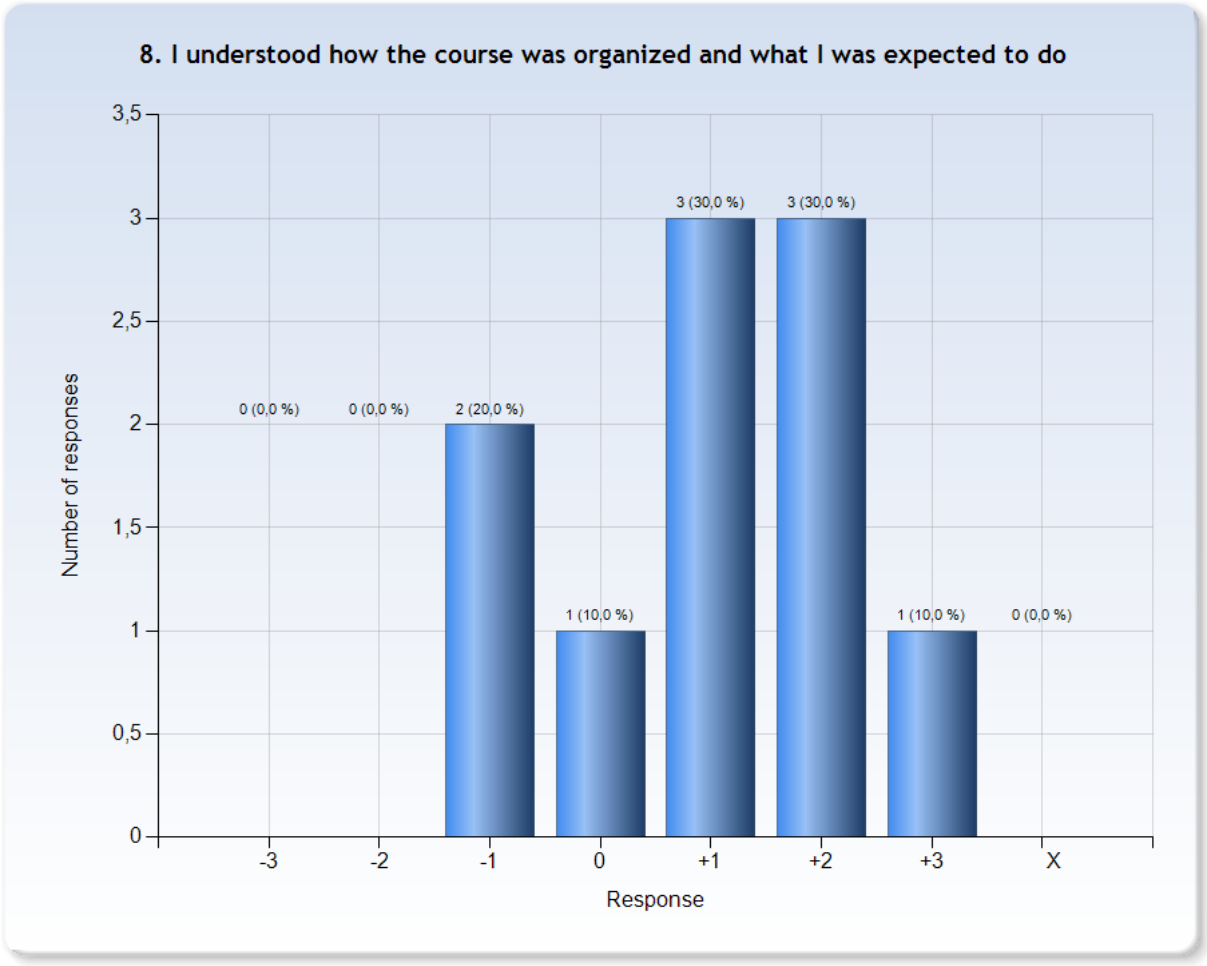

6. The atmosphere on the course was open and inclusive
Number of responses
Response
0 (0,0 %)
1 (10,0 %)
0 (0,0 %)
0 (0,0 %)
4 (40,0 %)
4 (40,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

**Comments**

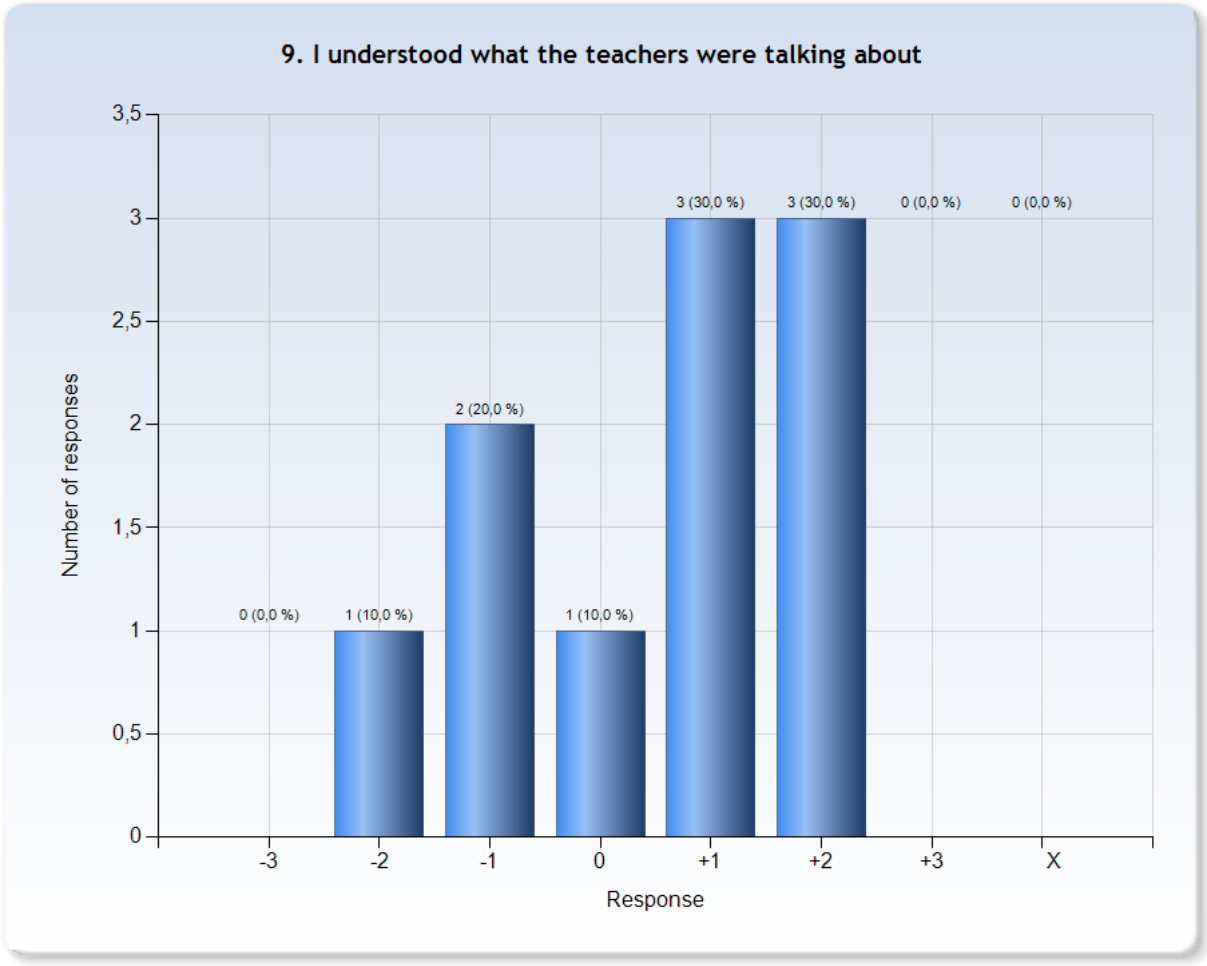
## 7. The intended learning outcomes helped me to understand what I was expected to achieve



