DD1388 VT22 Course Analysis
Program System Construction Using C++ 7,5hp
67 students (received credits)

DD1388 focusses on program design with C++, including good programming style, procedure at object-oriented development in C++, support for modularisation, memory handling, making the program code more efficient, common errors and traps, static and dynamic linking, namespace management, portability and more.
Students must pass an exam (Canvas quizzes, P/F) and their final grade is then determined through their performance on 9 lab assignments (A-F, each lab P/F).

Summary of course changes
Online face-to-face group Zoom grading sessions created for some lab assignments on the course. Use of KTH Calendar to ensure the process remains flexible for both TAs and students.
Course assessment reduced by two labs to address workload issues reported by both students and TAs.
Course assessment further restructured/clarified in line with student feedback.
Grading criteria improved for labs to improve mapping to ILOs: passing labs 1-6 now yields a 'D' grade, passing labs 1-7 a 'C' grade and so on. 'E' grade will be reserved for other cases.

Overview

Aspect	Feedback and action
Flexible deadlines, fun labs, many nice/helpful assistants, good Canvas page	We thank you for this great feedback and are very happy that you enjoyed the course!
Still issues with lab 4, takes more time than all the other labs combined, make the labs easier as they are extremely difficult for a "basic" course, set lower requirements to pass the course, fewer labs or some that are slightly smaller	We have been aware of issues with lab 4 since last year and will continue to iterate both on the clarity of the instructions, scope of the lab and how to position that lab in the grading structure of the course. In relation to reducing pass requirements, we started this process last year and will continue to tune the labs with respect to grades in order to achieve a better distribution of grades in the course to try to make 'A' grade more accessible and interesting to as many as possible (see next point).
Great lecturer, too few lectures	We are investigating ways in which further lecture could be added to course, especially nearer the end of the course and in relation to advanced topics. New course members in areas such as C++ programming for GPUs, computer graphics, games and robotics have been approached. Ideally we would like to integrate these to replace with the final, 'A' grade lab assignment in the course. Stay tuned for more details.
It is much better to run the course with a lab partner as other courses do as you learn so much more to discuss with others; Loved that it was ok to discuss tasks together as long as you wrote and understood your own code	We agree, although much of the existing course content has been created around individual work. The Zoom grading which already takes place with groups of three seems to lend itself naturally to group work. We will investigate how we can extend at least some of the labs to involve collaboration e.g. enable pair programming. You are still very welcome (and encouraged of course)

	to collaborate, albeit in a bottom-up manner for now.

Details

This course has a strong foundation in terms of basic content i.e. lab assignments and lectures that students find interesting, accessible, fun and educational. However, structural and operational issues, especially availability of a stable TA pool, has effected the robustness of the course given the number of students that take it and number of programming assignments. This year, we reduced the number of programming assignments, although there have still been comments about the difficult of the course and scope of some specific labs.

Again this year, many students reported finding the course interesting, stimulating and focussed in terms of key concepts. Also, the LEQ points 15 (formative feedback: 4.0/7.0) and 21 (collaboration opportunities: 3.9/7.0) improved on last year, even though they are still in need of further improvement. A likely reason for this has been the introduction of face-to-face Zoom sessions for many of the grading assignments. In these sessions, a single TA posts multiple grading slots on KTH Calendar. Up to three students may then sign up to each slot and they are then assessed together, in the same session. Zoom assessment has been introduced both due to the pandemic but also to allow flexibility for grading for both students and TAs – recalling that the issue of recruiting a stable pool of TAs for this course has and remains a major challenge.

There have still been challenges in quickly grading the Canvas submitted assignments in order to get feedback to students quickly. It should be noted that since, in this course students are able to resubmit any labs that are not correct, the concept of formative assessment seems equivalent to fast grading turn-around for many students. However, we also schedule a substantial number of help sessions in which students are welcome to receive feedback from TAs about their work without being graded and these appear to be underutilised by students. We will attempt to communicate how these sessions can be used for formative purposes in a clearer way to the students.

