

Analysis of Circular Manufacturing Systems (code MG2043, 6 ECTS)
HT23

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1. Description of the course evaluation process:

This course evaluation is conducted based on the input received from the students through course evaluation surveys and based on the experiences of the course responsible/teacher gathered during running the course.

2. Description of meetings with students

No meeting with students on course evaluation surveys was conducted in HT23. However, a meeting with a group of exchange students was held as part of last year's development plan. See further details on this in section 10.

3. Course design

This is a 6 ECTS course designed to introduce the fundamentals of circular economy as well as the concept of circular manufacturing systems (CMS) and the framework for its implementation. This is a project-based course where students implement the knowledge to complete the project. Through the project, the course also stimulates the students to work with practical problems that will contribute to sustainable development as well as encourages them to bring forward solutions that have entrepreneurial value. The project work is equivalent to 4 ECTS and determines the grade in the course.

There is a quiz on the reading materials equivalent to 1.5 ECTS to ensure that the students have gone through the important literature on the topic.

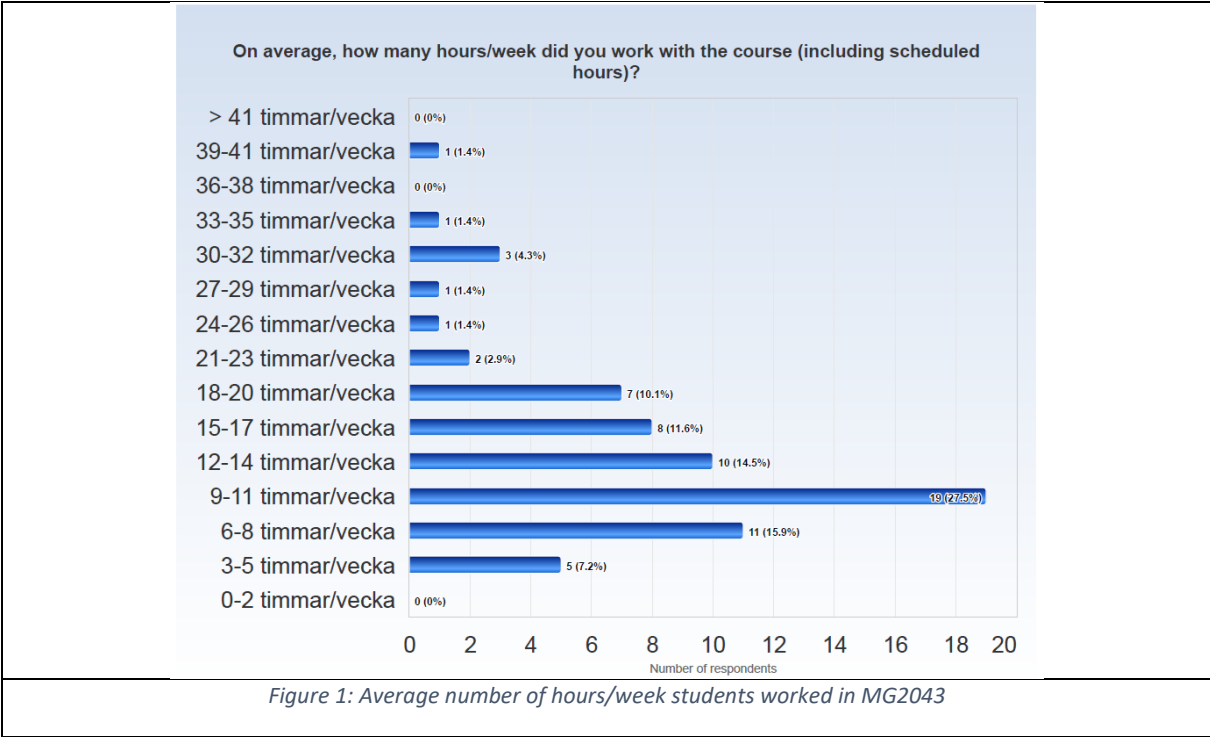
Most of the lectures in the course are followed by a seminar for deep-diving into the topic and allow students to apply the theory (from the lectures) in their project work in addition to the final seminar. To stimulate discussion and engagement, active participation in the seminars gives 0.5 ECTS.

The project groups are invited to at least 2 supervision sessions to discuss the project and progress with the possibility of booking as many sessions as they need.

4. Students' workload

As Figure 1 shows, the majority of the students, i.e. about 42 % of the students spent 9 to 14 hours every week in the course corresponding to 72- 112 hours against the expected 160 hours (a 6 ECTS course, spread over 8 weeks). About 7 % of the students spent less than 5 hours every week corresponding to less than 40 hours. About 22% of the students spent up to 15-23 hours every week corresponding to about 120-184 hours in total. About 10% of the students put more than 184 hours in the course in total. This time variation is due to the fact that the course is based on project work where students decide the level of ambition and effort, they want to put in the project work. This reflects rather proportionally on the grade as shown in Figure 2. It could be concluded that the student group that spent more time received a grade 'A' whereas the student groups that spent moderate to low time received grades 'B', 'C' 'D' and 'E'.

It is to be noted that, in comparison to the last two years, on average the students this year have put more effort into the course and about 12% of students have taken more workload than the corresponding credit. **If this becomes a trend in the coming years the workload may need to be adjusted.**



5. Results of the course

The grade distributions of the course in HT 23 are shown below. 60% of the students received grades 'A' and 'B', which may be perceived as relatively high. Since this is a project-based course (where the grade is based on project work, report, and the final presentation), the students get formative feedback during the process and can improve their work continuously before the final grade is decided. Thus, the high ratio of grades 'A' and 'B' is justified. The ratio of students that received the grade 'C' and below is relatively higher in comparison to the results of the previous years. **If this becomes a trend in the coming years further investigation will be needed to identify the cause.**

Grade	Count	%
A	25	31%
B	24	29%
C	26	32%
D	1	1%
E	4	5%
F	2	2%
	82	100%

Figure 2: Results of MG2043 in HT23

6. Students' answers to open questions

Since the course had a large number of participants the number of comments left by the students was rather large. Some of the comments are redundant and repeating. Some of the relevant and constructive comments are listed below by categorizing them as positive and critical comments.

Positive comments:

"That the course was very innovative and modern"

"Creating a startup idea and creating a company out of it"

"The lectures really explain in depth the Circular Manufacturing principles and the key points that we need to pay attention to."

"we had the opportunity to create something on our own which helps us understand the issues that might arise and also provide solutions to it."

"The opportunity of working with people from all over the world and see other ways of working and face the project."

"We are working in teams and that is a very good example of our future job. Challenging though"

"The CMS Project helped us with teamwork and implementation of the fundamentals in a real life scenario. The classes were precise and the helpful. The reading material provided was curated nicely and helped us with the quiz."

"It is to be appreciated on how the latest research in the field of CMS has been incorporated in the lectures rather than content from a text book just like in any other course. - The best aspect of the course was the seminars which were coupled and conducted with/after a lecture, this gave a sense of practicality in the way of teaching and enabled a push towards implementation of key concepts of circularity into the project which otherwise would have taken much more time than just 2 hours."

"To have the opportunity to practice and have better understandings of theoretical knowledge with project."

"Interesting to be able to choose your own project, since it will be something you are actually interested in."

"Lectures demonstrated the concept with practical examples"

"Very hands-on approach, lots of learning to be done in individual/group research."

Critical comments:

"A lot of reading for the quiz of papers that were in many cases repeating the same material, some could be said about the lessons, every lesson added something new but also repeated a lot."

"It felt that content was sometimes a bit repetitive."

"I did not like that the final presentation took a whole day as I did not find it useful or learned from listening to others. It took too long and it is draining. It did not further my understanding on the CMS subject."

"I would suggest an improvement in the instructions for the quiz. It was very unclear what we had to know for the quiz. Maybe more specific and present what we need to understand before the quiz."

"Better guidance on what exactly we need to do and what needs to be in the final report."

"The timing of the lectures could be planned to be after 10am. It was hard to wake up and attend the classes at 8. The projects can be graded on different criteria such as Best Project Idea, Best Project Presentation, etc instead of just the one "Best Project"."

".....Trim down the papers a bit, there was a bunch of overlap between different papers."

"I would suggest to give students extra time even during lessons for team alignments in order to work for the project"

".....The "quizz" was terrible. You cannot hold an examination in a lecture hall where people are sittning next to eachother. You cannot have different questions for everyone since the questions had varying difficulties...."

"The case studies explained during the lectures. The examples tend to get monotonous and the lectures can be a bit more detail oriented and in depth instead of just the basic details and the ideas."

"... Also it could be interesting to hear other models ofCE other than the one developed in KTH, just to have more of a sense of the global studies on the subject."

7. Summary of students' opinions

As seen in the comments above, the course got both positive remarks and some critical remarks. The relevant critical remarks are neither unusual for a course of this size nor difficult to address in the next round of the course.

8. Overall impression:

The polar diagram in Figure 3 below shows the average response to the LEQ statements for all of the 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

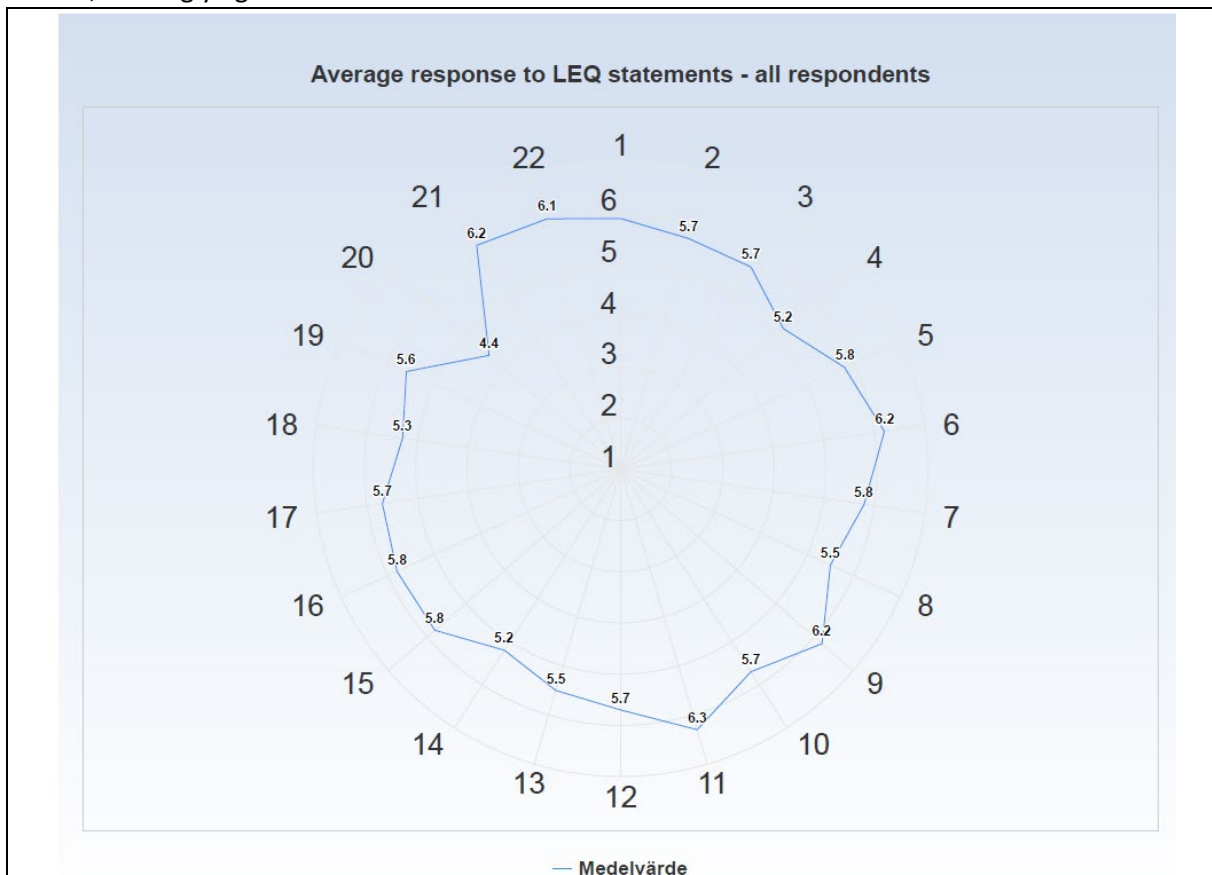
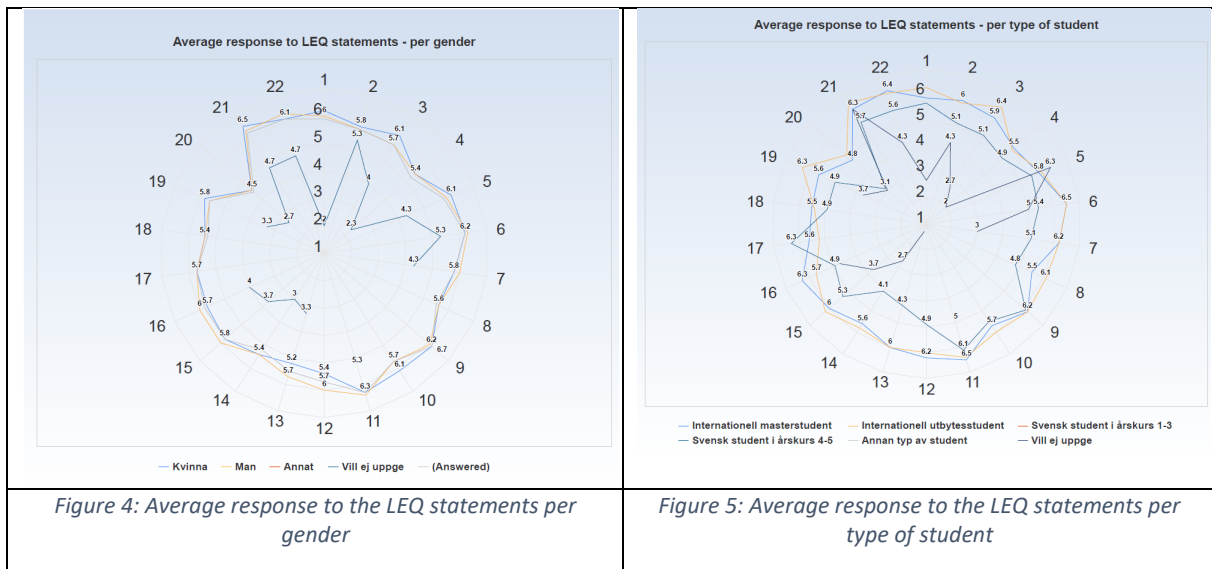


Figure 3: Average response to the LEQ statements for all of the respondents

The average score to LEQ statements in the polar diagram below 6 is considered as the potential area of improvement and below 5.6 is considered critical. Unlike previous years, there is a minor variation in response to the LEQ statements from the perspectives of gender as shown in figure Figure 4. However, there is a major variation in response to the LEQ statements from the perspectives of the type of students as shown in Figure 5. As it seems, that the Swedish students are relatively more critical in their response, in comparison to other students' groups. Exchange students seem most positive in their responses. It is to be noted that in HT22 the exchange students were most critical and to investigate this further a group of exchange students were interviewed in HT23 to get a deeper understanding. In HT24 the Swedish students will be prioritized for a group interview to understand the issues better.