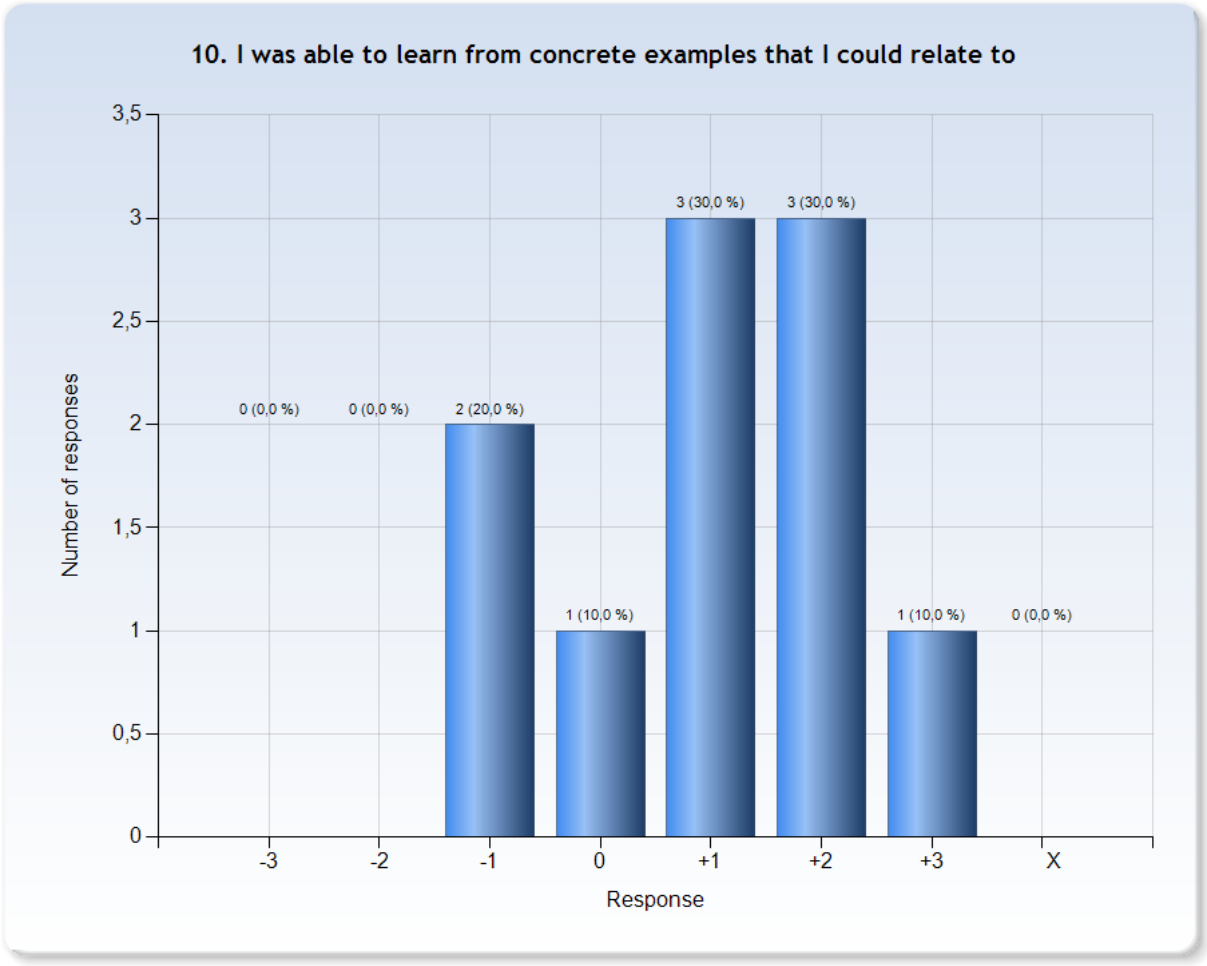

**Comments**


8. I understood how the course was organized and what I was expected to do
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
2 (20,0 %)
1 (10,0 %)
3 (30,0 %)
3 (30,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

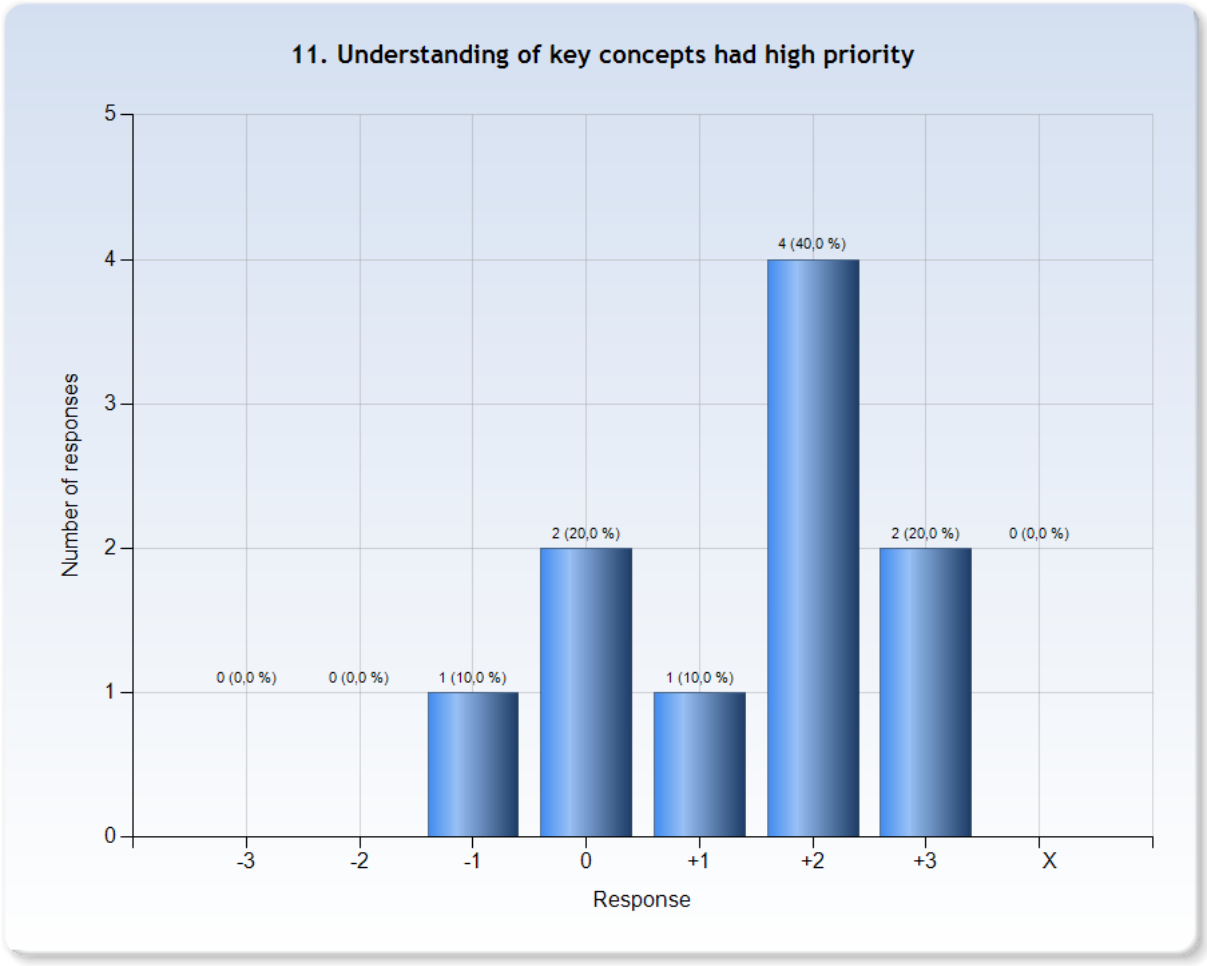
**Comments**


9. I understood what the teachers were talking about
3,5
3
2,5
2
1,5
1
0,5
0
Number of responses
0 (0,0 %)
1 (10,0 %)
2 (20,0 %)
1 (10,0 %)
3 (30,0 %)
3 (30,0 %)
0 (0,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**