As last year, Issue 21 arises inherently from the assessment design, which is focussed on individual work and does not (yet) enable groupwork. While Covid did not help this situation, especially last year, the face-to-face Zoom grading sessions have worked remarkably well and appear popular with both TAs and students. One advantage of these sessions is that students are able to show code running on their own computers rather than laboratory computers. We are currently investigating ways to start to integrate more groupwork and collaboration possibilities into the course, but these must take into account TA considerations. However, the current use of Zoom for grading would work well in principle with lab groups.

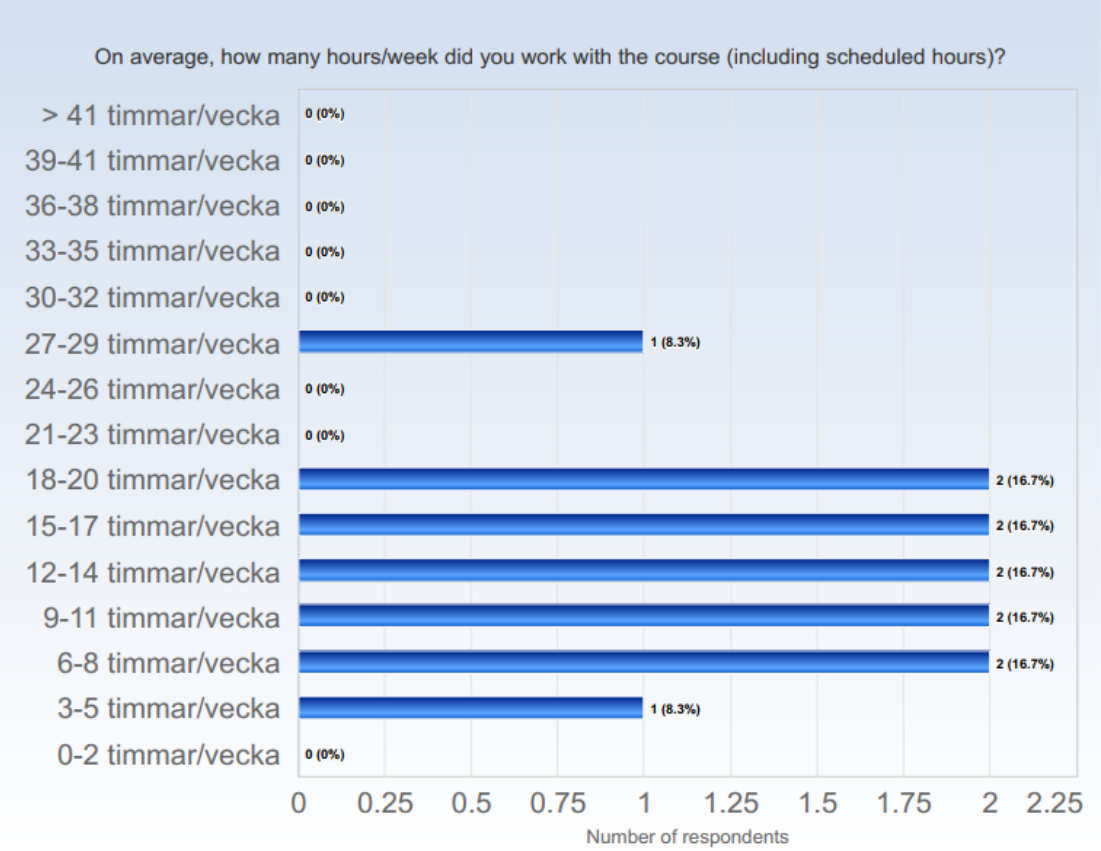
Overall, in this second round of course redesign, the course appears to have moved out of the critical phase it experienced in the last few years. Some major changes appear to have worked well and now it is a matter of tuning what is there to improve student experience in the course. This relates to continuing to evaluate the difficulty of the assessments versus grade awards, groupwork possibilities, formative opportunities, as well as a focus on the low level of female participation in the course.

