



UMEÅ UNIVERSITY

Final report: 5KE170-HT23: Biochemistry: protein structure and function

Course Code: 5KE170

Responsible Department: Department of Chemistry

Grading System: Three-grade scale

Level of Education: Second cycle

Credits: 15 hp

Pace: 100%

Semester: Autumn 2023 (31/10/2023-12/01/2023)

Course coordinator: André Mateus

Delivery (campus/online-remote): Campus

Number of registered students: 17

Number of students that participated in the first exam: 15

Final grade after first exam:

Fail (U) = 2 (13%)

Pass (G) = 6 (40%)

Pass with distinction (VG) = 7 (47%)

Number of students that participated in the course valuation: 12 (71%)

Course valuation

See appendix. Written comments from the students were removed from the appendix, but general comments are summarized below.

Comments by course coordinator:

This was the second time that the course had a new coordinator.

In relation to last year, there were a few modifications to the course:

- A new syllabus was written, with clear expected learning outcomes.
- A new lab was introduced in which students performed particle reconstruction from cryoEM data.
- The Molecular Graphics sessions were greatly redesigned to include clearer instructions (this was a criticism from last year).
- One of the lab moments was removed and the final project was increased in length (from 1 week to 2 weeks).
- A Q&A session before the exam was introduced.

Comments to the overall course structure were positive. The course evaluation followed the LEQ format and there was a general increase in the scores of each section. The lowest scoring sections were the sense of community and the feedback received (see below for specific



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comments). As last year, the students appreciated the different moments and the exposure to different teachers. The students were generally happy with the molecular graphics sessions.

Here are some suggestions for improvement:

- The overall pace of the course was considered low and the students feel like they can take on more material. There were two specific suggestions:
 - Some extra voluntary reading.
 - More lectures on topics like intrinsically disordered proteins or post-translational modifications.
- The exam could be done before Christmas not too leave a too large gap between the last lectures and the exam.

Some of these aspects will be implemented in the next iteration of the course.

The general suggestion for future students is to review each lecture every day and not leave everything to just before the exam.



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Course survey for Biokemi - Proteiners struktur och funktion - statistics only

Questionnaire: UPL LEQ4

Respondents: 23

Answer Count: 12

Answer Frequency: 52.17%

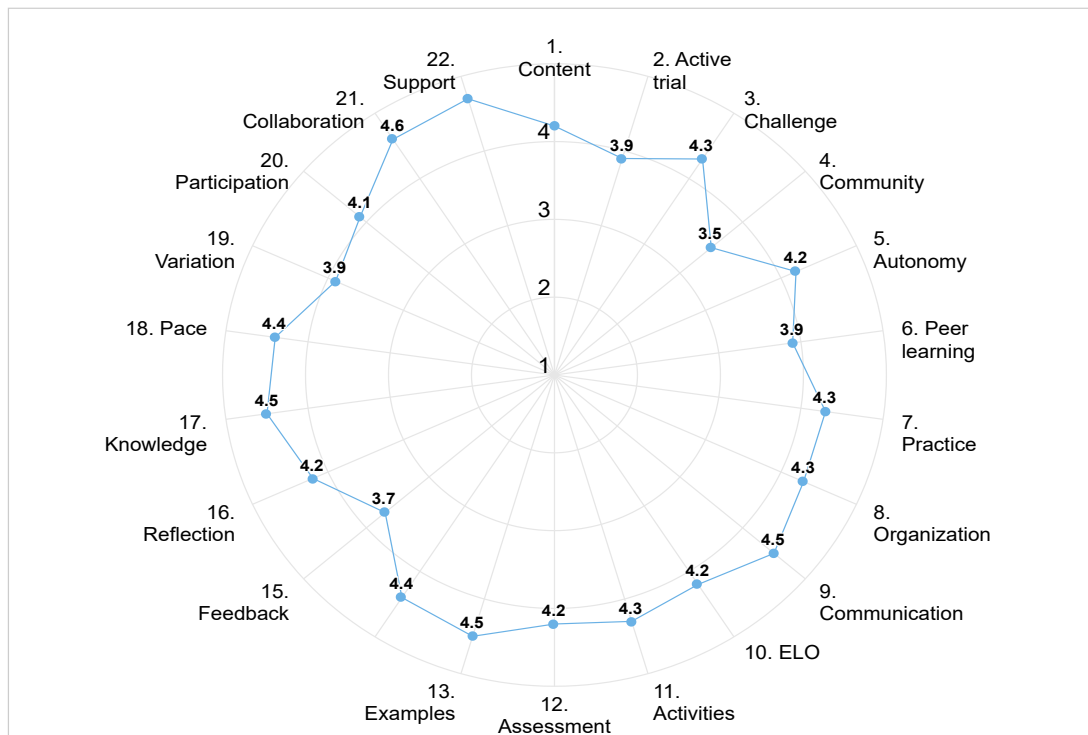
Average response to statements about the learning environment