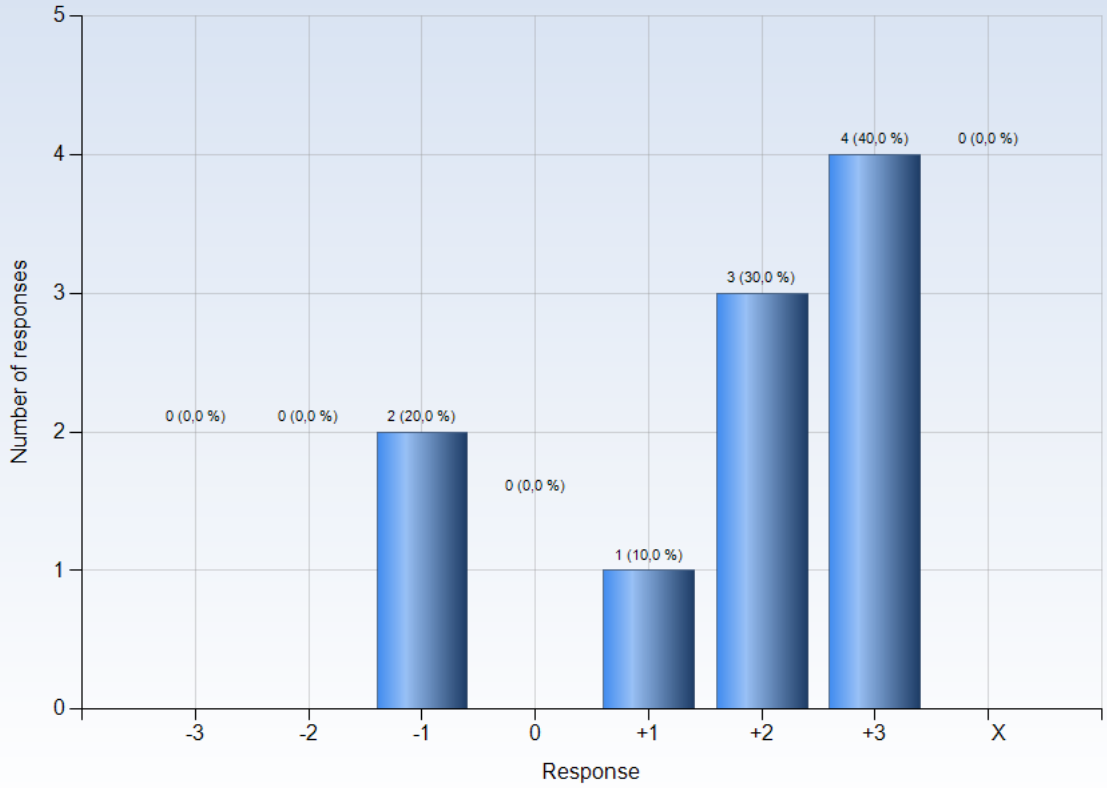

10. I was able to learn from concrete examples that I could relate to
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
2 (20,0 %)
1 (10,0 %)
3 (30,0 %)
3 (30,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**

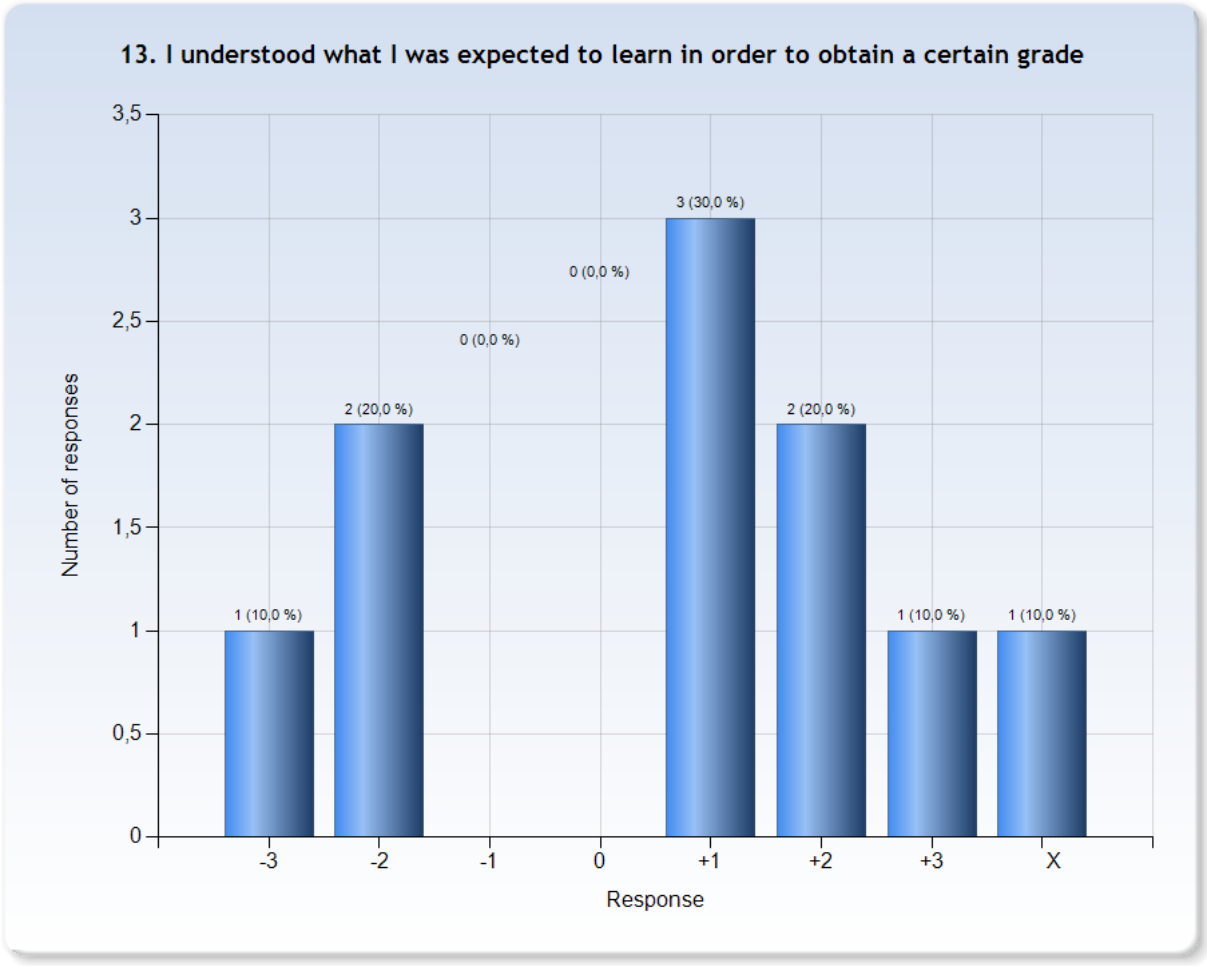

11. Understanding of key concepts had high priority
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
1 (10,0 %)
2 (20,0 %)
1 (10,0 %)
4 (40,0 %)
2 (20,0 %)
0 (0,0 %)