LEQ Course evaluation data follows:

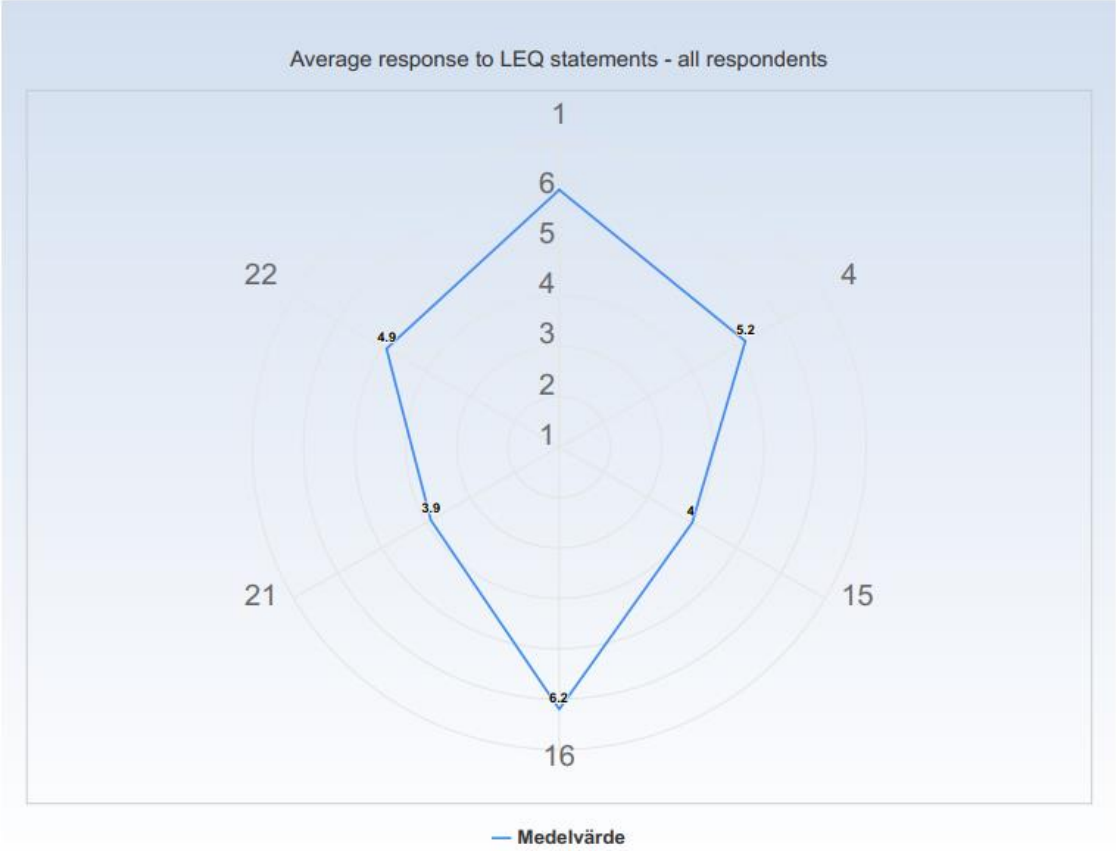
DD1388 - 2022-06-22

Antal respondenter: 123
Antal svar: 12
Svarsfrekvens: 9,76 %

ESTIMATED WORKLOAD



Note! A group has to include at least 3 respondents in order to appear in a diagram.