9. Analysis:

Based on the input from students both through the survey and the discussion and my own experience it is safe to say that most of the students perceive the course as a good course. The course contents cover important aspects of CMS and the course activities are well-aligned to meet all ILOs. LEQ statements 4, 8, 13, 14, 18, and 20 got scores between 4.4 and 5.5, which in my opinion a bit lower. These LEQ statements deal with stimulating learning, organization of the course to support learning, course design to enhance learning, expectations, and opportunities to influence the course activities respectively.

Looking into the details of the responses it is understood that about 62% of students are positive that the course stimulated learning, 83% of students found the course organization supported their learning, 81 % of the students knew what was expected from them, 73% of the students are satisfied with the feedback received and finally, response to opportunities to influence the course activities is rather mixed. This shows that although the average response to the LEQ statements is a bit lower for statements 4, 8, 13, 14, 18, and 20, most of the students have responded positively.

However, it is important to look further into why some students think the opposite. Looking through the comments (only those that seem constructive) some clues are found. For example, *'Too much to do in a short period of time. More stress than stimuli'*, *'What was expected to learn from the quiz was quite confusing since it was so much to read'*, *'Timing of supervisions could be better placed'*. These comments give an indication of the measures that need to be taken to improve the course further.

10. Prioritized course development:

Based on the input and analyses made above, the following activities are prioritized for course development for the next intake:

1. See over the lecture slide of the individual teacher to reduce repetition
2. Streamline the publications
3. Highlight the expectations about the report and the quiz
4. Prolong the duration of the course to reduce the pace
5. Discuss with the Swedish students to understand the issues that may be faced by this student category

The interview with the exchange students revealed one critical aspect which I think is a strategic issue for KTH to look over to make the onboarding of the exchange students better. The exchange student felt that the way of teaching in KTH is significantly different than their home universities. It takes a bit of time for them to get used to this new system. If the pace of the first course that they take at KTH is too fast they face difficulties in adapting.

In this respect, KTH or the departments that accept exchange students can organize some activities to make the exchange students familiar with the teaching approach at KTH in advance. This will make it easier for the exchange or even international students' onboarding to the new teaching systems.

MG2043 - 2023-10-11

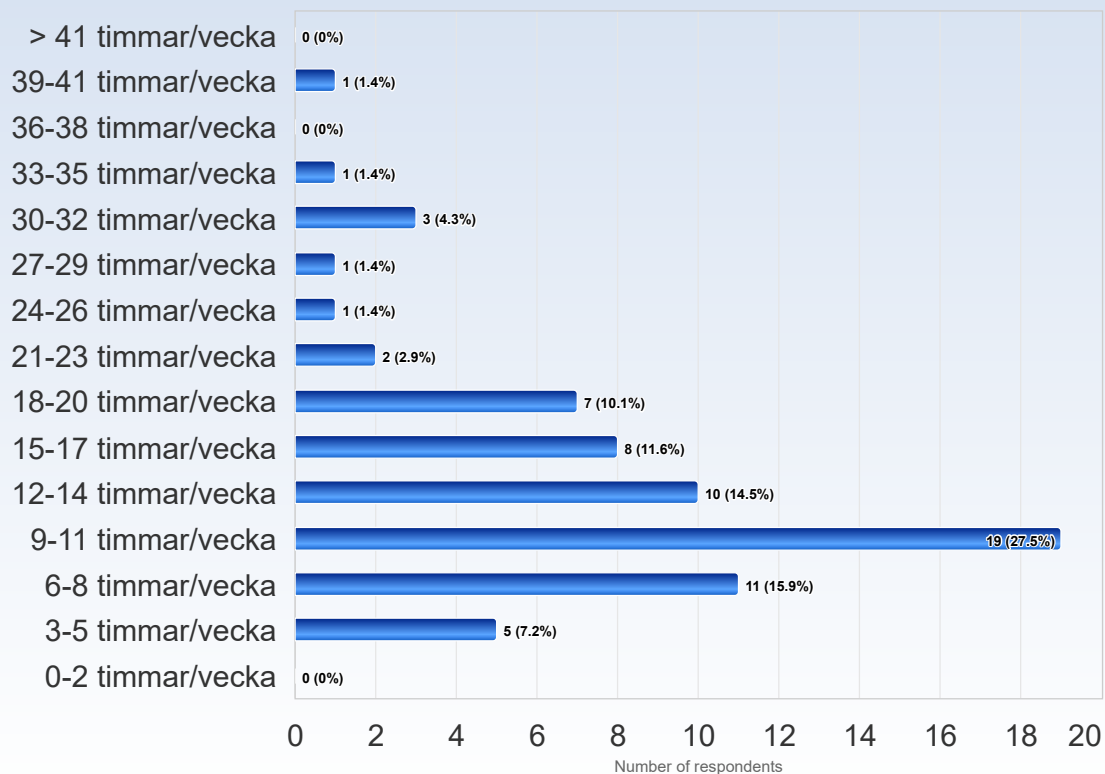
Antal respondenter: 81

Antal svar: 69

Svarsfrekvens: 85,19 %

ESTIMATED WORKLOAD

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



Comments

Comments (I worked: 3-5 timmar/vecka)

The amount of time that are spend for the course depends in my opinion strongly from the other courses that have to be taken.

Theoretically there can be spent a infinite amount of time, especially for the project.

The course doesnt take much time and is basicly just pandering towards an unsustainable idea of greenwashing industry.

Comments (I worked: 6-8 timmar/vecka)

Bout 4 hours a week were the lectures. The other work was individual towards our group project.

Workload is not a bog problem

I liked the subject of the course and think it is important for the engineers of the future to have an understanding of it.

Very interesting course, loved it from the start to end

I would not say that it was too much to do but the report and preparation before the quiz was time demanding.

Nil

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

Most of the time invested was related to the project

Good pace, interesting lecture

it'a a lot for the reading but if we begin early it's okay

It was good to understand the circularity in business models of all things. This made me expose to a new thing with new ideas and thinking.

very interesting course about circular economy, circular manufacturing etc. i do lot of reading to understand the concept.

A lot of reading for the quiz of papers that were in many cases repeating the same material, same could be said about the lessons, every lesson added something new but also repeated a lot.

I did the cost part of our report which is very important for a startup but did not have much to do with CMS, so it was a lot of work, but mostly busywork that didn't teach me many new things (I had already done similar things in more detail in my bachelors).

The course was very well designed and delivered the key aspects from the latest research in the industry in the form of lectures and seminars, whose schedule was not at all concerning with respect to number of hours per week. However, I personally ended up spending more number of hours as most of the workload in the project fell on me eventually (All thanks to my dear team :-)

Comments (I worked: 12-14 timmar/vecka)

Since there is a lot of people in the group (7) the work is well distributed

The time to spend on the course is fine to me.

The workload was pretty much fair even if the project required lot of extra hours of team's meetings and continuous alignment in order to be ready

It was different from the one at my home university: this study method was based a lot on the homework instead of the in-class one. In any case, it was a new method of study that I experimented with. I would have explained more things in class instead of having them read to myself at home

The course, in general, is very interesting.

i followed the lessons during the weeks and then with my group we worked on the project. the course was well structured from my perspective and clear to follow the concepts

Very Interesting and timely course

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

varierad quite a lot, Was very hectic towards the end

In the beginning , very little time spend as not enough information on the project given.

The project was very time consuming due to much research

It is an exciting way to learn the course as we were supposed to do a project on it. The classes were engaging right from the start, this made it easy for us to understand what to include in our project and what not to do. Continuous evaluation and feedback from the professor made it easy for us to understand the gaps in our project.

CMS is a new topic and unique in KTH. So it needs a lot of reading. Also during the presentation, only main concepts are touched upon. To get a more holistic understanding, it needs a lot of reading. The CMS is really interesting and Challenging

Comments (I worked: 18-20 timmar/vecka)

Liked that we could work in class about the project in order to get some feedback

apart from lectures, had to review course materials and work on the project either in group or solo

Outside the lectures the reading material and project required allot of time.

Comments (I worked: 21-23 timmar/vecka)

there was less time remaining after so much of reading material and project work.

Comments (I worked: 24-26 timmar/vecka)

Vissa veckor väldigt mycket,

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

Quantity of work was ok

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

Without spending this much amount of time it is not possible to be prepared for the final presentation and the report.

The course requires lots of individual (reading papers and just general study) and group work. Sometimes the lectures, being very close in content to the papers, felt like duplicates of the research material and therefore as time that could be better spent on individual reading.

Comments (I worked: 33-35 timmar/vecka)

this is due to I was a late admitted student

LEARNING EXPERIENCE

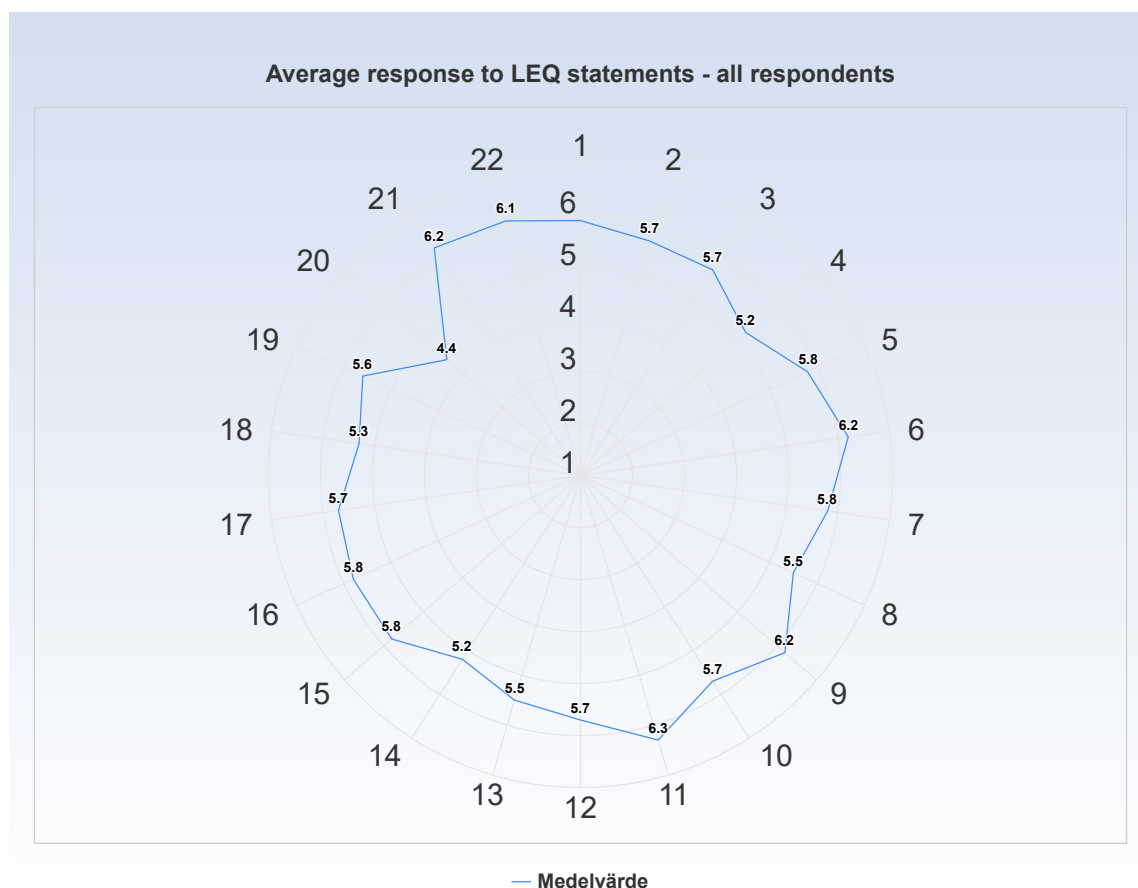
The polar diagrams below show the average response to the LEQ statements for different groups of respondents (only valid responses are included). The scale that is used in the diagrams is defined by:

1 = No, I strongly disagree with the statement

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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.



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.