**Comments**

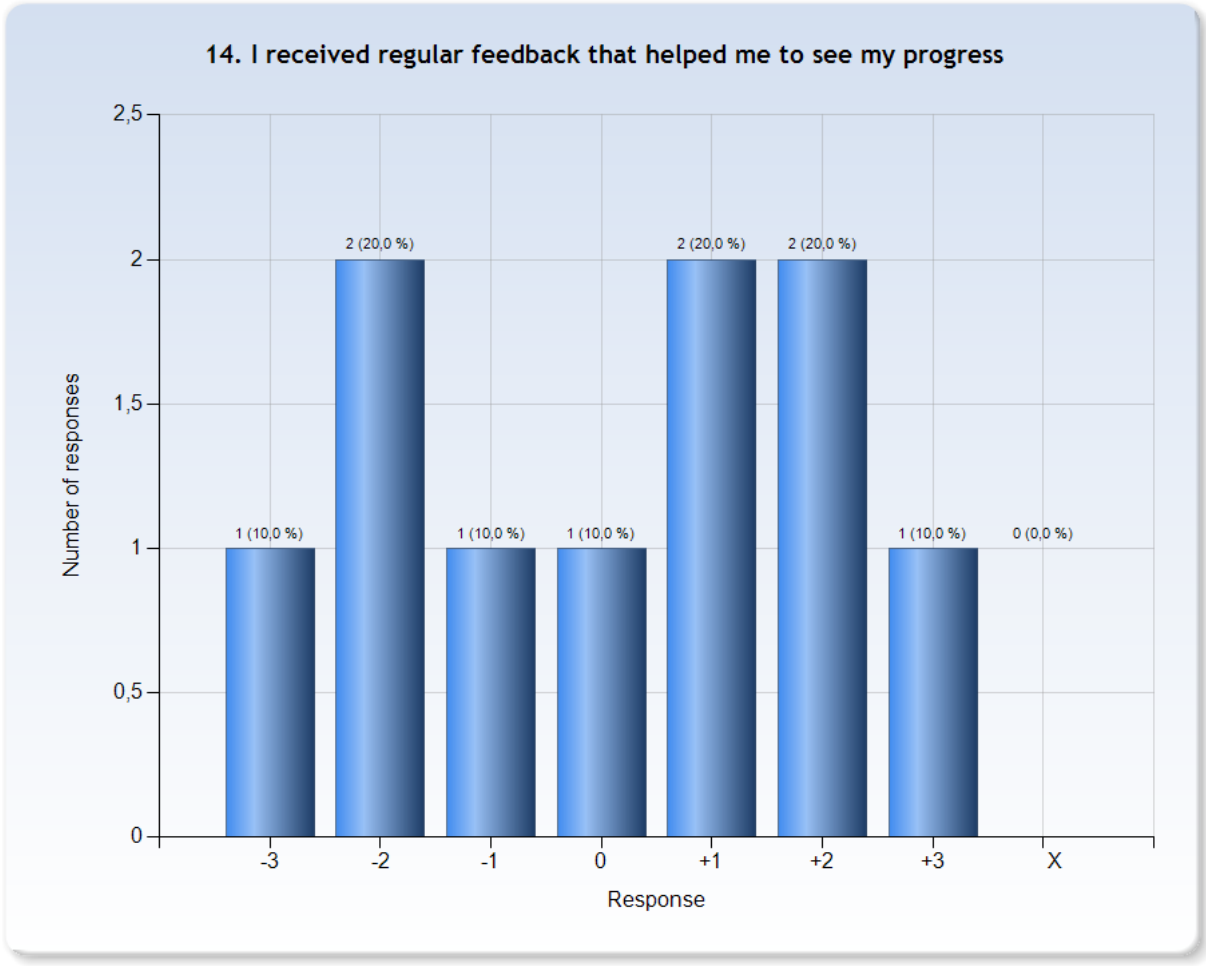
## 12. The course activities helped me to achieve the intended learning outcomes efficiently