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

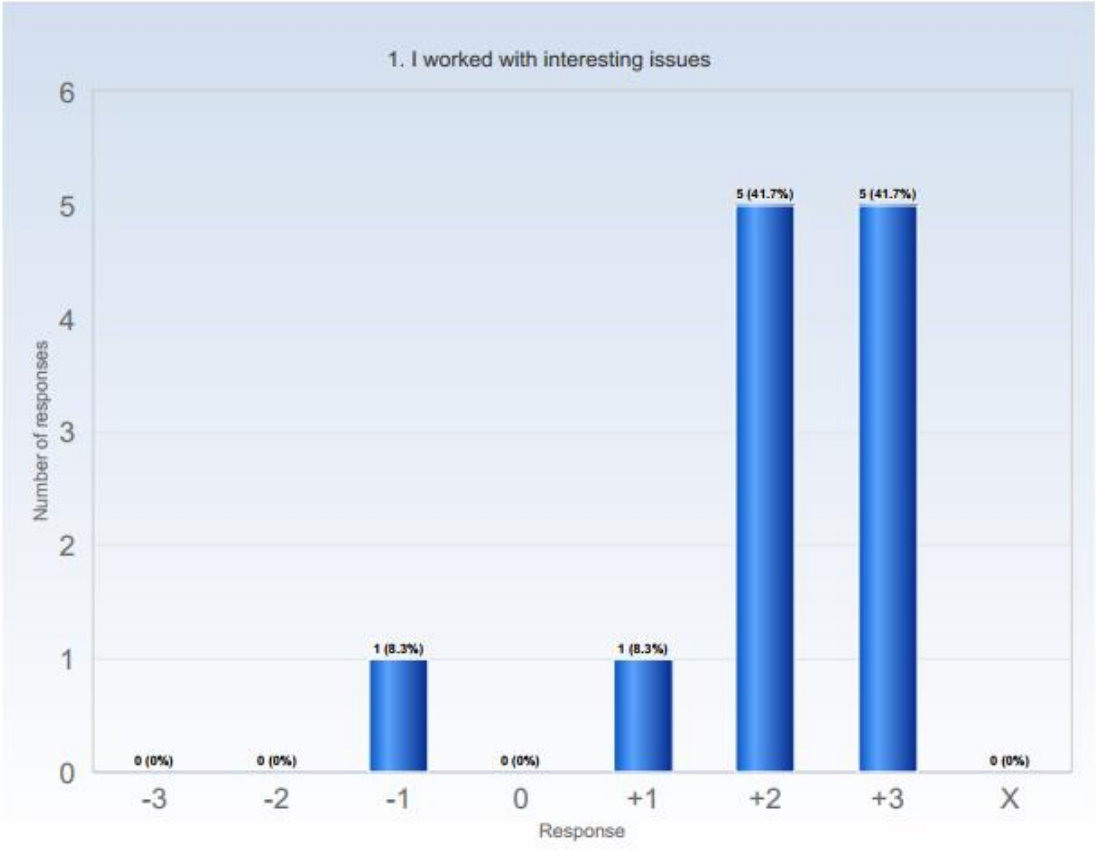
n) We are able to collaborate with other learners struggling with the same problems