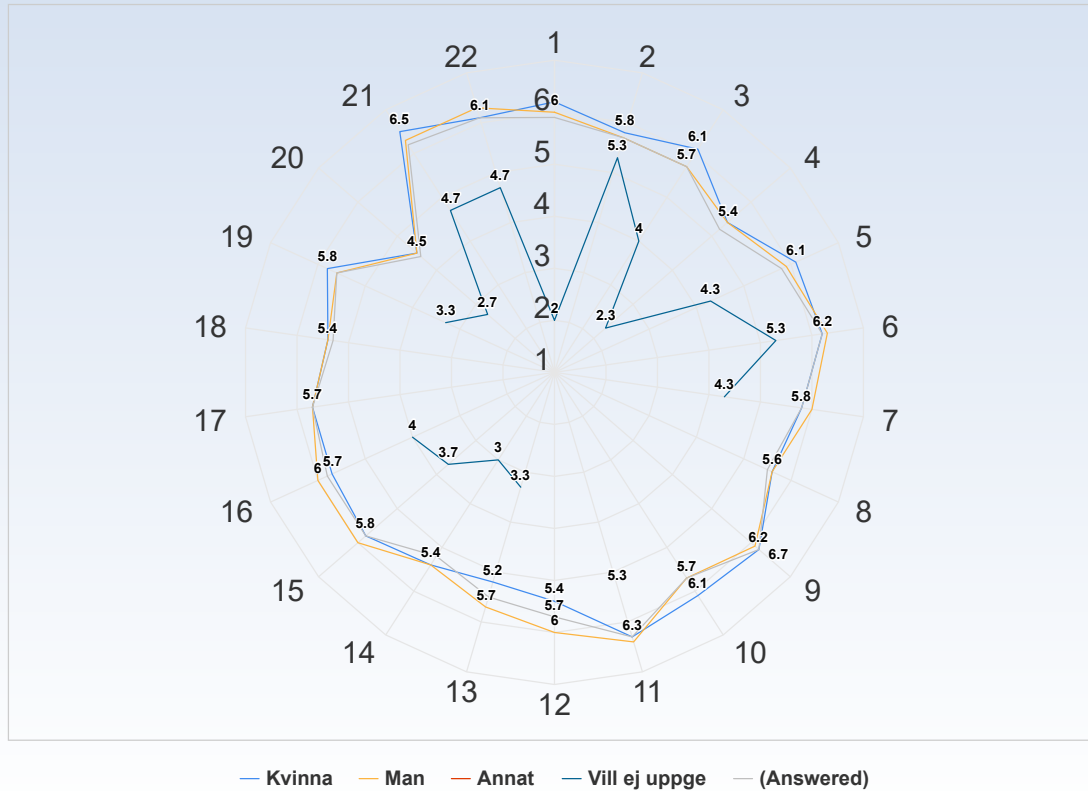
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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



Comments

Comments (I am: Kvinna)

Female percentage can be increased in course
 there was no different gender based

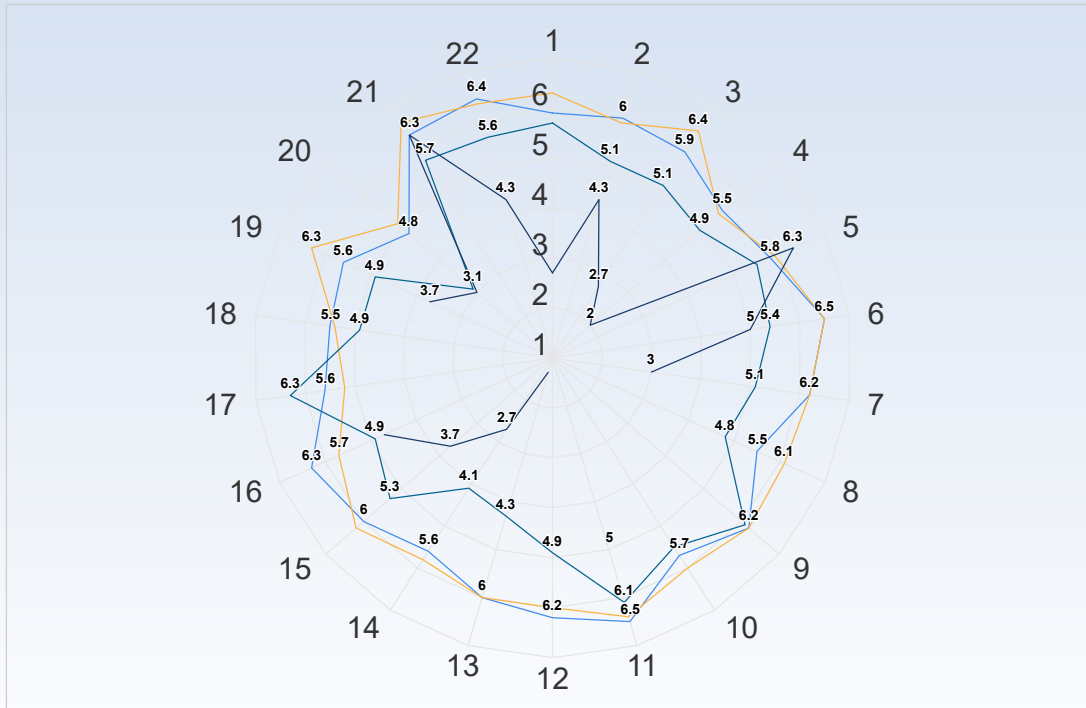
Comments (I am: Man)

Course was great.
 It was great
 there was no issue with equality. everyone was treated in democratic way
 everything was fine
 A great welcoming class where everyone feels included headed by Mr.Asif with great positive attitude

Comments (I am: Vill ej uppge)

NA

Average response to LEQ statements - per type of student



- Internationell masterstudent
- Svensk student i årskurs 4-5
- Internationell utbytesstudent
- Annan typ av student
- Svensk student i årskurs 1-3
- Vill ej uppge

Comments

Comments (I am: Internationell masterstudent)

fine
 Recycling was the only familiar concept before taking up this course. By taking the course, I came to know all aspects playing a vital role in Circular economy.
 NA
 I would like, when grouping, if there was a mix of students in a variety of nationalities

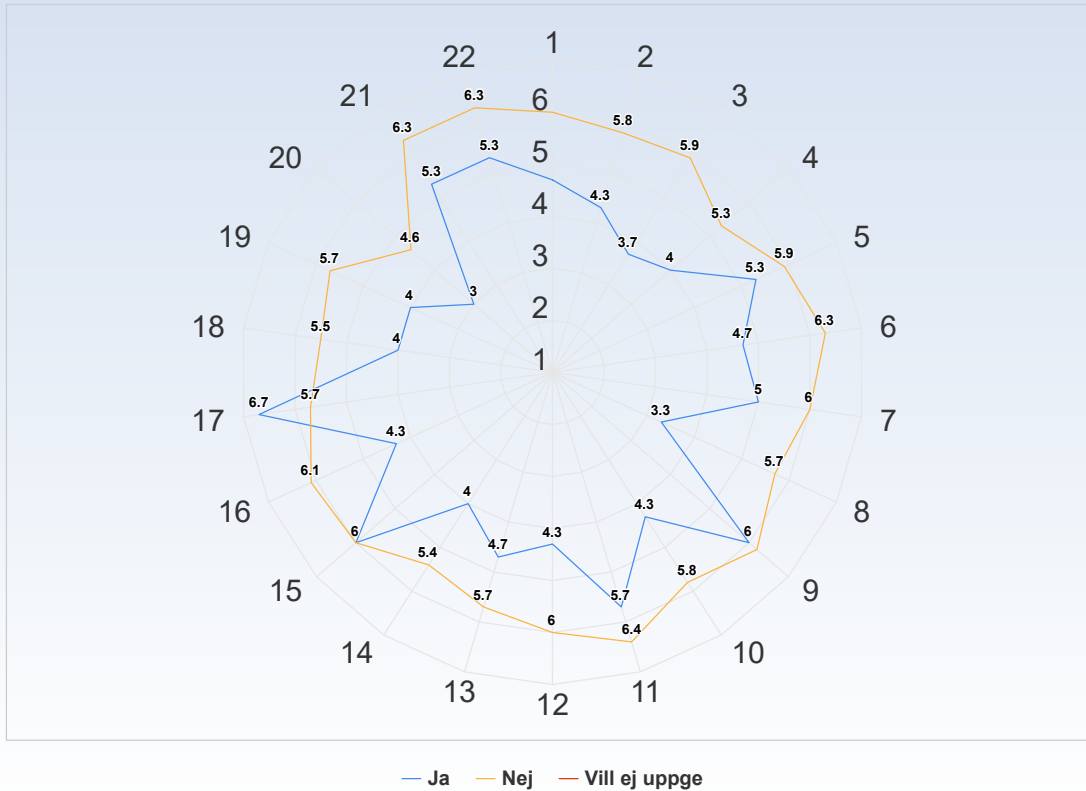
Comments (I am: Svensk student i årskurs 1-3)

The course is interesting and timely

Comments (I am: Svensk student i årskurs 4-5)

varying level on engagement and knowledge in group.

Average response to LEQ statements - per disability



Comments

Comments (My response was: Nej)

People with unexpected disabilities during the course time, can be evaluated differently. Because their presence in any team would be a 'one man down' and others would have to work more for nobody's fault. Hence, having separate way of evaluation as a backup for worst cases would help the disabled person as well as the team.

Not made for dyslectics since it is mandatory to read 23 articles á 10-15 pages.

Comments (My response was: Vill ej uppge)

That is not nice to ask

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 3-5 timmar/vecka)

That the course was very innovative and modern

Interesting topic in a new field.

Course addresses an important topic.

In general it explains well the circular principles and what is to be needed to implement it.

-

What was the best aspect of the course? (I worked: 6-8 timmar/vecka)

Got an in depth and great overview of Circular manufacturing and all the processes involved in circular business models.

Creating a startup idea and creating a company out of it

The lectures really explain in depth the Circular Manufacturing principles and the key points that we need to pay attention to.

I liked that the subject was easy to relate to and I think it will be useful in my future career to keep in mind.

We had the opportunity to create something on our own which helps us understand the issues that might arise and also provide solutions to it.

The best aspect of the course, in my opinion, was the learning opportunity. I learned different pillars of the CMS that helped me to understand the concept of circular economy.

Introduction to circular economy and aspects related to it. Advantages of a product being in a circular model, Sustainability.

The course work, thinking of an own business idea.

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)

The opportunity of working with people from all over the world and see other ways of working and face the project

Long project, we really had a chance to integrate our ideas. Teaching was very good.

Learning the basic idea behind start-ups. The way of thinking needed and how to act in order to close the gaps, especially in cm.

Best aspect about the course was a challenge of working in a group with so many different people and backgrounds.

The project is the best party but maybe we have to be more accompany to not work at the end

The fact that we worked in teams

We are working in teams and that is a very good example of our future job. Challenging though

To me the best aspect of the course was the four pillars that exposed me about the business models and all other things.

To get a wholistic view of circular economy and CMS.

Group work helped in meeting new people and solving problems together

The best aspect of the course was that it talked about all aspects that are currently important and have to be addressed.

It's the group work and socialise with other groups as well.

The best aspect are the lectures where we can learn the basis of CMS and this was really interesting

The CMS Project helped us with teamwork and implementation of the fundamentals in a real life scenario.

The classes were precise and the helpful.

The reading material provided was curated nicely and helped us with the quiz.

I had the opportunity to learn the circular business aspect of a product or service at a large scale.

I think CMS is a really important aspect for all engineers and more to think about on and implement in the future ventures.

The course allows us to develop new and interesting ways of thinking for our future work

- It is to be appreciated on how the latest research in the field of CMS has been incorporated in the lectures rather than content from a text book just like in any other course.

- The best aspect of the course was the seminars which were coupled and conducted with/after a lecture, this gave a sense of practicality in the way of teaching and enabled a push towards implementation of key concepts of circularity into the project which otherwise would have taken much more time than just 2 hours.

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

Get practical and be given the opportunity to create a circular business on our own, with our own ideas

The project group

The course covered interesting topics and was overall well-structured.

The possibility to create our own business with our own ideas

I think that the best aspect of the course is that during the lesson we covered the important topics of the subjects and then we had time to work on the project with the group. Also I really enjoyed the topics that we covered during the course, I think that they are really interesting

Learning more about the circular economy and the challenges faced. The course also delved into how to start a profitable business that implements a circular business model.

Learning about Sustainability is interesting and best to practice it in the project

To have the opportunity to practice and have better understandings of theoretical knowledge with project.

Really struggling since there wasn't much good. But I'd say that the team building was good.

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)

The project is a great opportunity to learn how to work in a team.

Very interesting project, I like that we continuously used the course material in a real life project and got to be creative.

Interesting to be able to choose your own project, since it will be something you are actually interested in.

The Project was fun but I think 7 people in one group is quite a lot and challenging to arrange. Result depends heavily on the entire group.

The group cooperation

When it was over

Definitely the project.

1. The Subject is new and has a lot of potential for application. CMS will play a major role to play in Future.

2. Lectures demonstrated the concept with practical examples

What was the best aspect of the course? (I worked: 18-20 timmar/vecka)

Working with people from all over the world

The group work in the project

Getting good understanding of circularity.

Course made it simple to understand circularity. Teachers were always supportive.

What was the best aspect of the course? (I worked: 21-23 timmar/vecka)

Course structure and teachers

What was the best aspect of the course? (I worked: 24-26 timmar/vecka)

Roligt med ett stort projekt

What was the best aspect of the course? (I worked: 27-29 timmar/vecka)

The team project was a good way to use the new notions

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

The group Project

The interactive seminars and formulation of the pitch and the overall project.

Very hands-on approach, lots of learning to be done in individual/group research.

What was the best aspect of the course? (I worked: 33-35 timmar/vecka)

apply all the theories for own case

What was the best aspect of the course? (I worked: 39-41 timmar/vecka)

The project, you learn the most when you have to put in practice new knowledge.

What would you suggest to improve?

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

Nothing

It felt that content was sometimes a bit repetitive.

Either just remove the course or make it more objective by disclosing the facts and talk about the reasons as to why customers like to own their own products and why the industry standard today is focused on linear economy systems.

What would you suggest to improve? (I worked: 6-8 timmar/vecka)

Make it more clear what is expected in the final report. A lot of the lectures started with the same basics of CMS, essentially repeating the same info again and again.

Avoid repetitions after every class

The goal of the group project is to put in practice all we've learnt during the lectures, which is helpful. However, to do so we need to create an innovative product or service even if we don't want to create a start-up in the future.

I did not like that the final presentation took a whole day as I did not find it useful or learned from listening to others. It took too long and it is draining. It did not further my understanding on the CMS subject.

I would suggest an improvement in the instructions for the quiz. It was very unclear what we had to know for the quiz. Maybe more specific and present what we need to understand before the quiz.

The final presentation session took all day and could have been divided into two sessions. In this case, students would listen to other groups but be able to concentrate better and show better results. Some groups had to wait 4-6 hours for their time slot and that was difficult to perform under such circumstances.

Rather than expecting a student to ask, Clear cut requirements of the draft can be suggested via a format.

The theoretical input was in my opinion a little bit too low. While it was a nice way to get into Circular Economy, I would have liked to have more hands on programming/ using databases/ simulating. In my opinion the depth was not too high for a master course, also compared to my home university. This also includes maybe the design of a product in CAD, choosing materials, covering in-depth cost and market analysis.

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

I honestly think the course is really well structured, I wouldn't change anything

Last day with 8h of presentations is too much.

Less papers to read the main summary of the lesson.