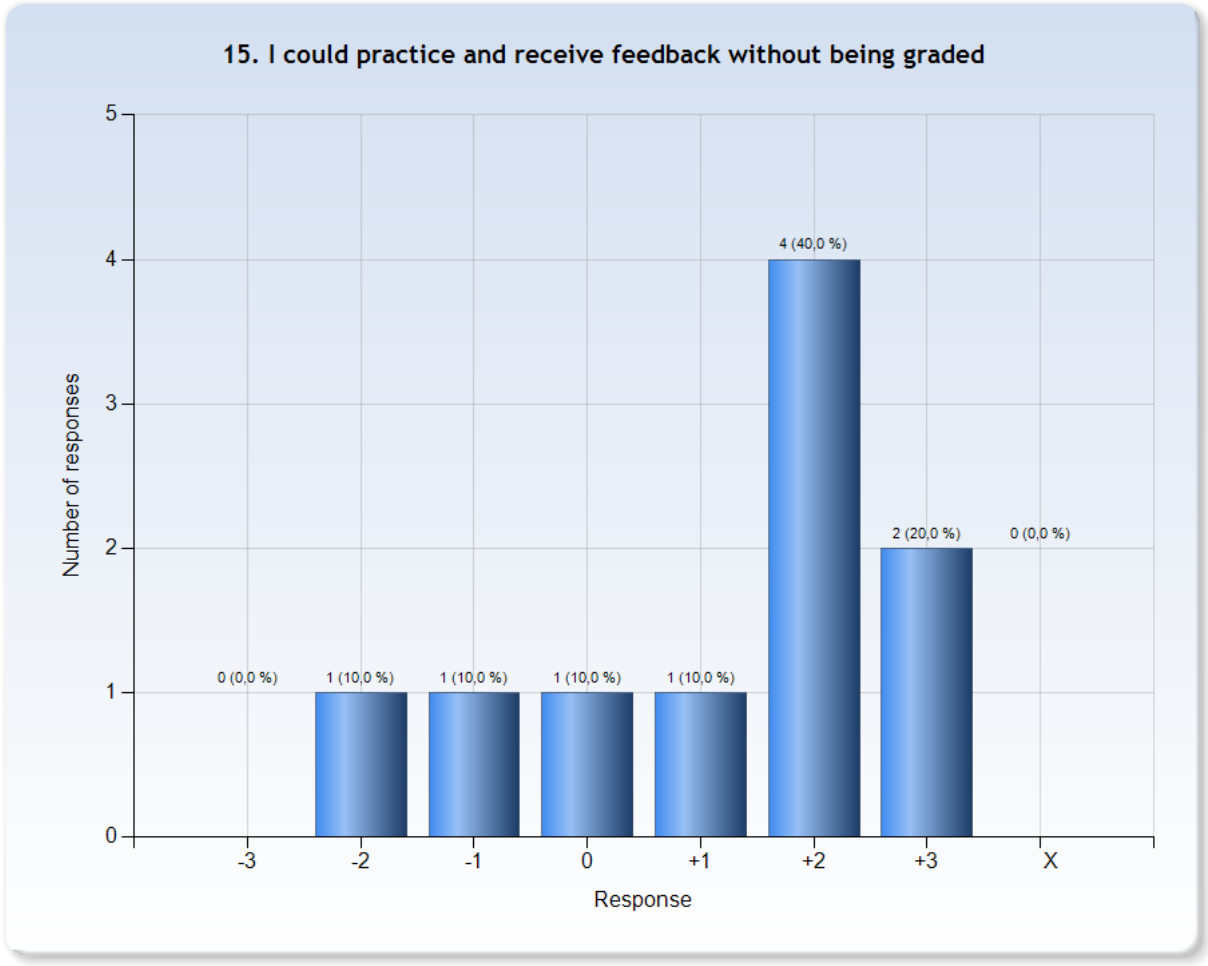

**Comments**


13. I understood what I was expected to learn in order to obtain a certain grade
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
1 (10,0 %)
2 (20,0 %)
0 (0,0 %)
0 (0,0 %)
3 (30,0 %)
2 (20,0 %)
1 (10,0 %)
1 (10,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

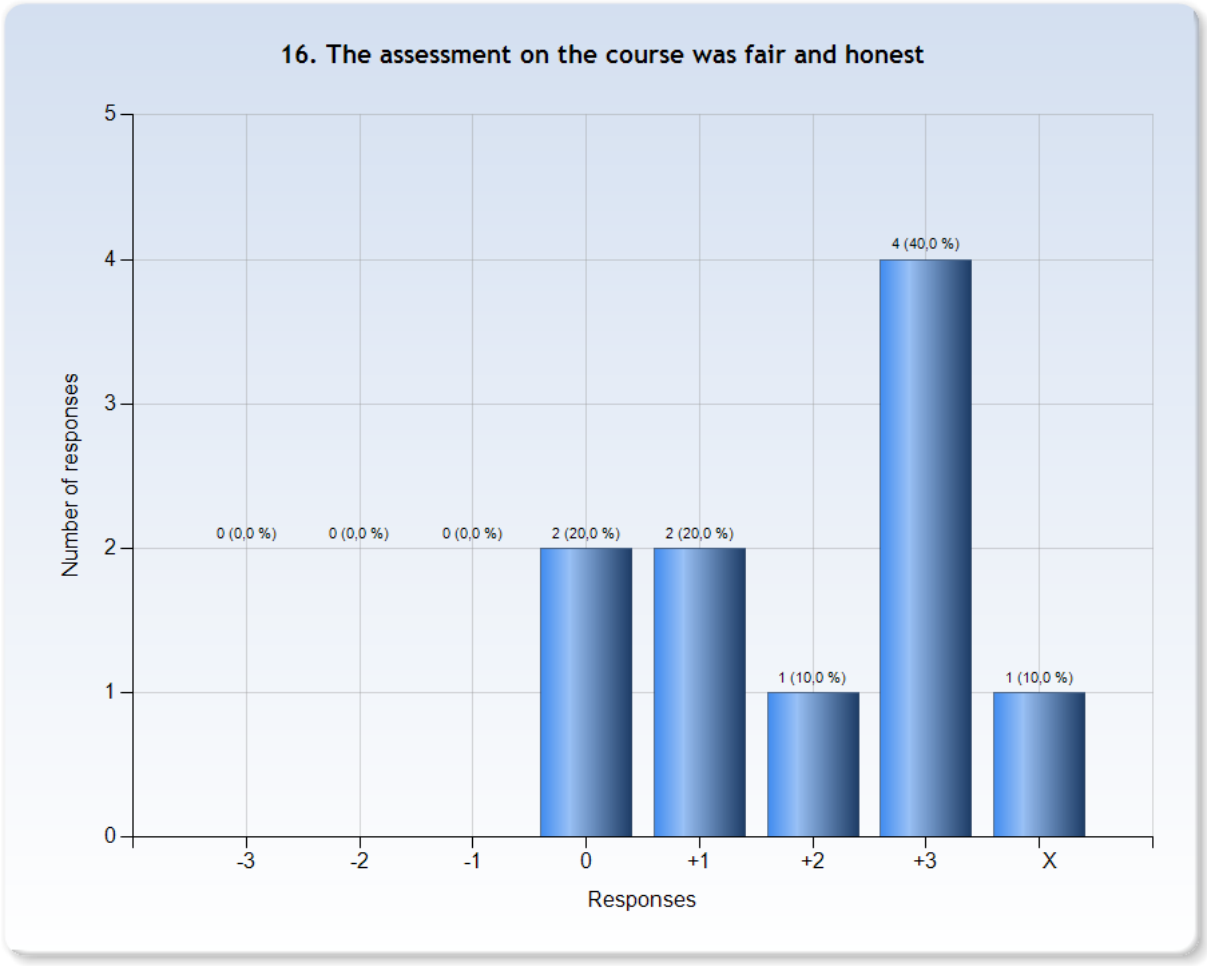
**Comments**


14. I received regular feedback that helped me to see my progress
Number of responses
2,5
2
1,5
1
0,5
0
1 (10,0 %)
2 (20,0 %)
1 (10,0 %)
1 (10,0 %)
2 (20,0 %)
2 (20,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