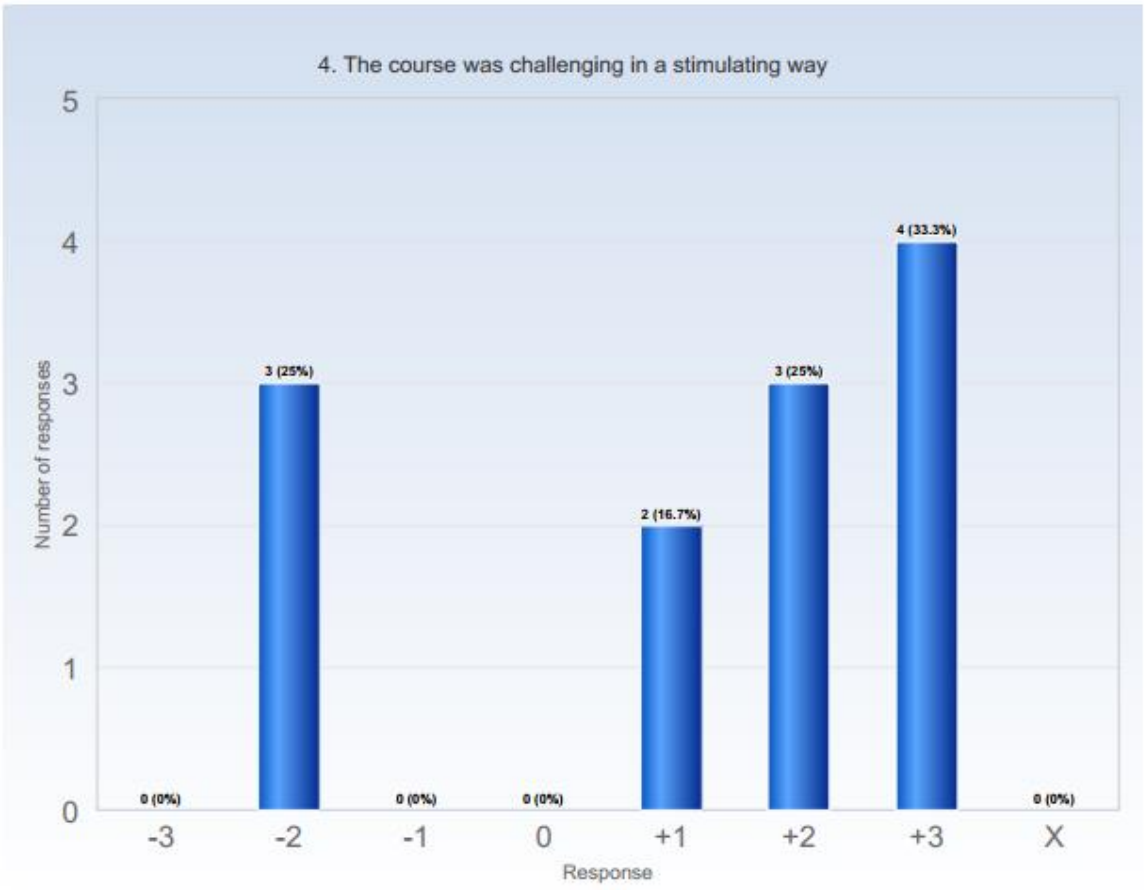
RESPONSE DATA

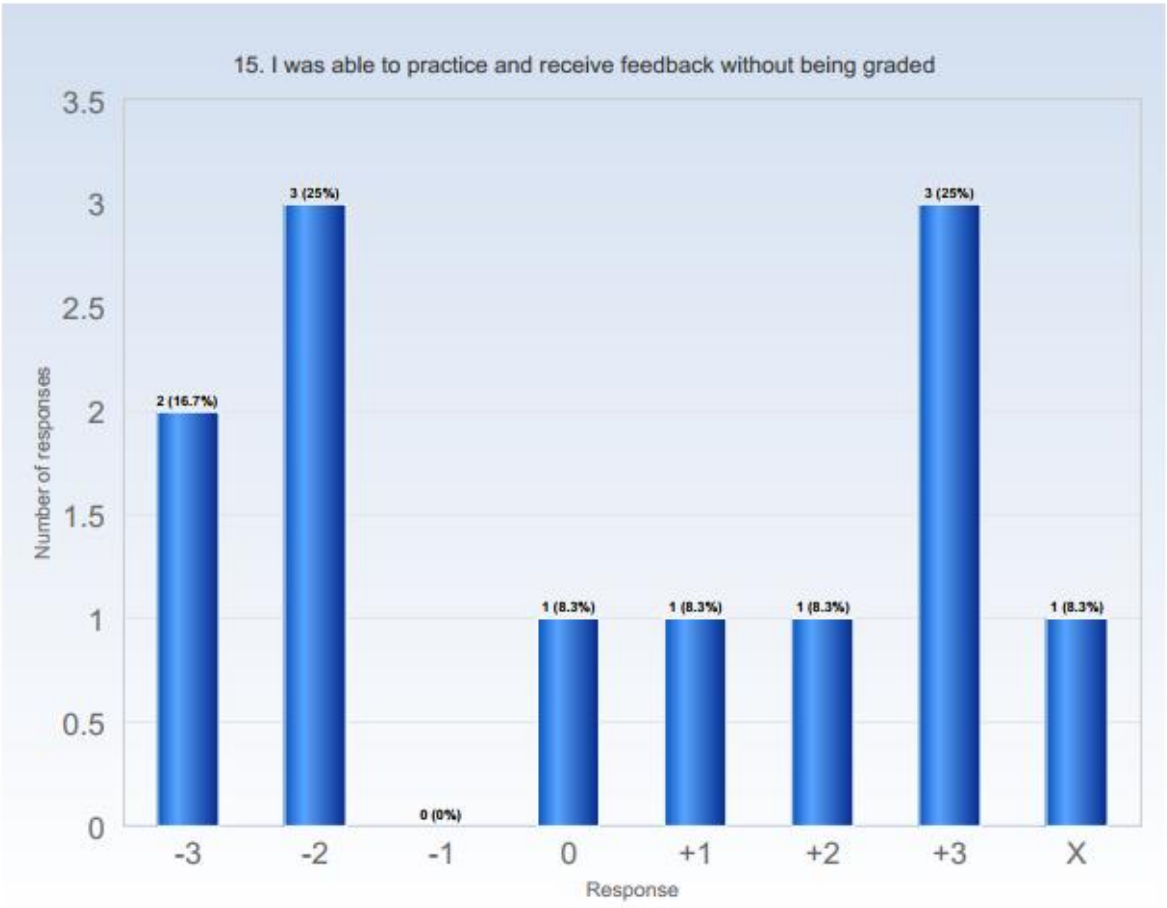
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