Better guidance on what exactly we need to do and what needs to be in the final report.

more accompaniment for the project and an example of what is expected for the quiz

to give more reasons to come to the lectures, basically the lectures didn't give us something

less number of articles in the quiz since a lot of information is repeated. Also regarding quiz I didn't know what to expect in terms of details (how much information we should remember).

But the quiz was okay you had to remember the most important parts.

Improve on extending the dead lines for the assignments.

Quiz should be based on the lessons and not on many articles that are boring. This would also help with more presence during lessons so people just don't decide to go because they can read at home.

Most classes ended up as group work but more attention on learning concepts could help

Nothing that's all I say

The quiz on reading material is not relevant because it is harder to learn things just by reading thesis.

The quiz was also held too early (before the end of all lectures)

The timing of the lectures could be planned to be after 10am. It was hard to wake up and attend the classes at 8.

The projects can be graded on different criteria such as Best Project Idea, Best Project Presentation, etc instead of just the one "Best Project".

Maybe having multiple case studies and involving different groups of people to work together will improve knowledge on real life problems.

A large part of many lectures was repeating the same few points again and again about what CMS is, what makes it different from LMS etc. Material that was covered in 2 lectures could have been condensed into one or explored in more detail, except the modeling lecture that one was very fast and information dense.

7 people is really big for a group, especially for the presentations but I guess it does make sense for the detail of the report and the time given to work on it. Even though the course is CMS the big project is more how to make a startup and so moves students focus away from CMS to how to make a viable startup without really going into enough detail on the accounting and ROI side for example.

Trim down the papers a bit, there was a bunch of overlap between different papers.

Understand the objectives of the group project more quickly

Since this course is starting right in the first period and the course requires us to choose the team right in the beginning, it is very difficult to find the people whom you want to work with. I ended up choosing a bad team, because honestly I had no idea that they would turn out to be that bad eventually (Bad when compared to the vision that I had for the project and efforts expected to be put as an individual), without even contributing a little towards the project. In the beginning, I kind of knew that this problem might happen, but eventually realized that I was actually experiencing what I was scared about, which ended up being a very bad night mare for me in terms of the amount of efforts (work load) that I had to put all alone or probably with 2 more people alongside out of 6 more, although I tried to patch up all the worst gaps that the team had created, the presentation ended up being wrongly portrayed and became a joke. Since it is hard for anyone to find the people with same mentality right in the beginning of the course/program, I personally feel it would be a great idea to wait for 1 or 2 weeks, help students to mingle with each other through various interactive lectures/activities and then they could be left open to create a team.

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

maybe a group of 5-6 people is enough, 7 is a lot and sometimes it's not needed

besides also being difficult to coordinate everyone to meet

Sometime it happened to have too many hours in a single day

I would suggest to give students extra time even during lessons for team alignments in order to work for the project

Fewer articles to read by our own

Maybe on some topics some of us did not have any back knowledge on them, so maybe an introduction on the topic would make the lesson easier to follow

The quiz should be split into at least two small quizzes. It's really not practical to memorize all the details of 21 articles. Some questions in the quiz are very detailed and it's hard to memorize them for long time. If we start reading the articles very early in the semester, we need to read them again before the quiz.

Everything.

The "quizz" was terrible. You cannot hold an examination in a lecture hall where people are sitting next to each other. You cannot have different questions for everyone since the questions had varying difficulties.

The project should be removed / limited to a smaller part since like 60-80% of the project had nothing to do with CMS. basically a waste of time.

You should remove half of the lectures since it's basically the same thing over and over again since there is no course material for this course since CMS is basically one 2h lecture dragged out to an entire course.

What would you suggest to improve? (I worked: 15-17 timmar/vecka)

I think the course is great.

More clear grade expectations, we asked about what was expected from us but never really got a clear answer to what was needed to

succeed in the course. Also never got any clear instructions or report templates to follow for the report. Also won't agree with the fact the presentations took a full day. Could be divided up 5 by 5 groups and present during either morning or afternoon. This would allow for more flexibility and people being able to prioritise their time (eg do exam in morning and presentations in the evening).

I do not think that the arrangement of the quiz was fair. I was not able to focus since people around me were whispering and writing on their computers during the test. I do not think it is ok to sit in an overfilled classroom this close to each other and expect the students to be able to focus. So it would have been nice to either have the quiz from home or just in a bigger classroom.

smaller groups for the project and more continuous checkup on the progress could be implemented.

Have a better understanding of what is needed to get a high grade

The volume of the project was too big

Nothing really, the course is well set for students to understand it easily.

1. Some research papers are really hard in terms of language. It will be barrier in grasping the concept for those who are not good at English. Some papers were simple and interesting like Asif's, Rashid's, Bocken and Some of the papers from Cambridge University.

What would you suggest to improve? (I worked: 18-20 timmar/vecka)

-

some different course materials during lectures

Maybe give more time before the quiz.

To bring more examples of circularity into the lecture. It will help the students to understand many different aspects.

What would you suggest to improve? (I worked: 21-23 timmar/vecka)

The course content can be improved and time need to be increased in order to have time for project or start up work.

What would you suggest to improve? (I worked: 24-26 timmar/vecka)

Projektet var diffust vilket gjorde att man inte riktigt förstod vad man behövde ha gjort. Det fanns inga speciella krav som skulle vara med i rapporten utan bara att den skulle vara feasible, men det gjorde att när man sedan fick en peer review så var det saker man hade "missat". Quizet kändes konstigt utformat, varför ska man kunna exakt vad som står i vissa artiklar istället för att faktiskt lära sig koncept? Det känns mycket mer användbart att kunna koncept.

What would you suggest to improve? (I worked: 27-29 timmar/vecka)

Reduce the main readings

What would you suggest to improve? (I worked: 30-32 timmar/vecka)

Make the reading material more interactive instead of just reading 20+ papers.

The case studies explained during the lectures. The examples tend to get monotonous and the lectures can be a bit more detail oriented and in depth instead of just the basic details and the ideas.

Lessons may feel repetitive if the topics and examples are exactly like those on the papers. Also it could be interesting to hear other models of CE other than the one developed in KTH, just to have more of a sense of the global studies on the subject.

What would you suggest to improve? (I worked: 33-35 timmar/vecka)

i would like to suggest, when doing the own case with the team, it will better if you can monitor the progress of the project after done the theory part. At least 2 to 3 sessions.

What would you suggest to improve? (I worked: 39-41 timmar/vecka)

Write only seminar in the schedule if it is mandatory to be present. And write lection/föreläsning

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)

Start writing the report as quick as possible

Begin with the project early on and don't make it too complicated

Start early working on the project and with reading the articles.

Build a group and share the work of reading & summarizing the articles.

Critical thinking and exploring different concepts is detrimental in this course, just agree with the teacher and regurgitate it to pass.

What advice would you like to give to future participants? (I worked: 6-8 timmar/vecka)

Start early on :D

Find out what exactly is required in the report

Read the material in time so that it will not be piled up before the quiz. It also helps on understanding the subject before working on the group project.

Get involved to the concepts right from the beginning the course is fun

Come to lectures and try to do everything on time.

Grasp the ideas from the reading materials and lectures.

Align the grasped ideas with your project ideas.

If you have doubts regarding your project development or else if you're stuck at a place, feel free to have a meeting with the professor.

Read the paper after the lectures, otherwise the lectures are repetitive.

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

being actively participating in class with your group in order to advance with the project as much as possible

Start as soon as possible, stick to what you learn in the course.

Start working early. Paper studying and group working. No matter what the professor has done in the lecture, read the old projects and try to continue faster in your own.

Read the articles. They give you a better understanding about the CMS and are needed for the quiz.

don't do everything at the last minute, as there are other courses available

Not to go to the lectures

start early with the articles.. and to be honest not every lecture was interesting

Good for learning more about the business model implementation in a circular way.

Have fun while doing the project and find people equally enthusiastic as you. Then not be nervous during examinations.

Great to get an idea about how to work in a group to get all the concepts into practice

Active with the group members and understand their respective field works in the project.

Start reading the articles (reading materials) from the start of the course.

Choose your project team very precisely. Don't go for your friends.

Take the quiz and project work seriously.

Make use of the Project Supervisions by Asif to help you with your project.

Go through the presentations and you can get an overview of the topics.

Start early on the big project and make sure your idea is financially viable before the first idea pitch. Otherwise you are stuck with trying to make a good report about a bad idea.

The quiz is not so bad, work together to make summaries of the reading material to lighten individual workload.

Work and it goes

- Please choose the team that has the same goals as you do.

- Be a lead shoulder, if you end up choosing the team which is not as per your expectations, and start working from day one.

- In the worst case, don't waste time expecting your team mates to work on something once you've already figured out that they are not sharing the same goals as you do. Be a 'One man army' and do it all by yourself well in advance, so that you won't end up wasting more time in making them understand what they have to do again and again or correcting the wrong things that they have done or bridging the huge gaps that is created or end up being mocked on the day of presentation.

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

start the project early

a really good idea since the beginning is important, also think about all possibilities before you go ahead with your idea

To exploit the project work at best

I'd suggest them to start with the project as soon as possible and try to build a positive environment to work in

Start the project really early and think very in-depth about the idea since the beginning

Study since day 1 for the exam and collaborate with your colleagues in order to decrease the workload of everyone.

My advice would be to keep up with the lessons and do not lose time because the project requires time and effort and also to enjoy the process because it is a well structured project

Devote enough time for the project.

-

Choose a good topic for your project.

Don't take this course if you don't have to. I knew about as much about CMS before I took this course from a 2h lecture as I know now.

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)

Be prepared to work in international teams.

Start with the projects and reading materials in time since it is a lot to do.

I would give grade sheet of what's expected in the report for every grade.

Not choose the course if possible

It is an interesting course if we set our mind to it..Implementing the topics learned in class in our project is quite crucial

1. Choose a product based Project.

2. Try to put best effort in doing project and seeing the project as a learning experience.

3. Spent regular time in reading uploaded material every week and don't keep it till last minute

What advice would you like to give to future participants? (I worked: 18-20 timmar/vecka)

Working on the project every week and going to class

just follow the course seriously

Start reading the course material immediately.

To make an effort to spend some time finding more examples of circularity.

What advice would you like to give to future participants? (I worked: 21-23 timmar/vecka)

Enjoy the course but start with your project work since day 1

What advice would you like to give to future participants? (I worked: 24-26 timmar/vecka)

Börja tidigt med projektet och tänk igenom noggrant.

What advice would you like to give to future participants? (I worked: 27-29 timmar/vecka)

Read all the main reading and go to the lecture because it's very interesting

What advice would you like to give to future participants? (I worked: 30-32 timmar/vecka)

This is an intensive course which requires a lot of group work, thus it is important to choose good teammates who would be willing to work at the same pace as you.

Do not miss the lectures and be sure to work on the project and report daily.

Start doing deep research very early in your project. Don't underestimate how much the little details are going to impact on the final results.

What advice would you like to give to future participants? (I worked: 33-35 timmar/vecka)

project selection is need to done at the initial stage, that mean within 1st two weeks.

What advice would you like to give to future participants? (I worked: 39-41 timmar/vecka)

Be in a group that you know

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 3-5 timmar/vecka)

No

Maybe include some more examples in the lectures and articles. It was in many times about the washing machine.

-

Is there anything else you would like to add? (I worked: 6-8 timmar/vecka)

I didn't get the point of the quizz assignment: we needed to read 20 articles to pass the quizz and at the end remember not much from the readings. I learnt a lot from all the lectures about CMS but the assignment wasn't about that but about something we need to read on our own.

Teacher wants us to learn as much as we can from the course and is very helpful.

Nil

Is there anything else you would like to add? (I worked: 9-11 timmar/vecka)

Thank you so much for this months, I really liked it :)

Show how to do modelling beforehand and not only theory.

top!

no

No.

no

No

I think that CMS is a really interesting and important subject and I'm glad to have gotten a course in it but I think there is some disconnect between the lessons, papers and quiz on one hand and then the big project on the other hand. CMS is of course important in the big project but it is just one of many important things when it comes to making a successful startup, the course otherwise did not really touch on any of those other factors. Would maybe be better to condense all of the CMS lectures into half or 2/3 the amount and focus on startups for the rest and make it clear that the focus of lessons changes at that point if you want better big projects.

Personally I think the quiz and the deadline for the first report submission were too close together, quiz could have been moved a few days or a week earlier, or moved to the finals week and include all of the lessons.

NA

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)

Not really

No

-

This course should not be a mandatory course.

Is there anything else you would like to add? (I worked: 15-17 timmar/vecka)

I want to thank you the teachers for their time and their knowledge. I have learnt a lot!

Not really

Is there anything else you would like to add? (I worked: 18-20 timmar/vecka)

-

n/a

No.

Is there anything else you would like to add? (I worked: 21-23 timmar/vecka)

NA

Is there anything else you would like to add? (I worked: 33-35 timmar/vecka)

lectures were clear and if we apply theory to own case just after that it would be better I thought.