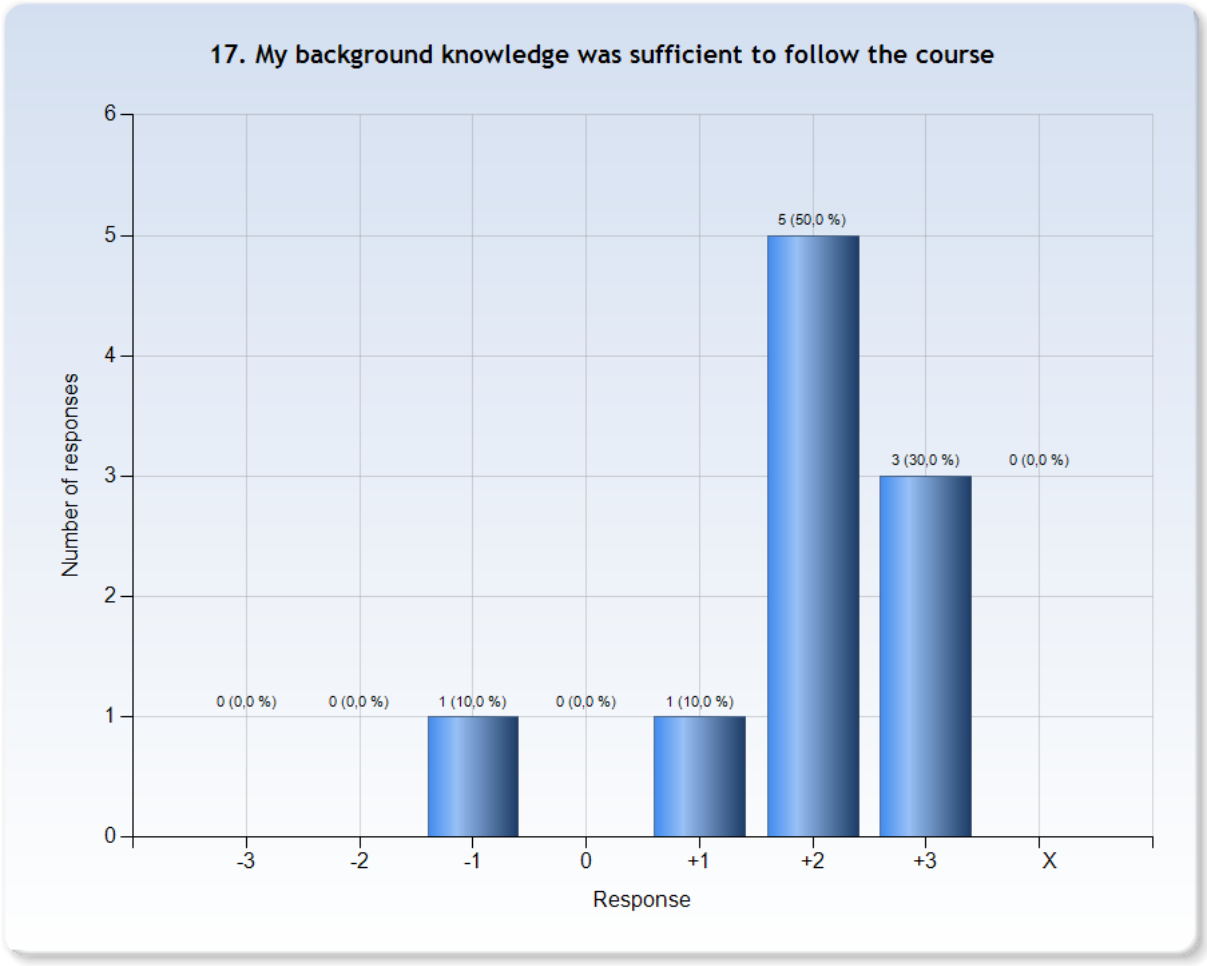
**Comments**


15. I could practice and receive feedback without being graded
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
1 (10,0 %)
1 (10,0 %)
1 (10,0 %)
1 (10,0 %)
4 (40,0 %)
2 (20,0 %)
0 (0,0 %)

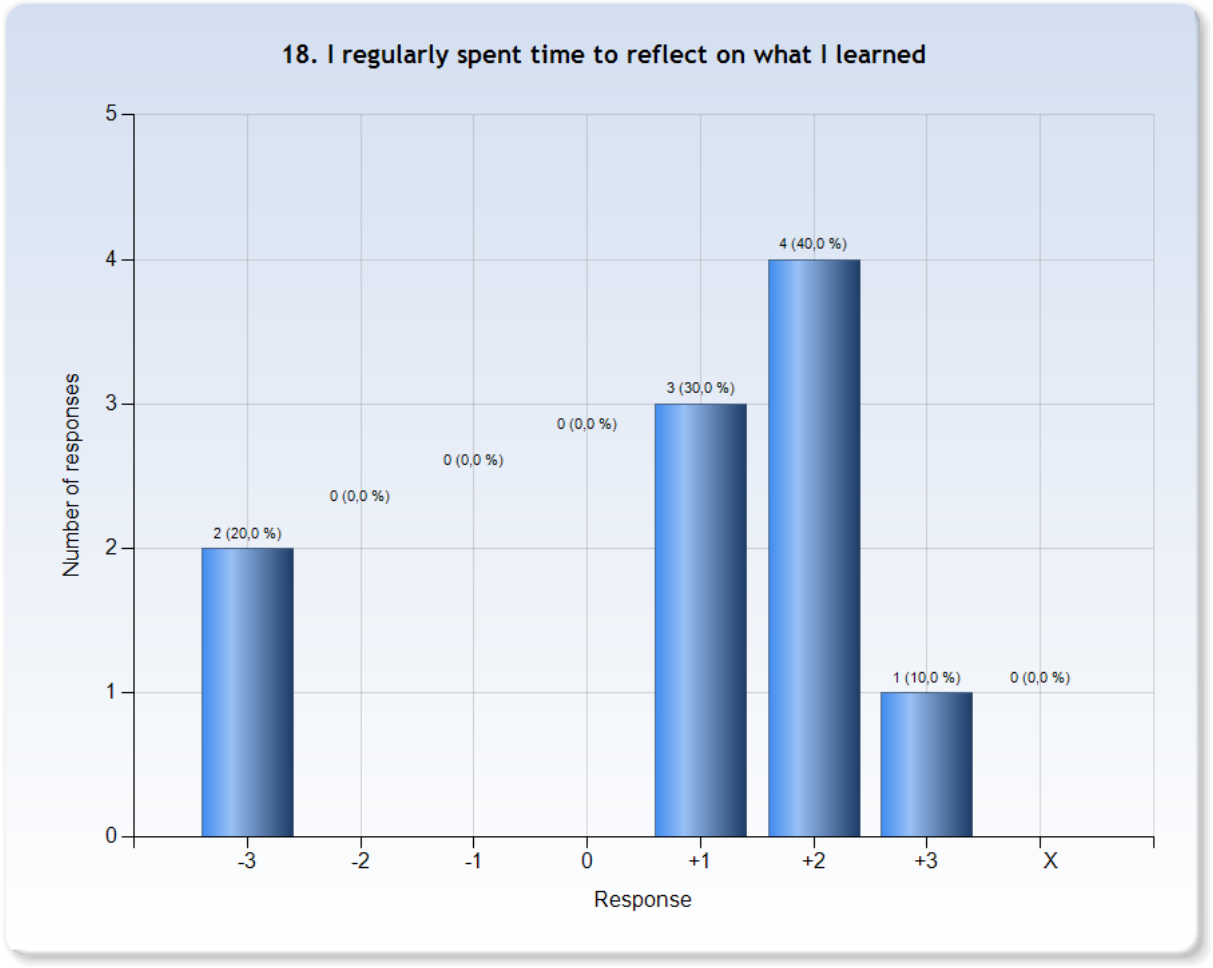
**Comments**


16. The assessment on the course was fair and honest
Number of responses
Responses
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
2 (20,0 %)
2 (20,0 %)
1 (10,0 %)
4 (40,0 %)
1 (10,0 %)