The first 22 statements examine the student's experience of the learning environment based on a number of factors that in empirical research have been found to promote learning in higher education.

At a more general level, the student's experience of meaningfulness (statements 1-7), comprehensibility (8-16) and manageability (17-22) in the learning environment are also examined.

The polar diagram below shows the mean value of the response to each statement using a numeric scale from 1 to 5 where 1 = "Strongly disagree" and 5 = "Strongly agree".

More detailed information about these statements – and the response to them – are found below.



Assessment of own effort

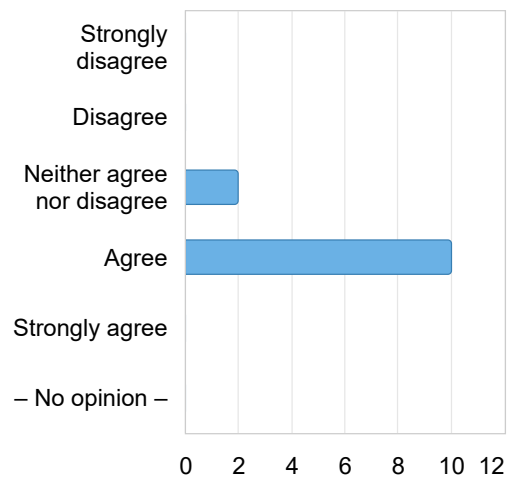
23. I studied to the extent I needed to comprehend the content of the course

General category: Own effort

Aspect of learning environment: Own effort

Learning factor: We have enough time to learn and devote the time needed to do so

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	2 (16.7%)
Agree	10 (83.3%)
Strongly agree	0 (0.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	3.8	0.4

Detailed response to statements about the learning environment

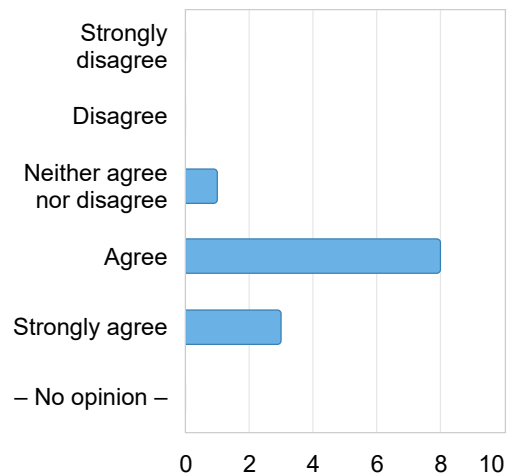
1. The course content felt meaningful to me as a person

General category: Meaningfulness

Aspect of learning environment: Meaningful content

Learning factor: We try to answer questions, solve problems or develop skills that we find interesting, exciting or important

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	8 (66.7%)
Strongly agree	3 (25.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.2	0.6