Is there anything else you would like to add? (I worked: 39-41 timmar/vecka)

Need more time for the writing part

SPECIFIC QUESTIONS

RESPONSE DATA

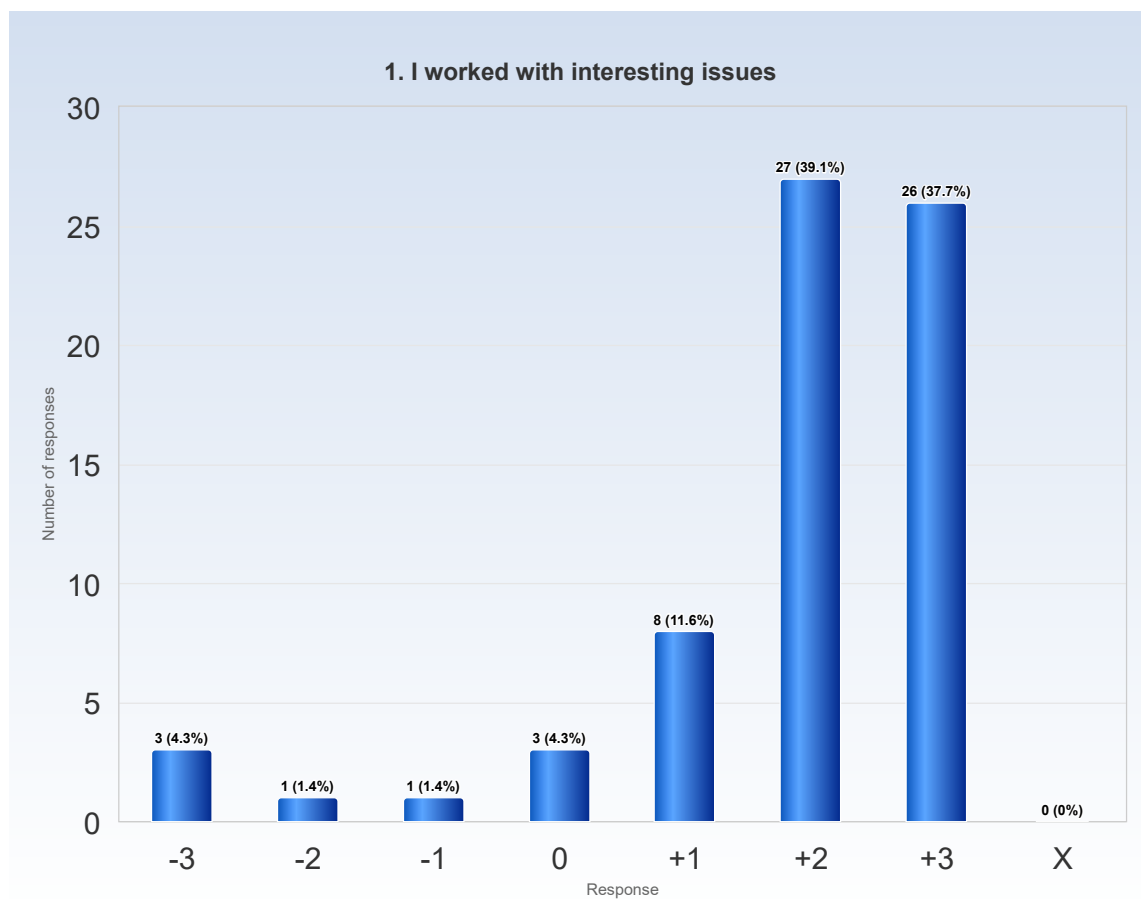
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-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



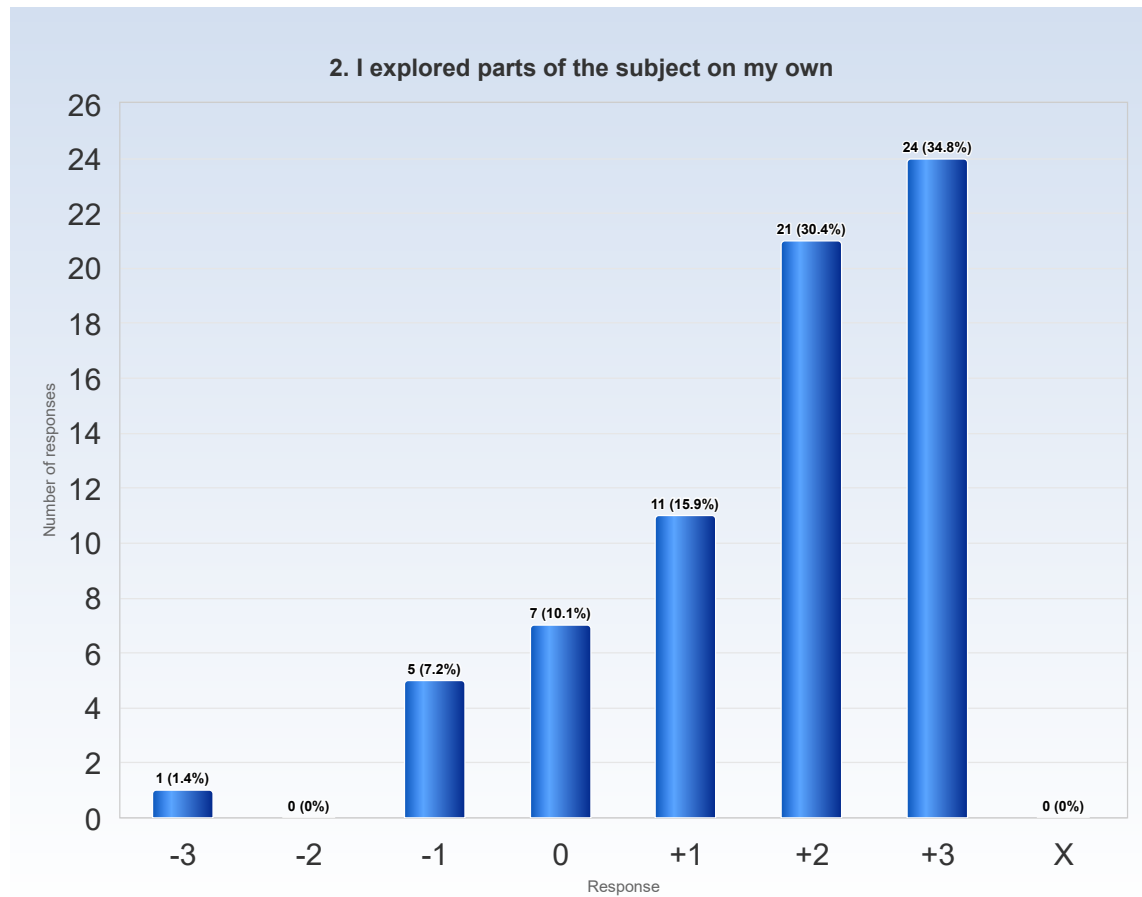
Comments

Comments (My response was: -3)

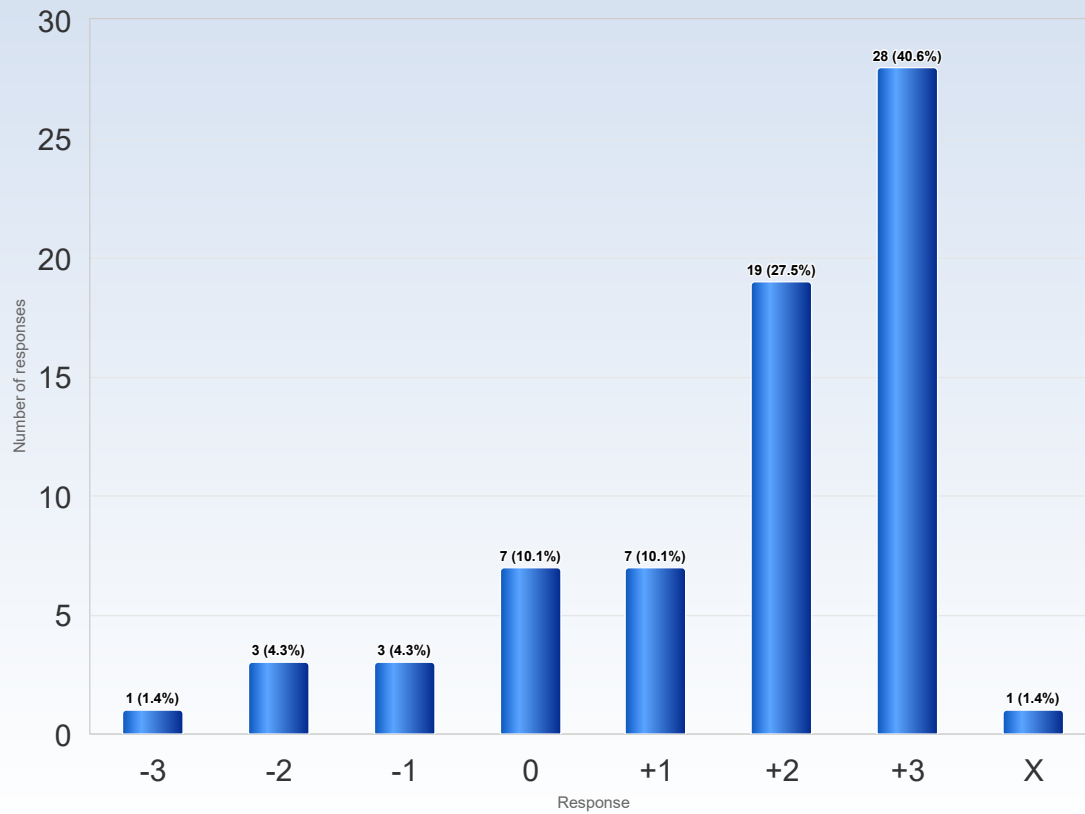
Initial idea of having such a project is great but in reality that meant having to research much stuff on topics that are not going to be of any value in real life. Really wasted my time

Comments (My response was: +1)

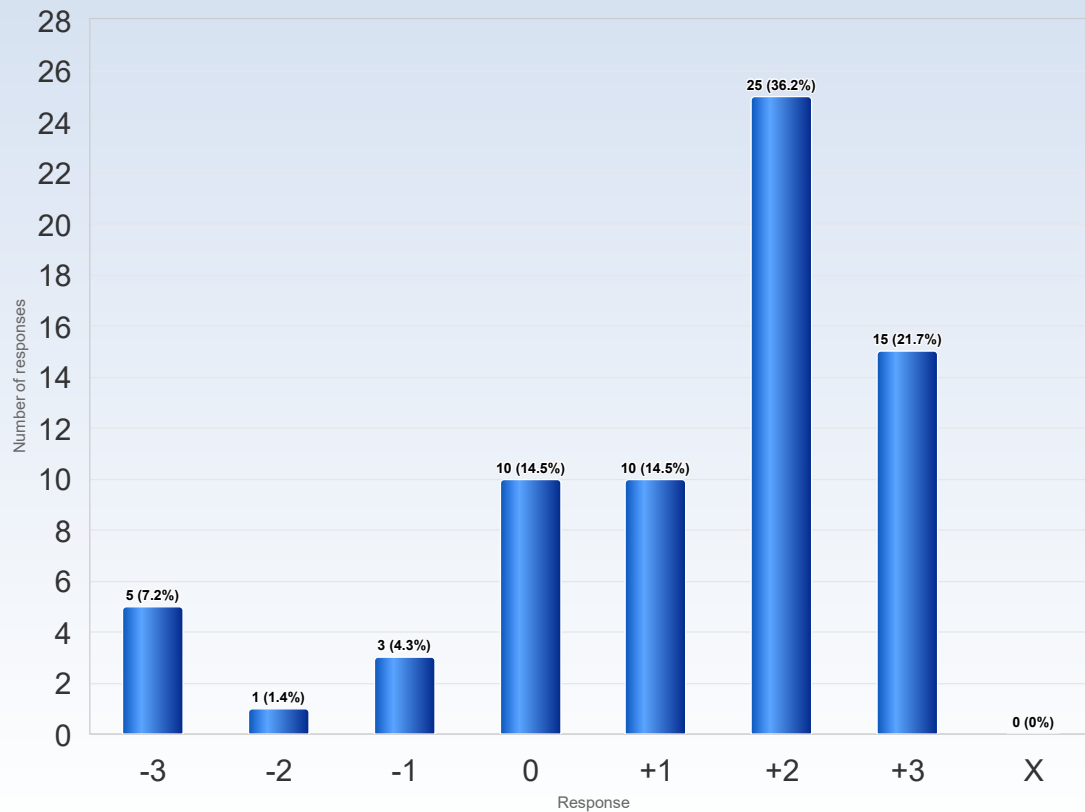
Due to project being the final goal, it did not allow me much to learn about different issues and where I can implement CMS.



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



4. The course was challenging in a stimulating way



Comments

Comments (My response was: -3)

I didn't learn anything. Examples about washing machines weren't good

Comments (My response was: -1)

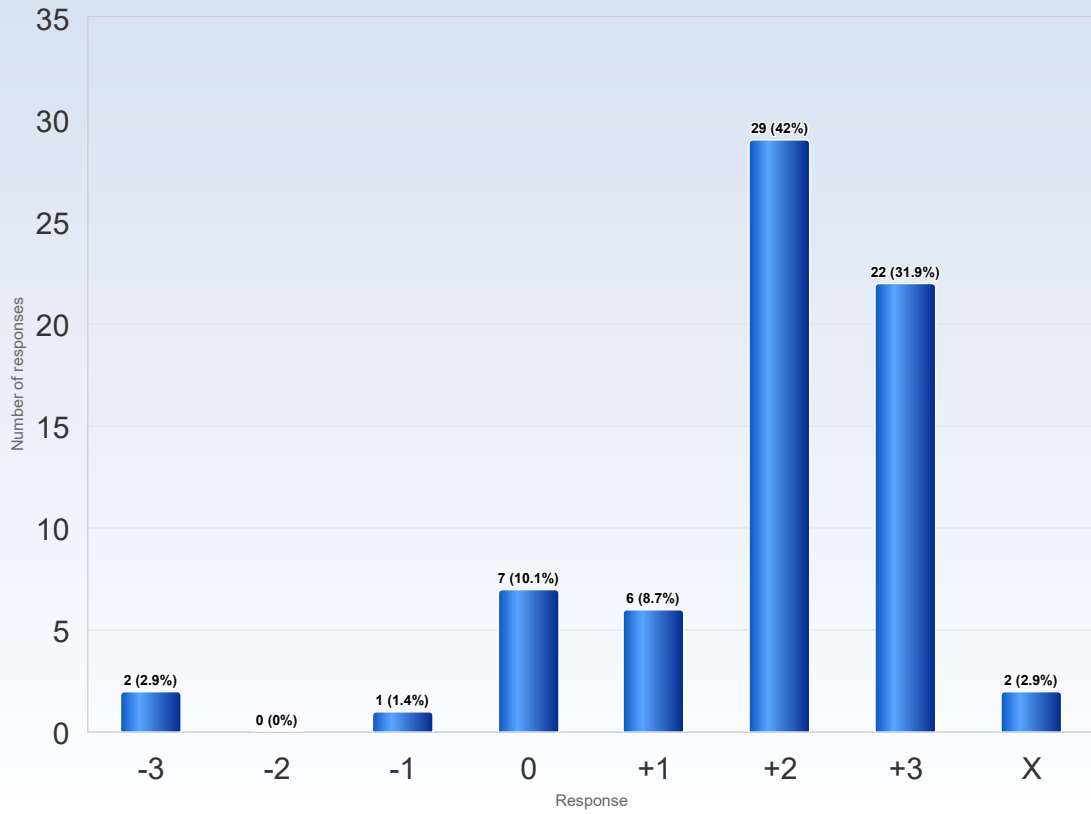
Too much to do in a short period of time. More stress than stimuli.