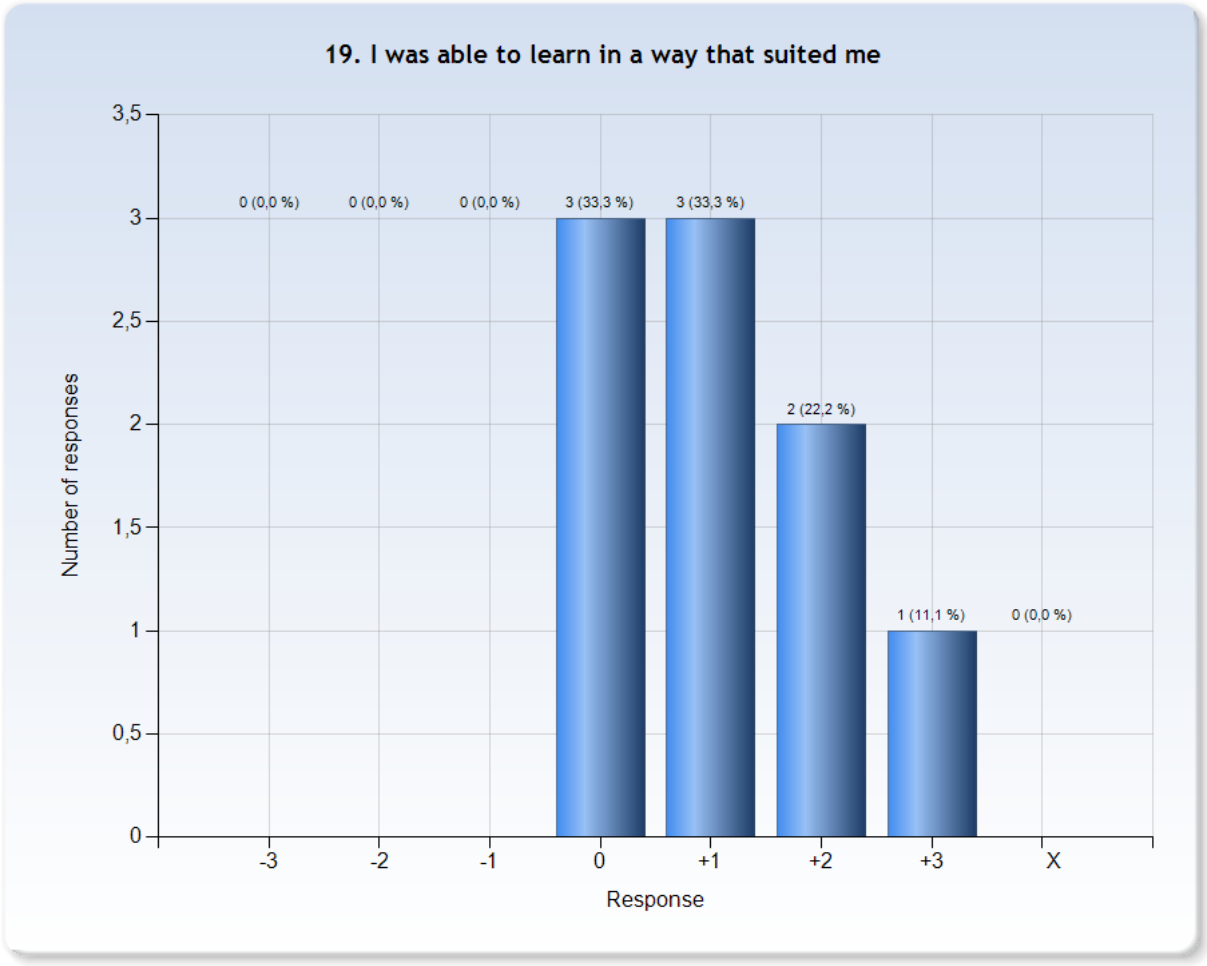
**Comments**


17. My background knowledge was sufficient to follow the course
Number of responses
Response
0
1
2
3
4
5
6
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
1 (10,0 %)
0 (0,0 %)
1 (10,0 %)
5 (50,0 %)
3 (30,0 %)
0 (0,0 %)

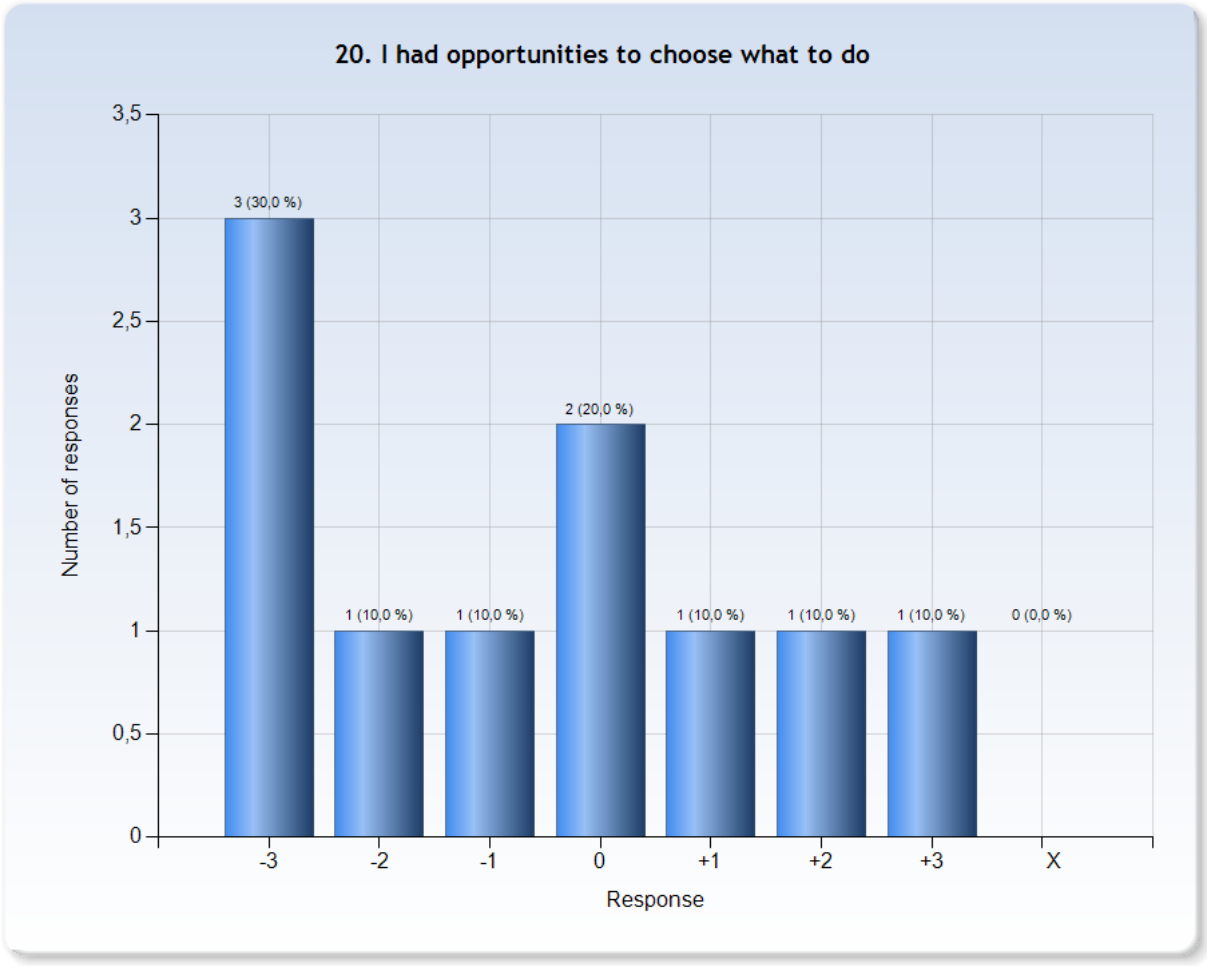
**Comments**


18. I regularly spent time to reflect on what I learned
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
2 (20,0 %)
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
3 (30,0 %)
4 (40,0 %)
1 (10,0 %)
0 (0,0 %)