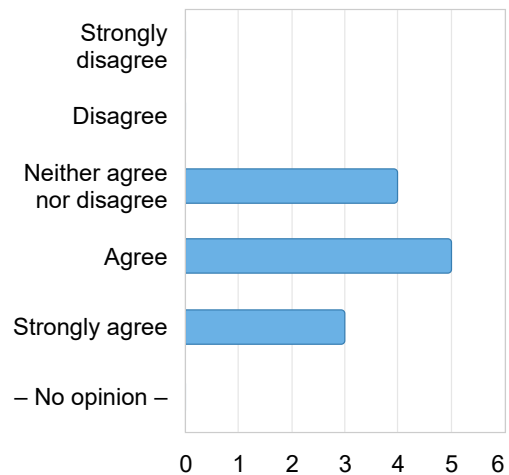
2. I was able to try out my own ideas about the subject – theoretically or practically – and learn from experience

General category: Meaningfulness

Aspect of learning environment: Active trial

Learning factor: We are able to speculate, test ideas (intellectually or practically) and learn from experience, even before we know much about the subject

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	4 (33.3%)
Agree	5 (41.7%)
Strongly agree	3 (25.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	3.9	0.8

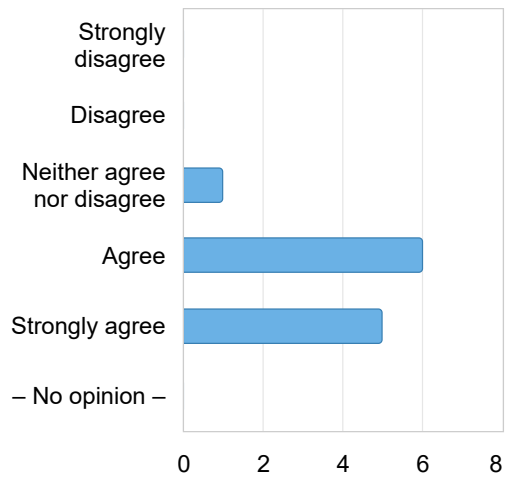
3. The course was challenging in a stimulating way

General category: Meaningfulness

Aspect of learning environment: Challenge

Learning factor: We are able speculate, test ideas... in a challenging and at the same time supportive environment

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	6 (50.0%)
Strongly agree	5 (41.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.3	0.7

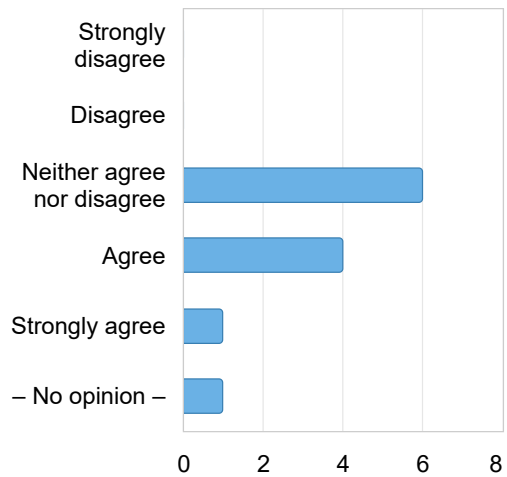
4. I felt a sense of community with others on the course

General category: Meaningfulness

Aspect of learning environment: Belonging

Learning factor: We feel that we are part of a community and believe that other people have confidence in our ability to learn

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	6 (50.0%)
Agree	4 (33.3%)
Strongly agree	1 (8.3%)
– No opinion –	1 (8.3%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	3.5	0.7

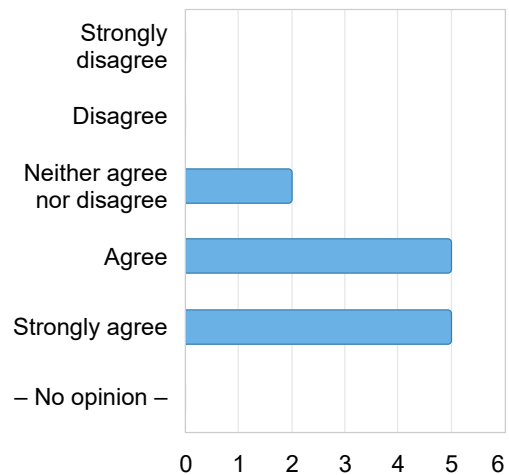
5. I felt that the teachers in the course had confidence in my ability to learn