Comments (My response was: 0)

It wasn't challenging as much but the repetitive content made it a little difficult

The report took a lot of time but was not that challenging and did not teach me that much

5. I felt togetherness with others on the course



Comments

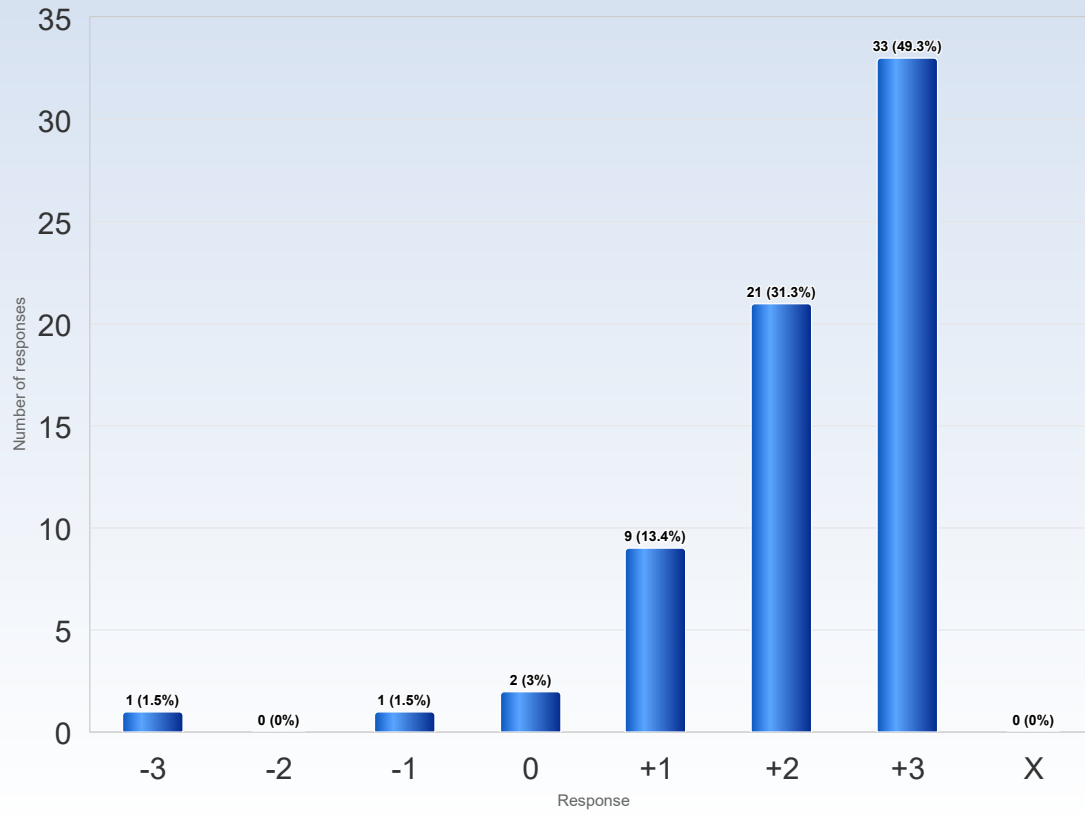
Comments (My response was: +3)

Great team

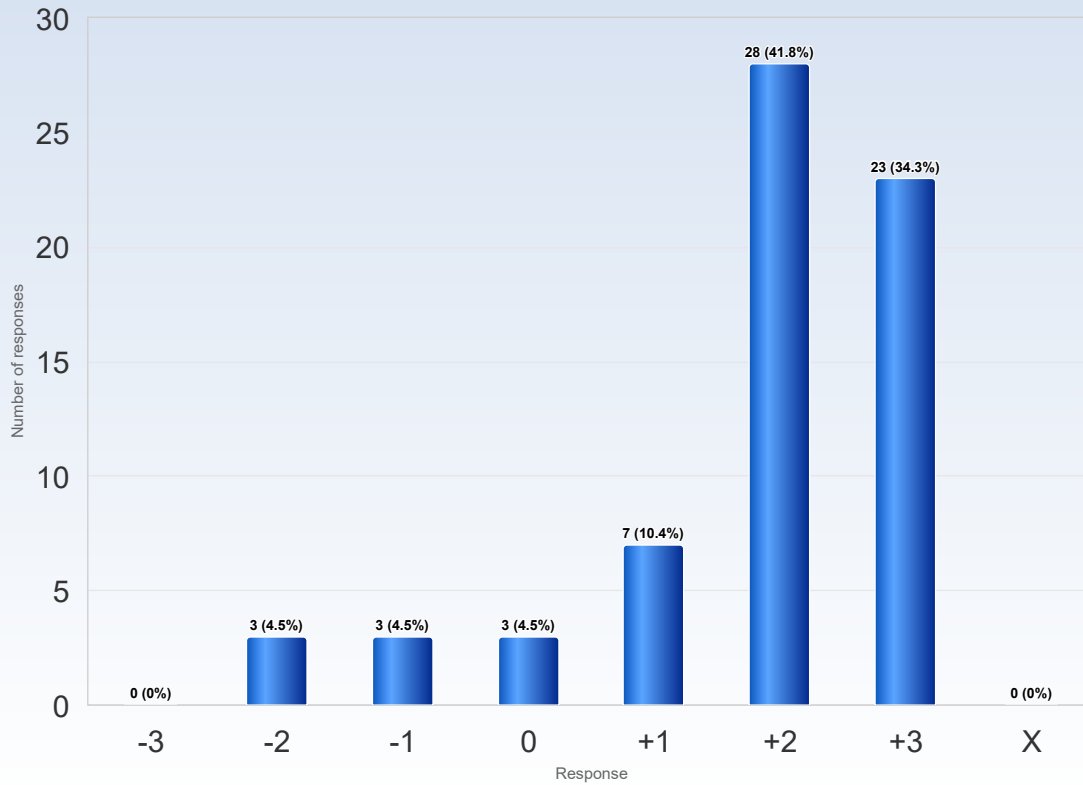
Comments (My response was: X)

What does that even mean in a non spiritual context

6. The atmosphere on the course was open and inclusive



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



Comments

Comments (My response was: -2)

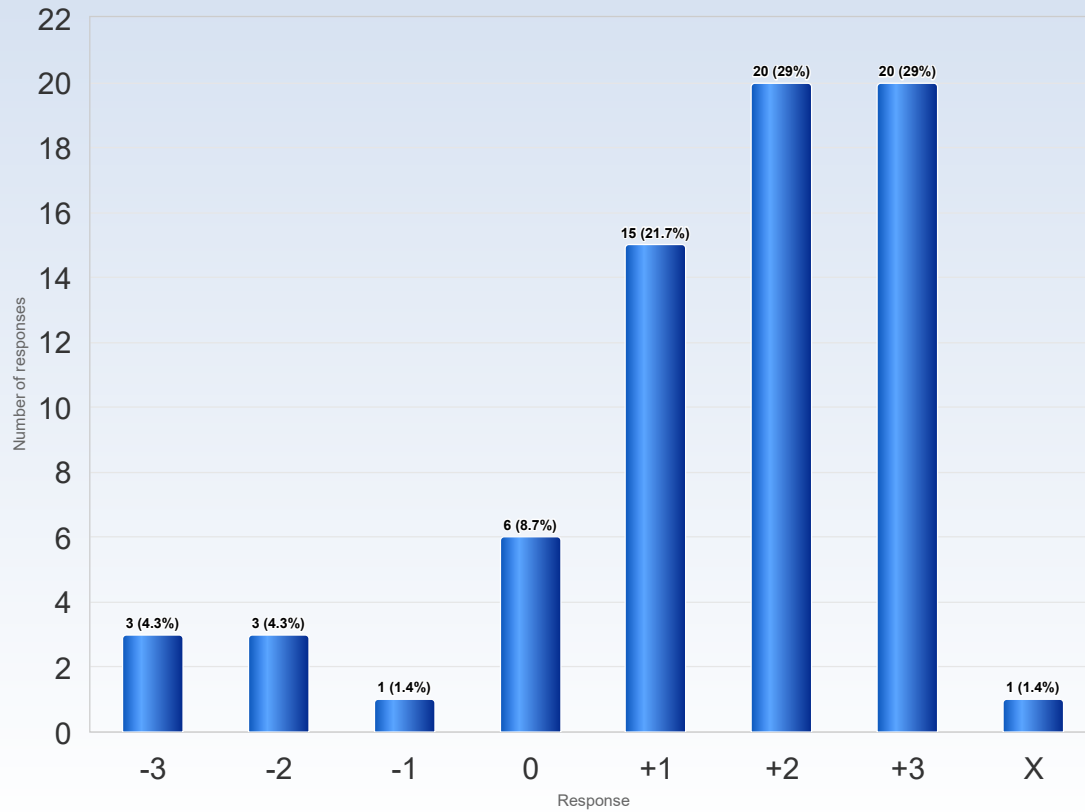
Not sufficient information given in some aspects, sometimes not at all

The outcomes seem extremely biased and subjective, a lot of the learning material is written by the teacher himself and is based on obviously scewed surveys.

Comments (My response was: +1)

Course helped me understand the basics for sure.

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

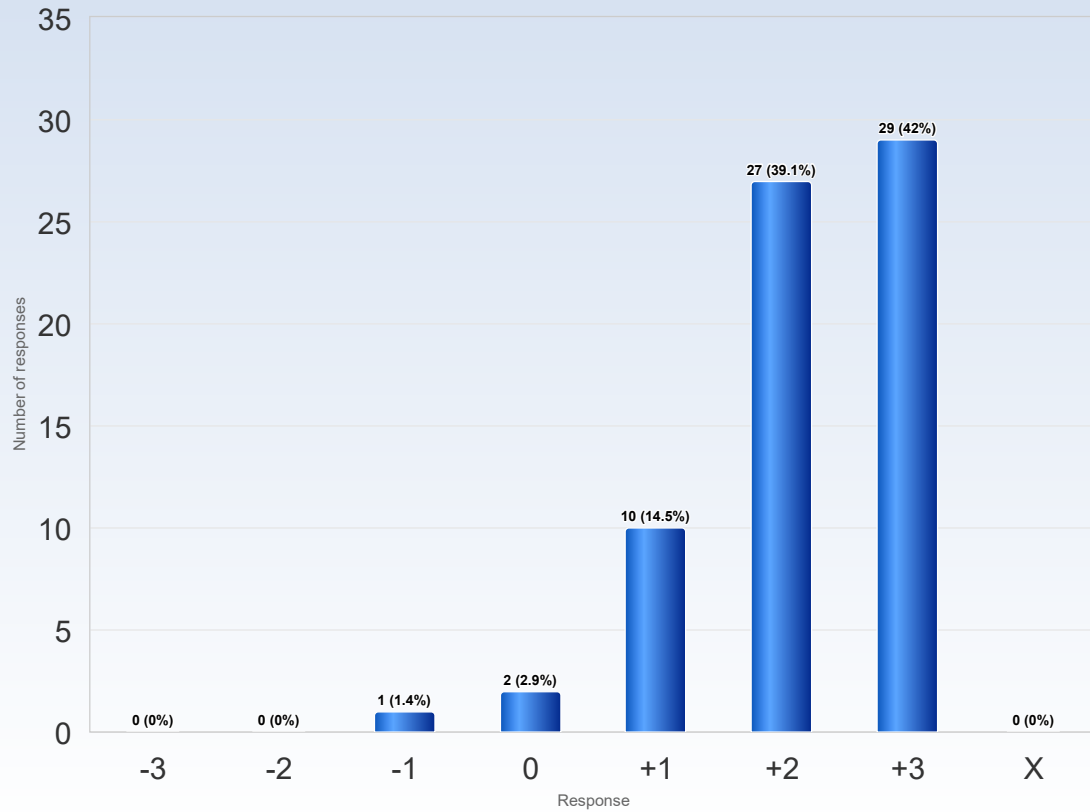


Comments

Comments (My response was: X)

Since reading the articles was a big part of the course and was actually the only "examination" on individual knowledge, it was not supported to helpwith learning

9. I understood what the teachers were talking about

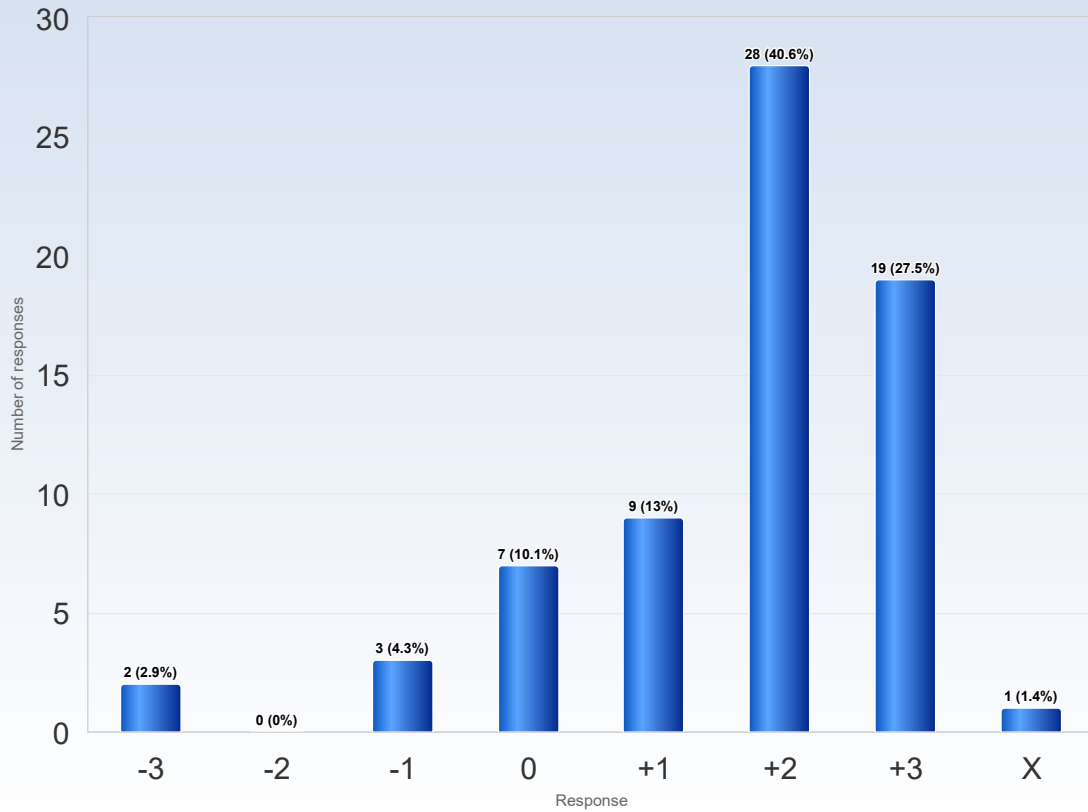


Comments

Comments (My response was: +3)