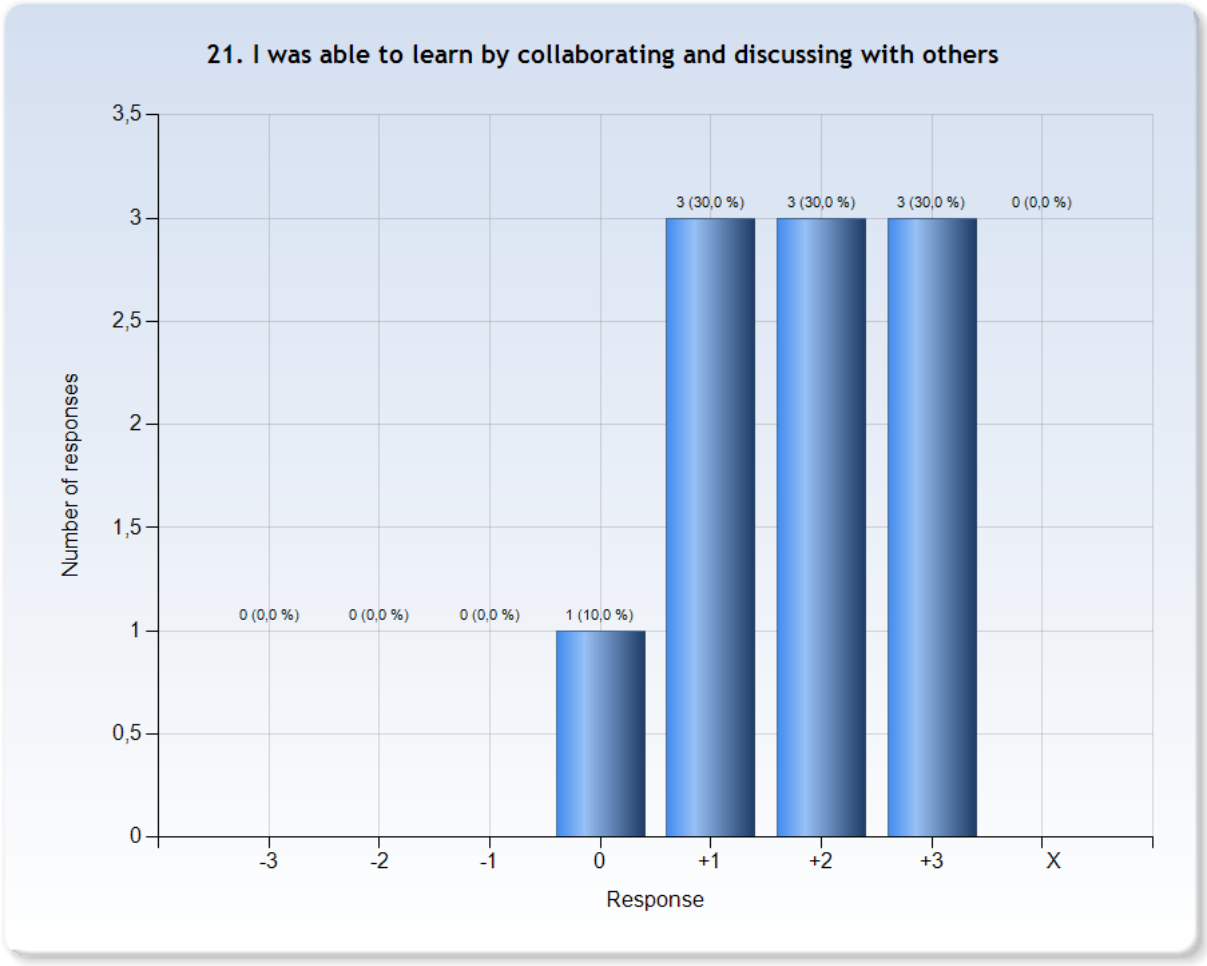
**Comments**


19. I was able to learn in a way that suited me
3,5
3
2,5
2
1,5
1
0,5
0
Number of responses
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
3 (33,3 %)
3 (33,3 %)
2 (22,2 %)
1 (11,1 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

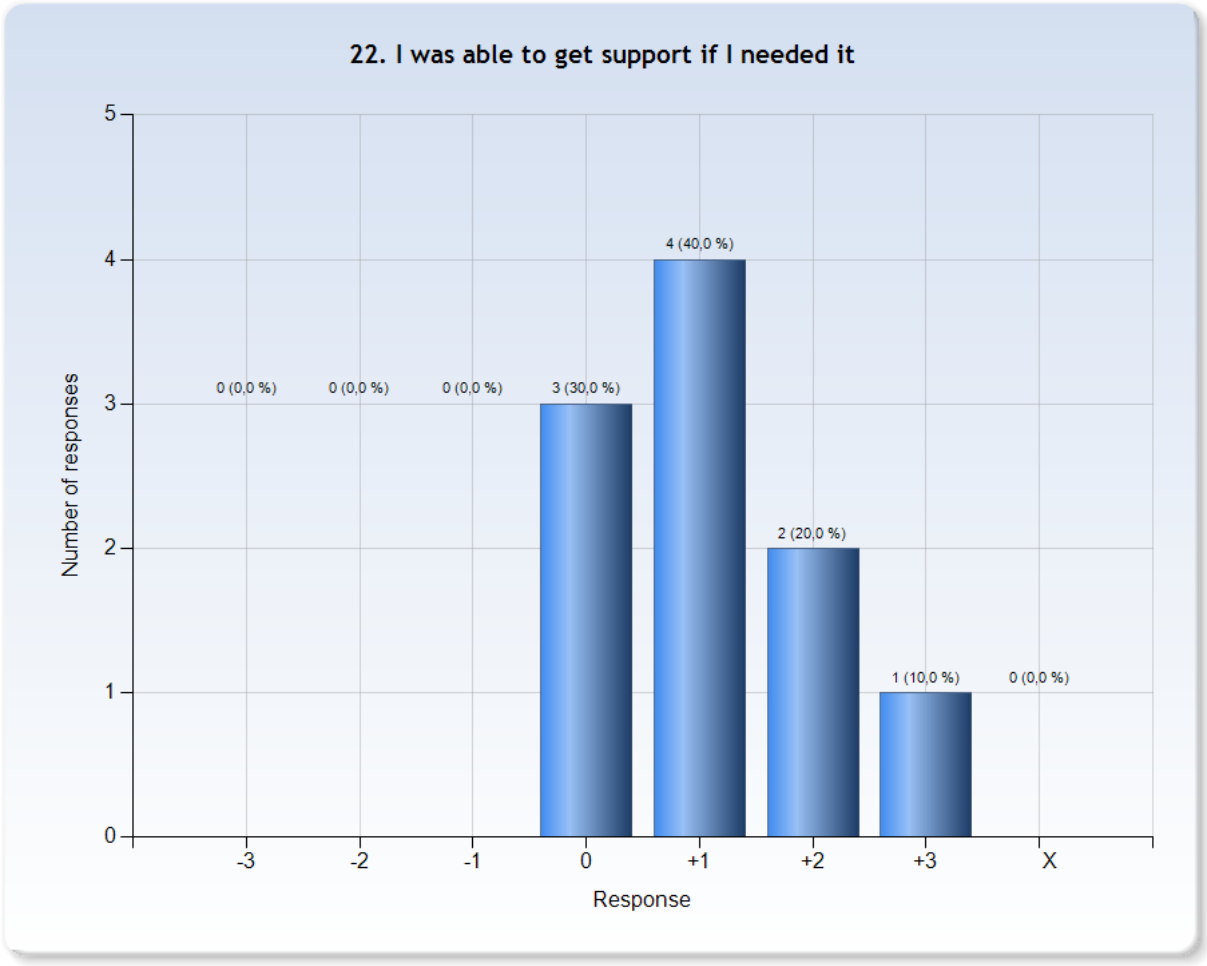
**Comments**


20. I had opportunities to choose what to do
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
3 (30,0 %)
1 (10,0 %)
1 (10,0 %)
2 (20,0 %)
1 (10,0 %)
1 (10,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**


21. I was able to learn by collaborating and discussing with others
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
1 (10,0 %)
3 (30,0 %)
3 (30,0 %)
3 (30,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

**Comments**


22. I was able to get support if I needed it
Number of responses
Response
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
3 (30,0 %)
4 (40,0 %)
2 (20,0 %)
1 (10,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

**Comments**