General category: Meaningfulness

Aspect of learning environment: Autonomy

Learning factor: We feel that we are part of a community and believe that other people have confidence in our ability to learn

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	2 (16.7%)
Agree	5 (41.7%)
Strongly agree	5 (41.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.2	0.8

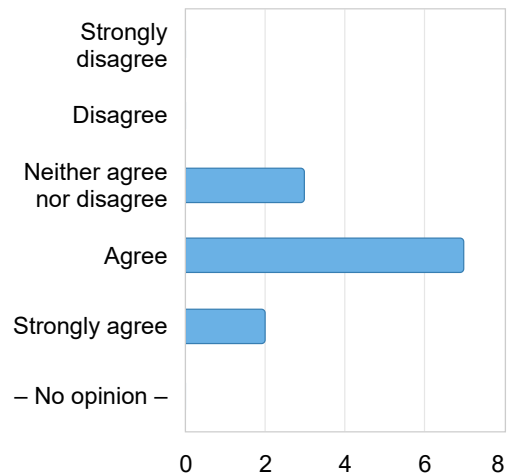
6. Collaborating with others on the course helped me to learn

General category: Meaningfulness

Aspect of learning environment: Peer learning

Learning factor: We are able to collaborate with and learn from other learners struggling with the same problems

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	3 (25.0%)
Agree	7 (58.3%)
Strongly agree	2 (16.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	3.9	0.7

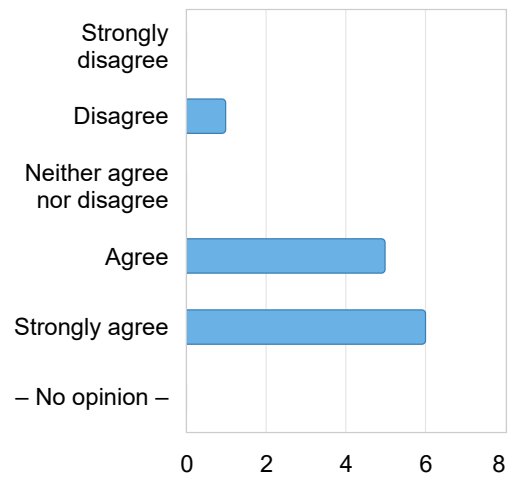
7. During the course I was given opportunities to practice what I was expected to learn

General category: Meaningfulness

Aspect of learning environment: Practice

Learning factor: We are able to try, fail, and receive feedback before, and separate from, each summative assessment of our efforts

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	1 (8.3%)
Neither agree nor disagree	0 (0.0%)
Agree	5 (41.7%)
Strongly agree	6 (50.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.3	0.9

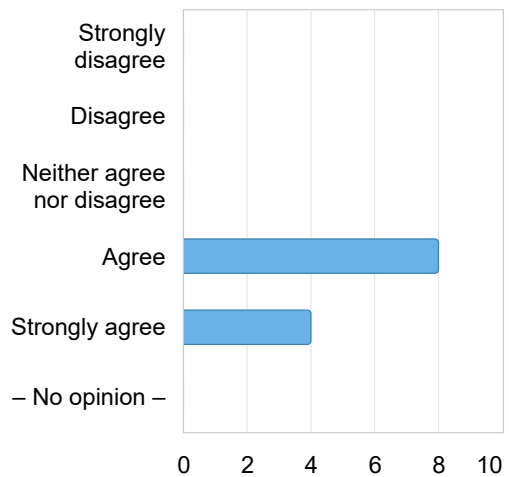
8. The course was organized in a way that helped me understand what I should do

General category: Comprehensibility

Aspect of learning environment: Clear organization

Learning factor: We understand how the environment is organized and what is expected of us

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	8 (66.7%)
Strongly agree	4 (33.3%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.3	0.5