Was all common sense

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



Comments

Comments (My response was: -3)

I don't relate to washing machines

Comments (My response was: -1)

More different use cases are needed

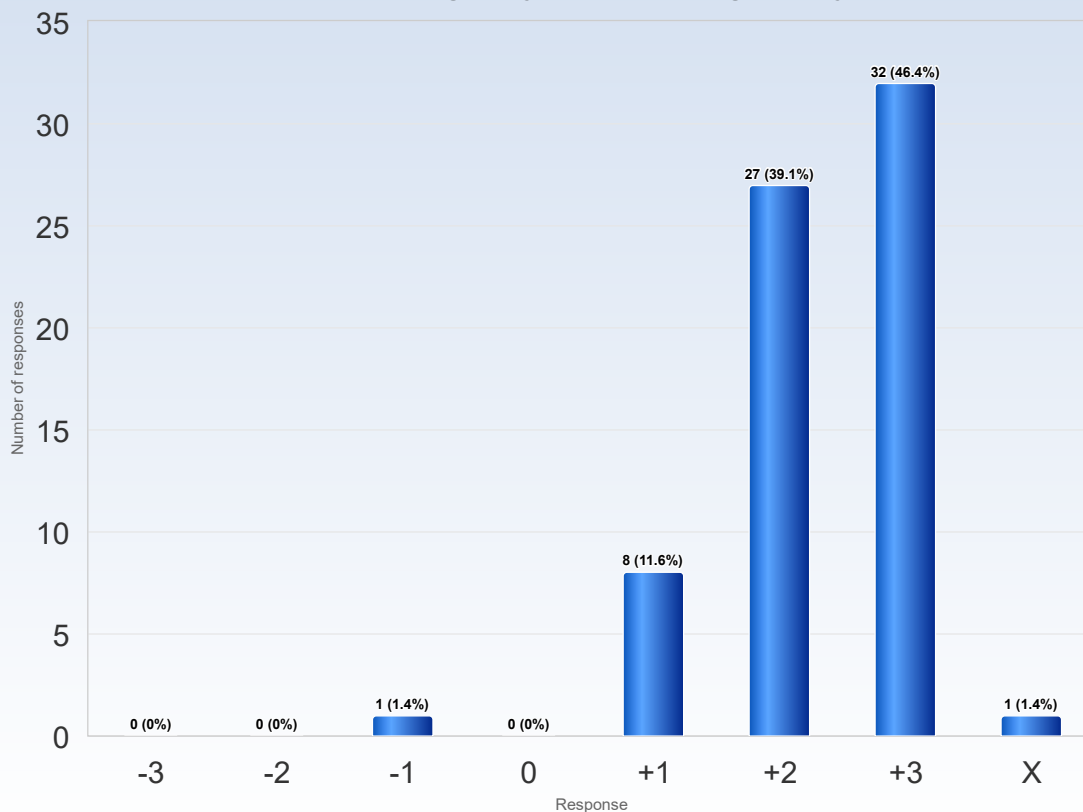
Comments (My response was: +2)

I dislike the use of HP as an example of a company doing good in CMS. They are an example of the exact opposite, they make printers that intentionally waste ink and jam regularly requiring you to use more ink to clean them. Then instead of using standard ink like for instance brother they do all that they can to force you to buy their ink, use chips to detect if you have refilled your ink cartridges and stop your printer from working. They also make you register your printer with an account to be able to use certain features. If you stop using it and give the printer away, the person who receives the printer can then not use those features unless you first deregister the printer from your account, see <https://i.redd.it/x887f5361cbb1.jpg>

Comments (My response was: X)

All examples were the same and everything was either by a renting- or leasing scheme which is only viable in limited companies. Should have other examples than this.

11. Understanding of key concepts had high priority

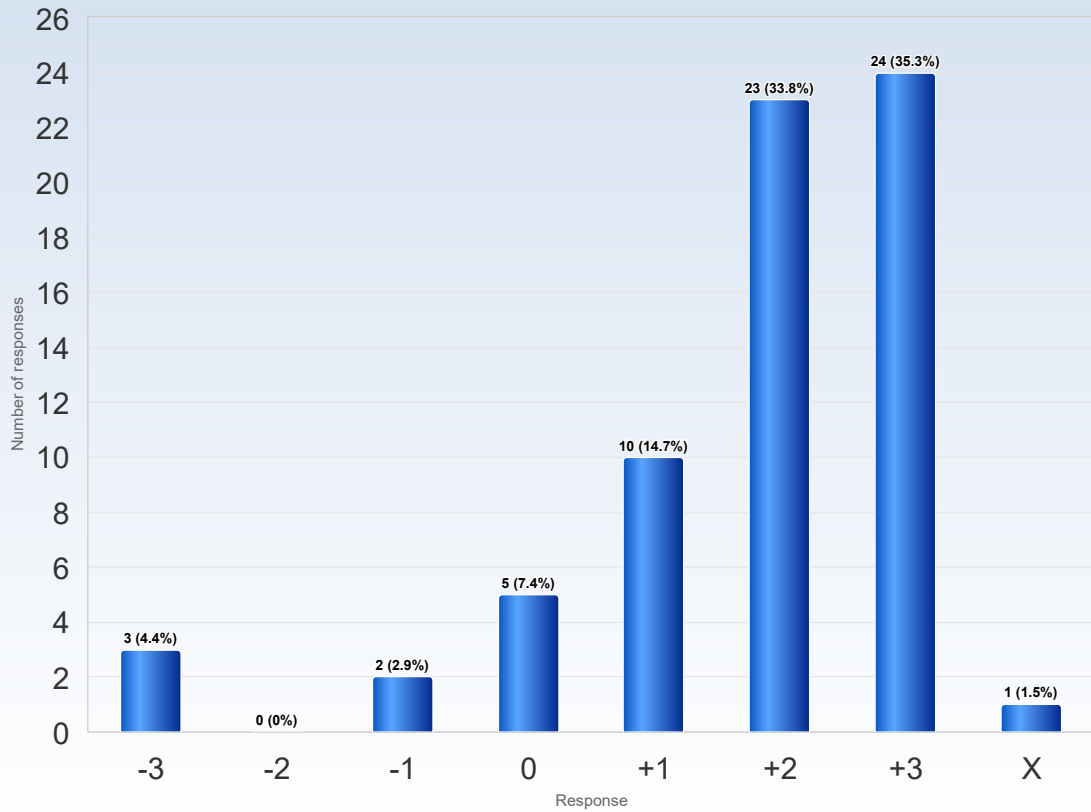


Comments

Comments (My response was: +3)

They were repeated a lot

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



Comments

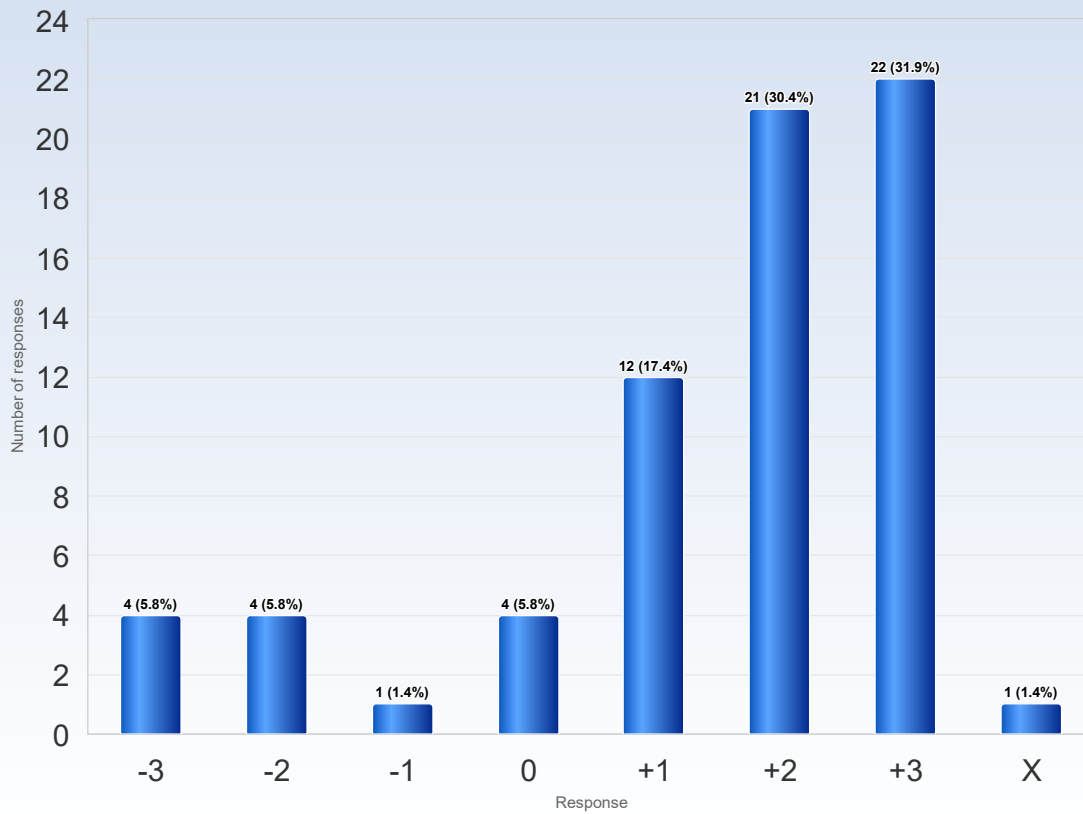
(My response was: -3)

I didn't learn anything

(My response was: X)

No. The project is the most inefficient way of learning about CMS since about 80% of the work was about other things than CMS. Reading all of the articles was also one of the most time consuming but worthless way of learning.

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



Comments

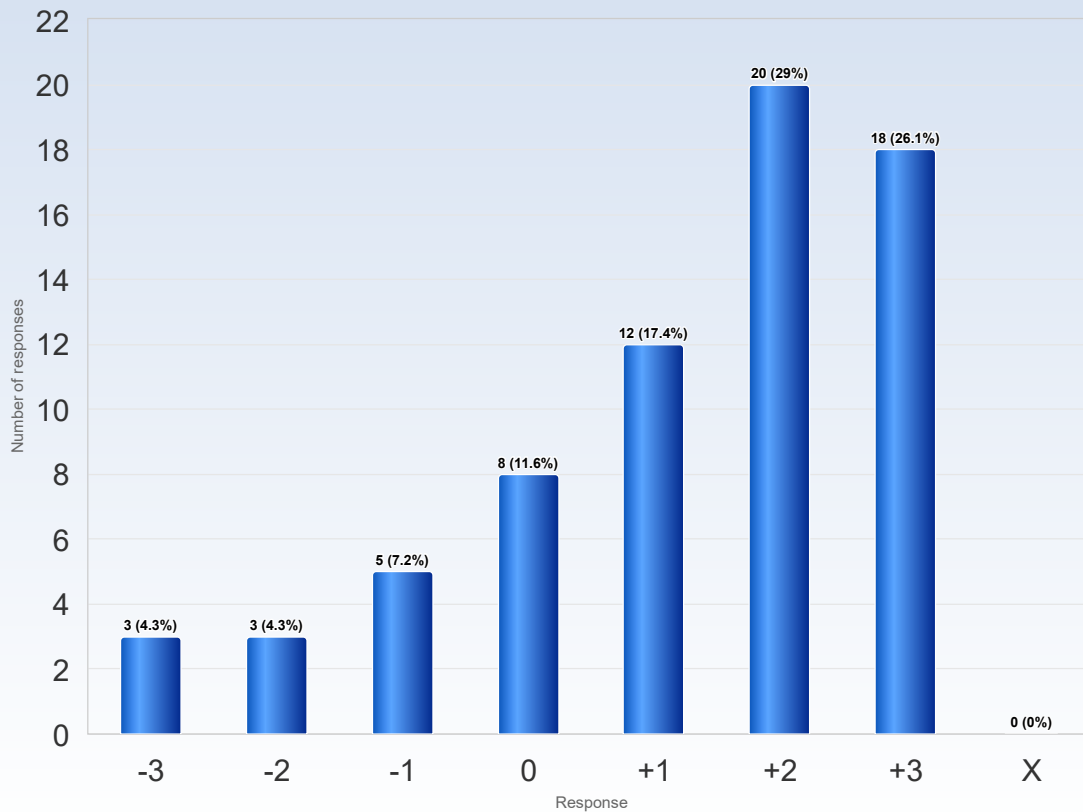
Comments (My response was: -3)

Lack of grading criteria

Comments (My response was: +1)

What was expected to learn from the quiz was quite confusing since it was so much to read.