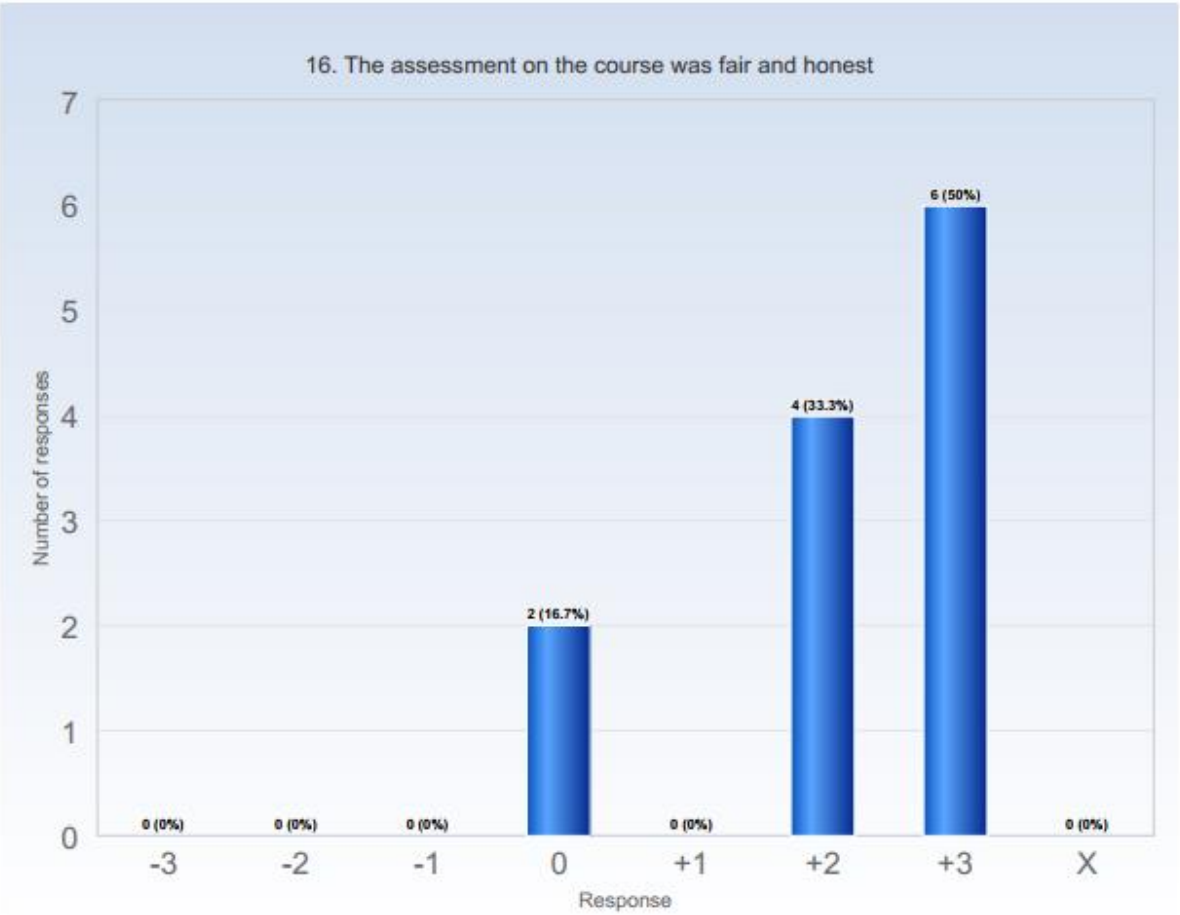
-3 = No, I strongly disagree with the statement
0 = I am neutral to the statement
+3 = Yes, I strongly agree with the statement