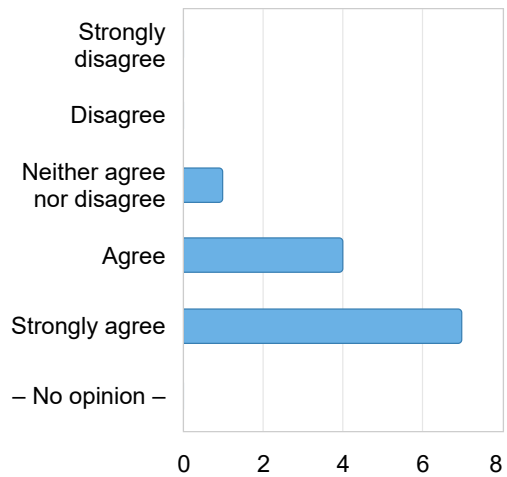
9. The course content was communicated in ways I could understand

General category: Comprehensibility

Aspect of learning environment: Clear communication

Learning factor: We have sufficient prior knowledge to handle our learning situation, which is at the same time well adapted to the intended level

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	4 (33.3%)
Strongly agree	7 (58.3%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.5	0.7

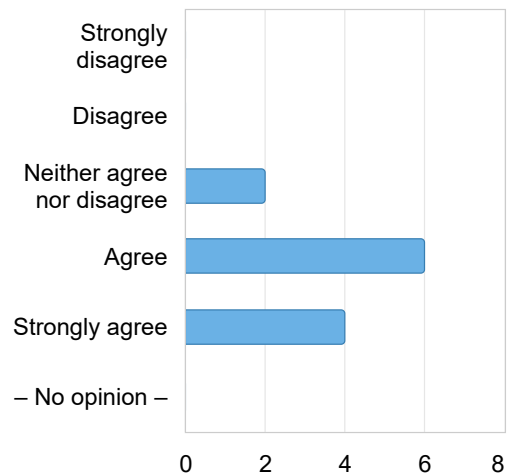
10. The expected learning outcomes of the course helped me understand what I was going to learn

General category: Comprehensibility

Aspect of learning environment: Constructive alignment

Learning factor: We understand the meaning of the expected learning outcomes and believe that the work we are expected to do will help us achieve these

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	2 (16.7%)
Agree	6 (50.0%)
Strongly agree	4 (33.3%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.2	0.7

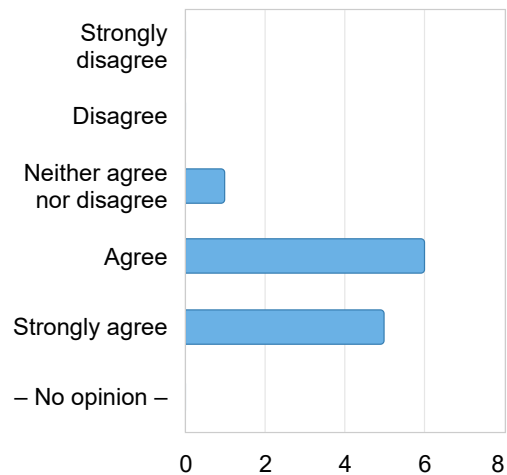
11. The course activities helped me reach the expected learning outcomes

General category: Comprehensibility

Aspect of learning environment: Constructive alignment

Learning factor: We understand the meaning of the expected learning outcomes and believe that the work we are expected to do will help us achieve these

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	6 (50.0%)
Strongly agree	5 (41.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.3	0.7

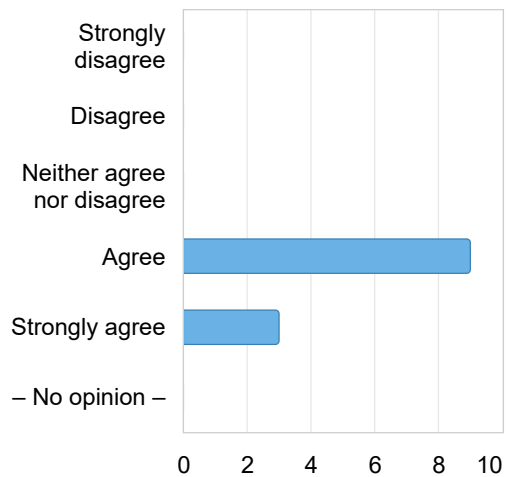
12. My knowledge and abilities were assessed in a clear and equitable way