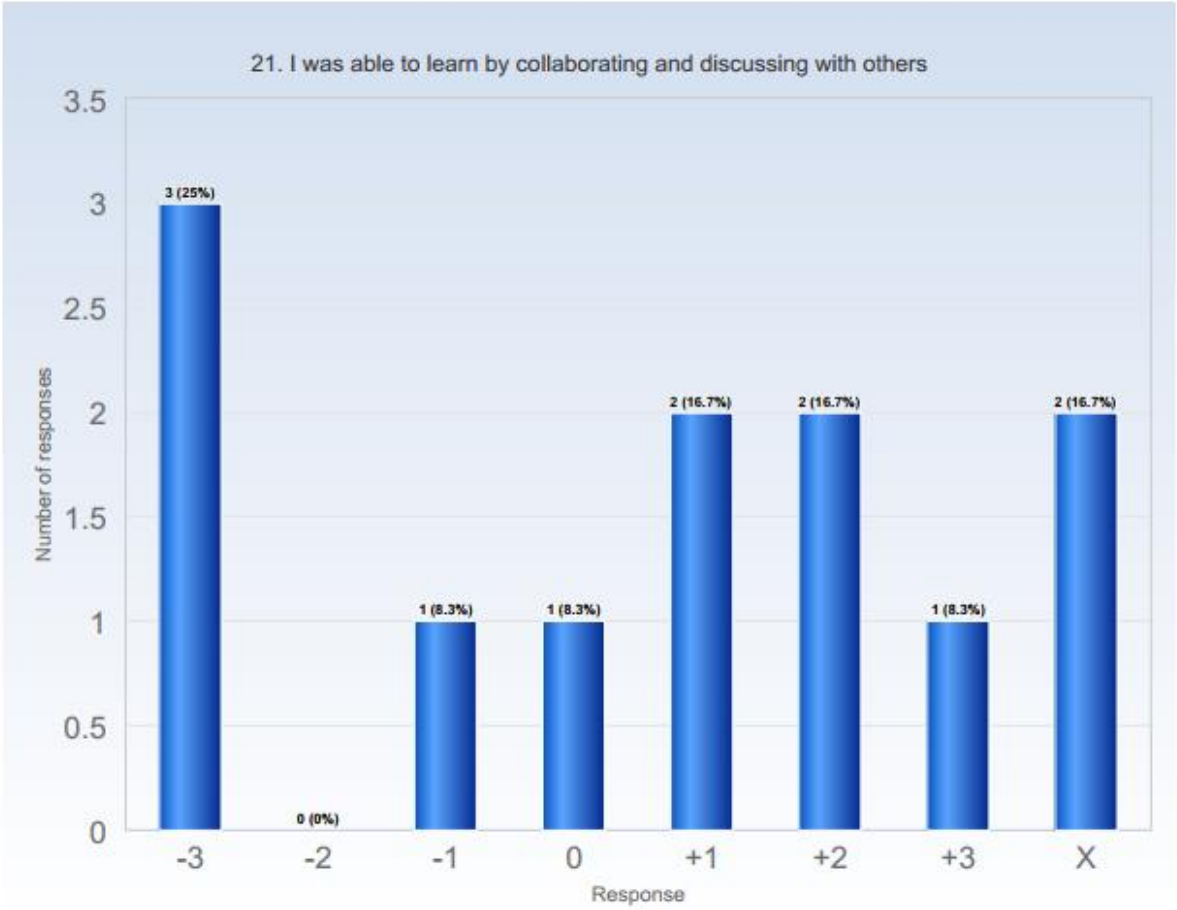
X = I decline to take a position on the statement