General category: Comprehensibility

Aspect of learning environment: Constructive alignment

Learning factor: We believe that our work will be considered in a fair and honest way

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	9 (75.0%)
Strongly agree	3 (25.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.2	0.5

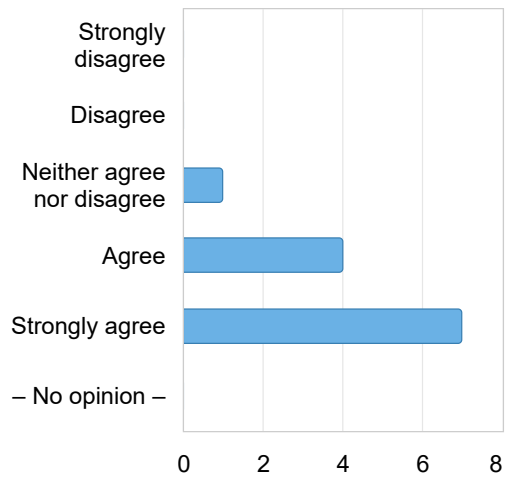
13. I was able to learn from concrete examples that I could relate to

General category: Comprehensibility

Aspect of learning environment: Concrete examples

Learning factor: We are able to learn inductively by moving from concrete examples and experiences to general principles, rather than the reverse

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	4 (33.3%)
Strongly agree	7 (58.3%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.5	0.7

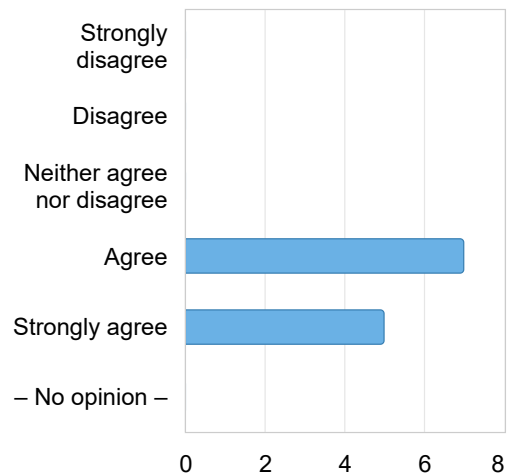
14. The course activities helped me develop a thorough understanding of key concepts

General category: Comprehensibility

Aspect of learning environment: Key concepts

Learning factor: We are challenged to develop a thorough understanding of key concepts and gradually create a coherent whole from the content

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	7 (58.3%)
Strongly agree	5 (41.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.4	0.5

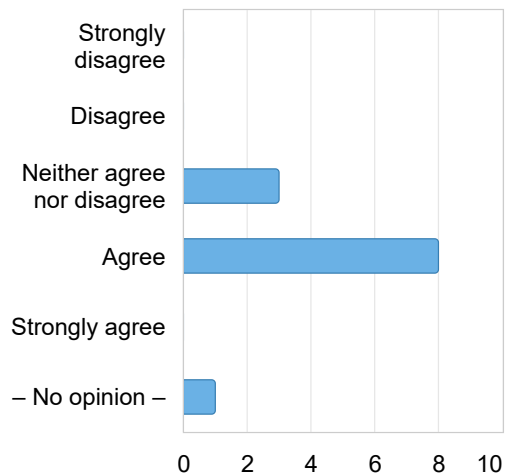
15. I received regular feedback from teachers or peers that helped me see my progress

General category: Comprehensibility

Aspect of learning environment: Feedback

Learning factor: We are able to try, fail, and receive feedback before, and separate from, each summative assessment of our efforts

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	3 (25.0%)
Agree	8 (66.7%)
Strongly agree	0 (0.0%)
– No opinion –	1 (8.3%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	3.7	0.5

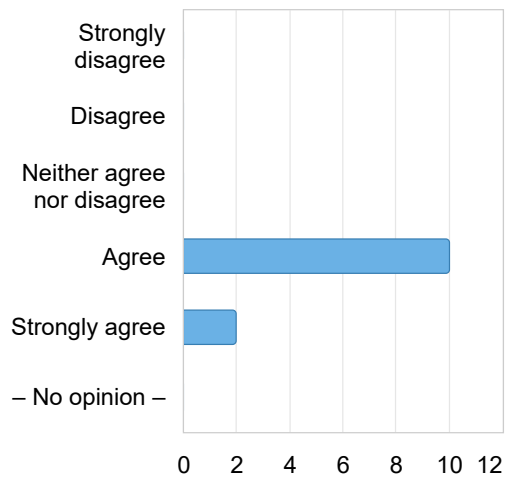
16. The course activities provided opportunities to reflect on what I learned

General category: Comprehensibility

Aspect of learning environment: Reflective observation

Learning factor: We can reflect on new experiences in the light of previous knowledge and experience

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	10 (83.3%)
Strongly agree	2 (16.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.2	0.4

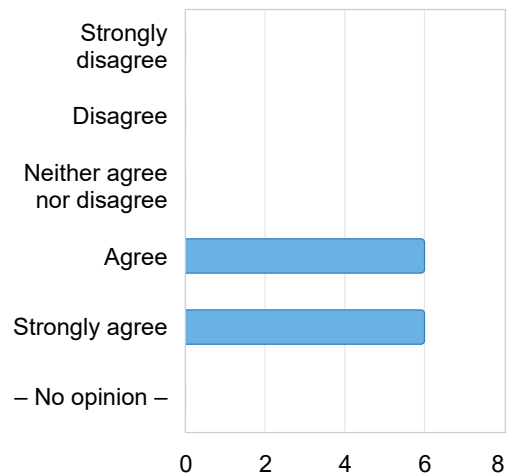
17. My background knowledge and abilities were sufficient to follow the course

General category: Manageability

Aspect of learning environment: Sufficient prior knowledge

Learning factor: We have sufficient prior knowledge to handle our learning situation, which is at the same time well adapted to the intended level

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	6 (50.0%)
Strongly agree	6 (50.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.5	0.5

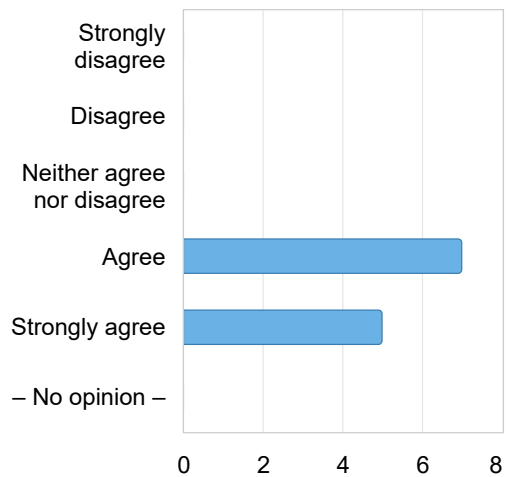
18. The pace of the course was reasonable in relation to what I was expected to do

General category: Manageability

Aspect of learning environment: Enough time

Learning factor: We have enough time to learn and devote the time needed to do so

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	7 (58.3%)
Strongly agree	5 (41.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.4	0.5

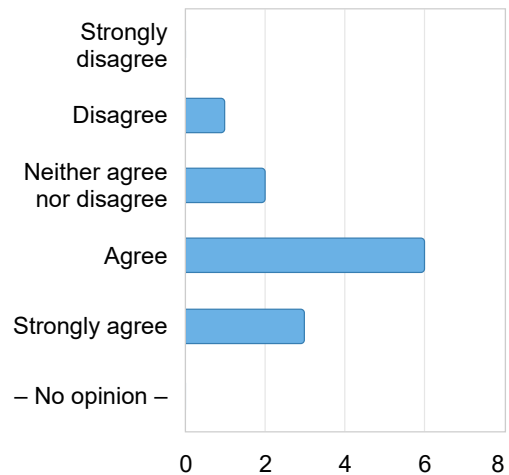
19. The course activities enabled me to learn in different ways