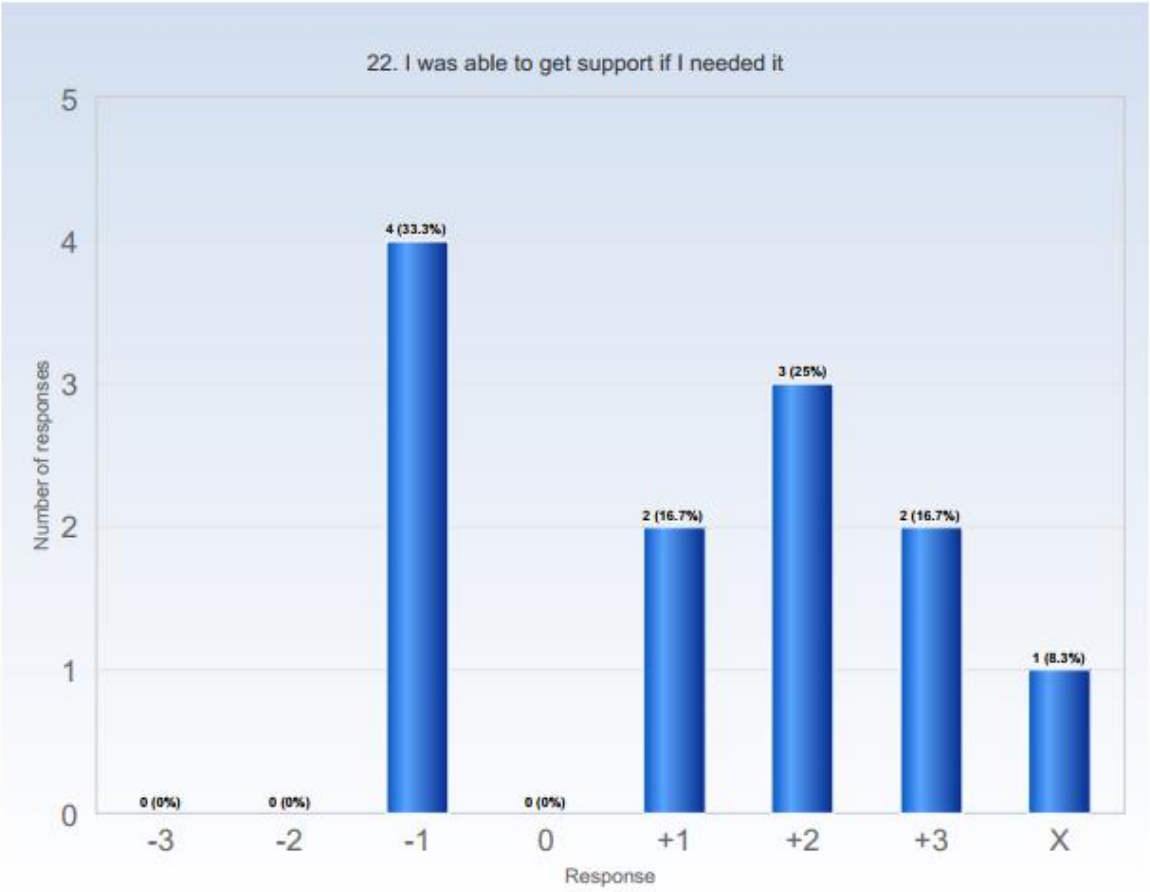



4. The course was challenging in a stimulating way
Number of responses
0
1
2
3
4
5
0 (0%)
3 (25%)
0 (0%)
0 (0%)
2 (16.7%)
3 (25%)
4 (33.3%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response


15. I was able to practice and receive feedback without being graded
Number of responses
3.5
3
2.5
2
1.5
1
0.5
0
2 (16.7%)
3 (25%)
0 (0%)
1 (8.3%)
1 (8.3%)
1 (8.3%)
3 (25%)
1 (8.3%)
-3
-2
-1
0
+1
+2
+3
X
Response


16. The assessment on the course was fair and honest
Number of responses
7
6
5
4
3
2
1
0
0 (0%)
0 (0%)
0 (0%)
2 (16.7%)
0 (0%)
4 (33.3%)
6 (50%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response


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
3 (25%)
0 (0%)
1 (8.3%)
1 (8.3%)
2 (16.7%)
2 (16.7%)
1 (8.3%)
2 (16.7%)
-3
-2
-1
0
+1
+2
+3
X
Response


22. I was able to get support if I needed it
Number of responses
5
4
3
2
1
0
4 (33.3%)
3 (25%)
2 (16.7%)
2 (16.7%)
1 (8.3%)
0 (0%)
0 (0%)
0 (0%)
-3
-2
-1
0
+1
+2
+3
X
Response