General category: Manageability

Aspect of learning environment: Variation

Learning factor: We are able to learn in different ways and have opportunities to influence our learning situation

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	1 (8.3%)
Neither agree nor disagree	2 (16.7%)
Agree	6 (50.0%)
Strongly agree	3 (25.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



	Mean	Standard Deviation
Statistics	3.9	0.9

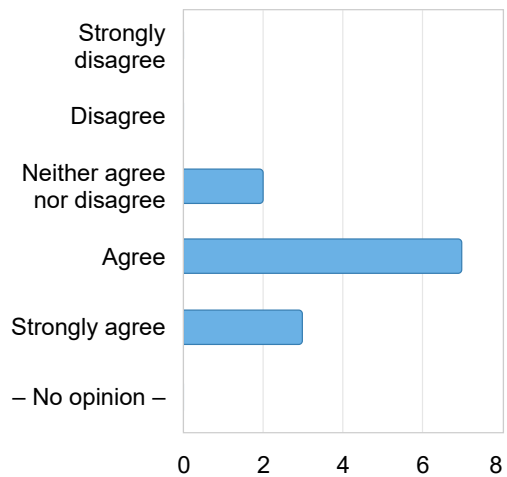
20. I felt that the teachers were interested in and took into account my experiences of the course

General category: Manageability

Aspect of learning environment: Participation

Learning factor: We are able to learn in different ways and have opportunities to influence our learning situation

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	2 (16.7%)
Agree	7 (58.3%)
Strongly agree	3 (25.0%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.1	0.7

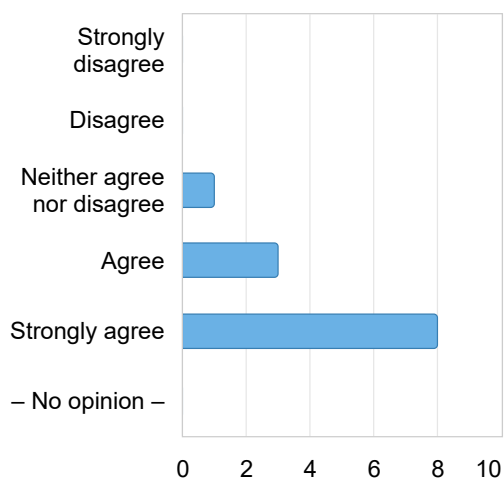
21. The course activities provided opportunities to collaborate with others and discuss the subject

General category: Manageability

Aspect of learning environment: Collaboration

Learning factor: We are able to collaborate with and learn from other learners struggling with the same problems

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	1 (8.3%)
Agree	3 (25.0%)
Strongly agree	8 (66.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.6	0.7

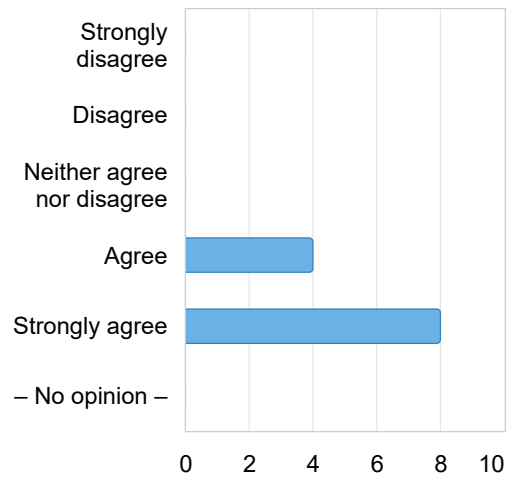
22. I was able to get support from teachers or peers if I needed it

General category: Manageability

Aspect of learning environment: Support

Learning factor: We are able to speculate, test ideas... in a challenging and at the same time supportive environment

Answer option	Number of responses
Strongly disagree	0 (0.0%)
Disagree	0 (0.0%)
Neither agree nor disagree	0 (0.0%)
Agree	4 (33.3%)
Strongly agree	8 (66.7%)
– No opinion –	0 (0.0%)
Total	12 (100.0%)



Statistics	Mean	Standard Deviation
	4.7	0.5