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



Comments

Comments (My response was: -2)

We could ask questions for the report but there weren't really any other feedback

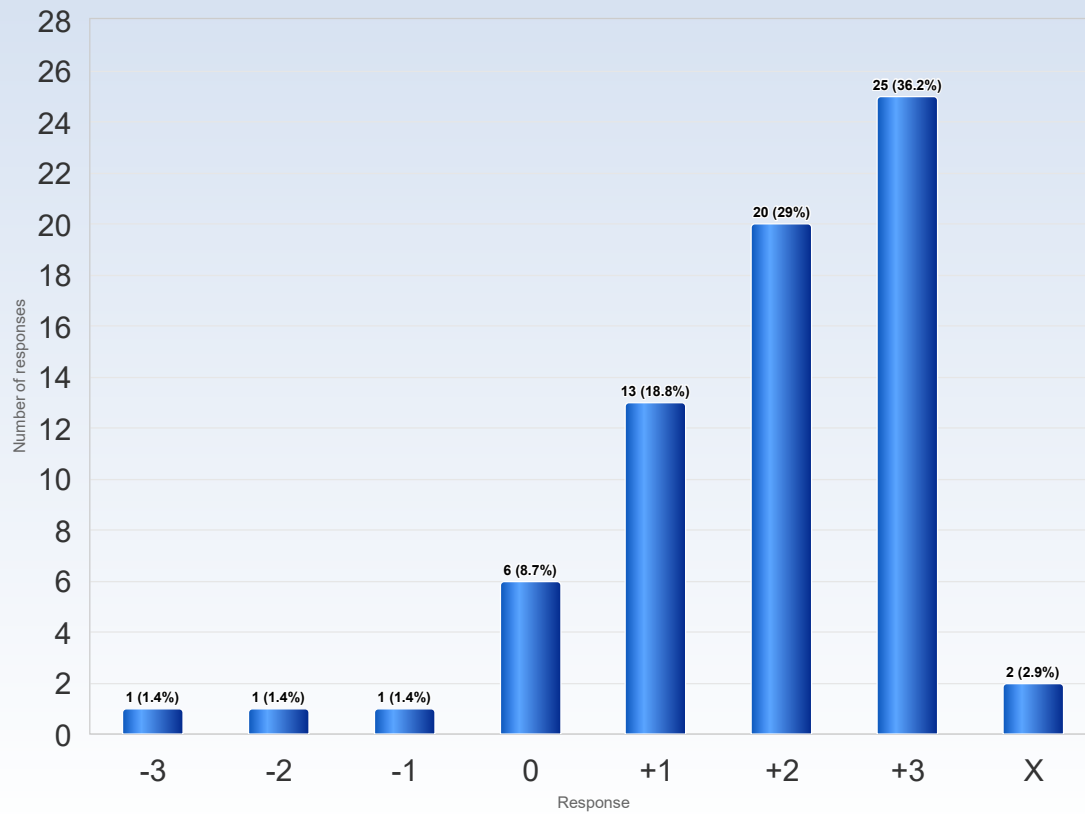
Comments (My response was: -1)

Not much feedback throughout the course but suddenly all during the presentation. It would be better to get opponent feedback earlier

Comments (My response was: +2)

Timing of supervisions could be better placed

15. I could practice and receive feedback without being graded



Comments

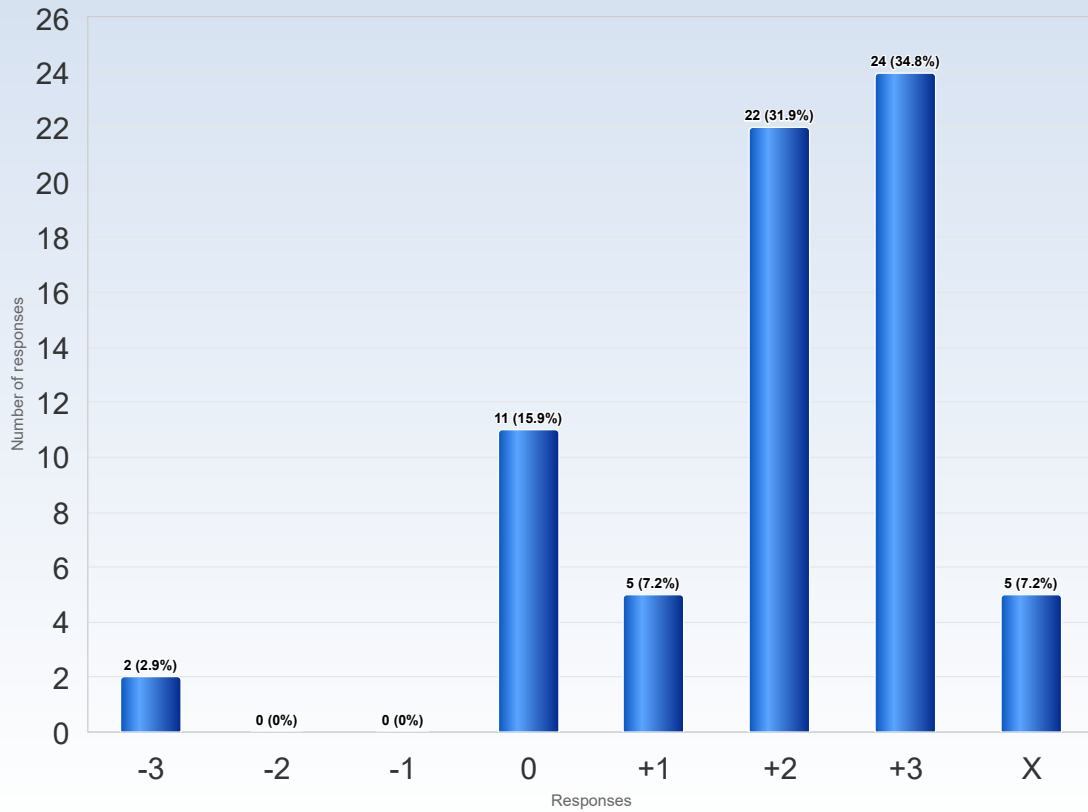
Comments (My response was: -3)

Only feedback was at the presentation and that felt very graded

Comments (My response was: +1)

Yes for the report but the feedback on the report is only after the presentation, It would have been better to get it before so that we could respond to the feedback

16. The assessment on the course was fair and honest



Comments

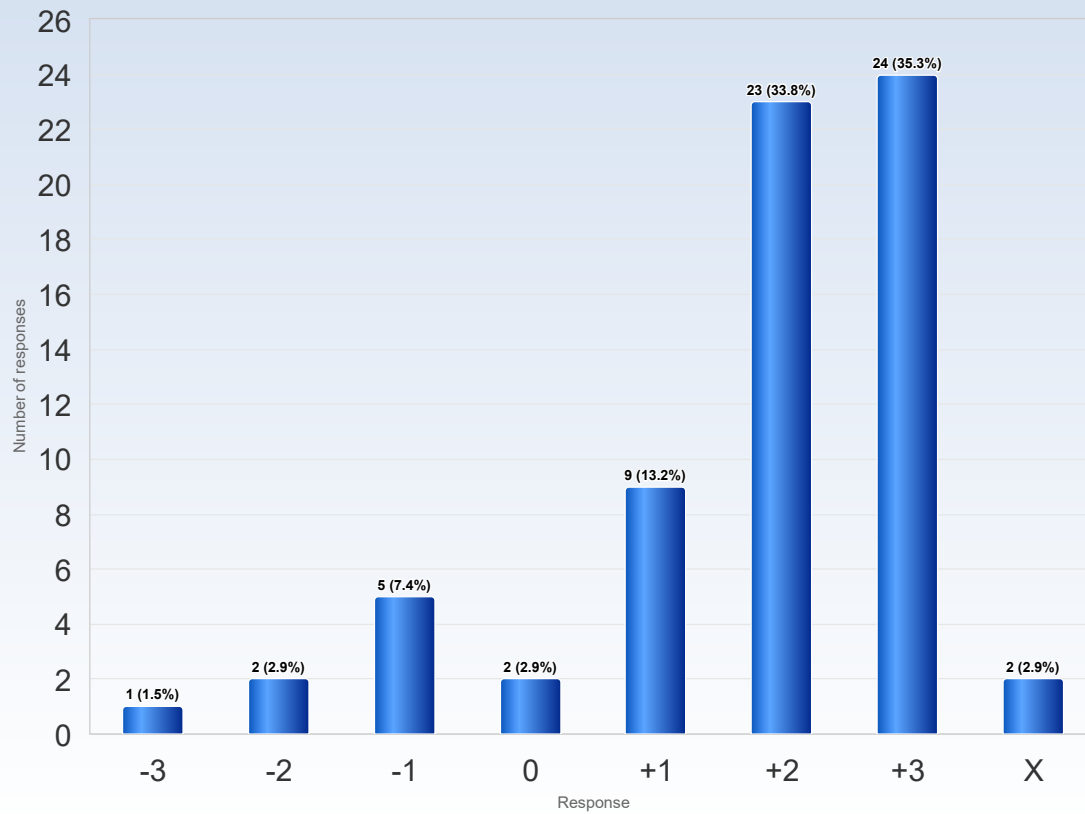
Comments (My response was: 0)

Did't really feel so! There were teams which did'nt do as much as we did, yet was not pointed out as much as we were

Comments (My response was: X)

We haven't received any assessment yet except the quiz which was pass fail.

17. My background knowledge was sufficient to follow the course



Comments

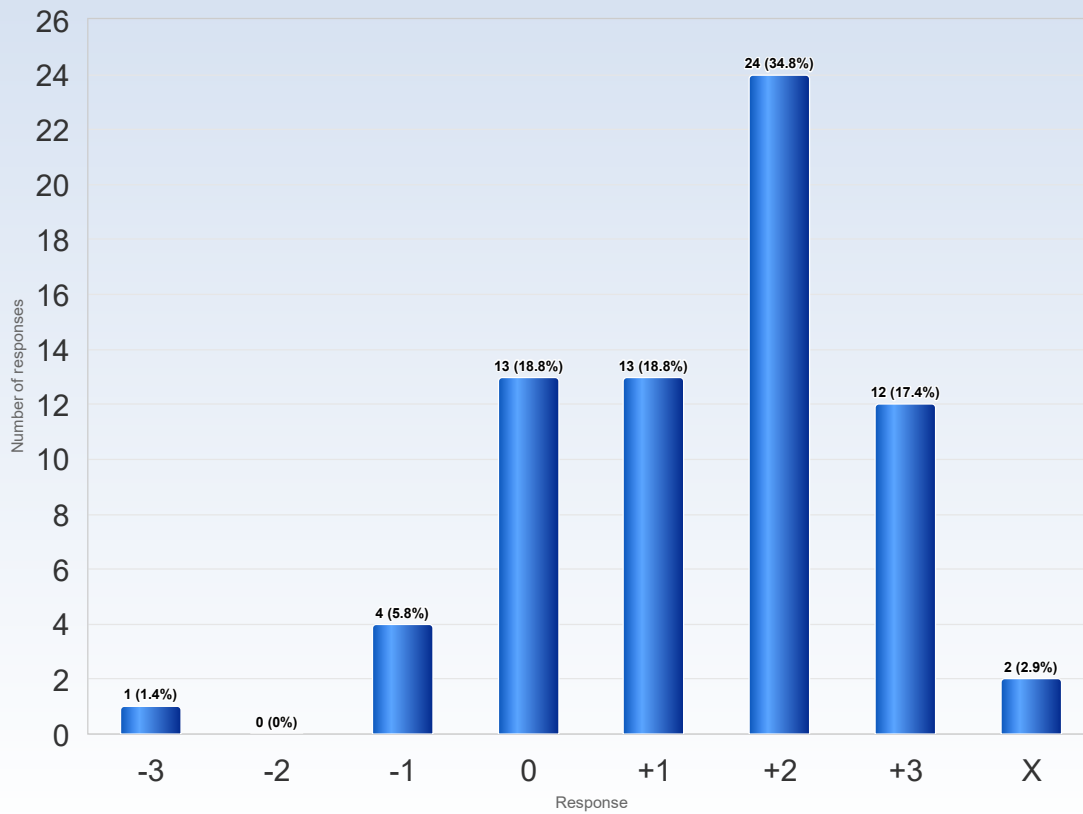
Comments (My response was: +3)

There was not much I needed as not much content was given to us

Comments (My response was: X)

Didn't need any background knowledge since there was basically nothing to learn in this course.

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



Comments

Comments (My response was: -1)

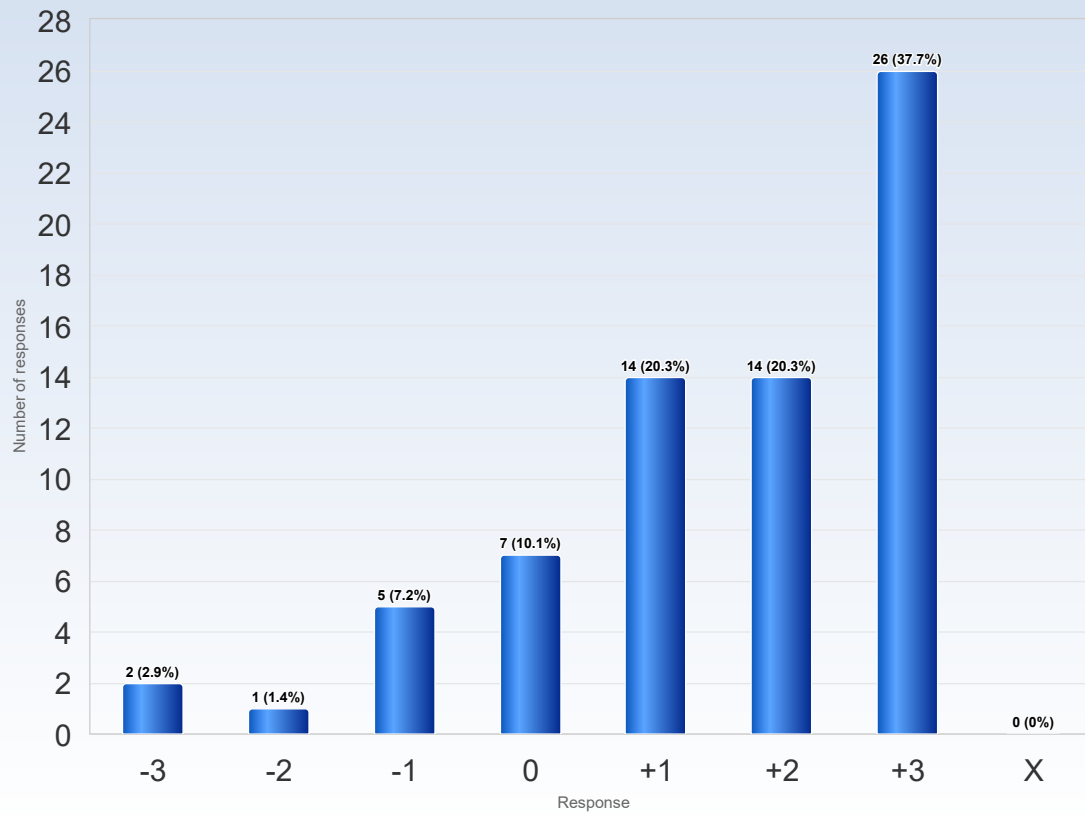
Don't think there is much information that I actually learnt which I would have had to revise

Comments (My response was: X)

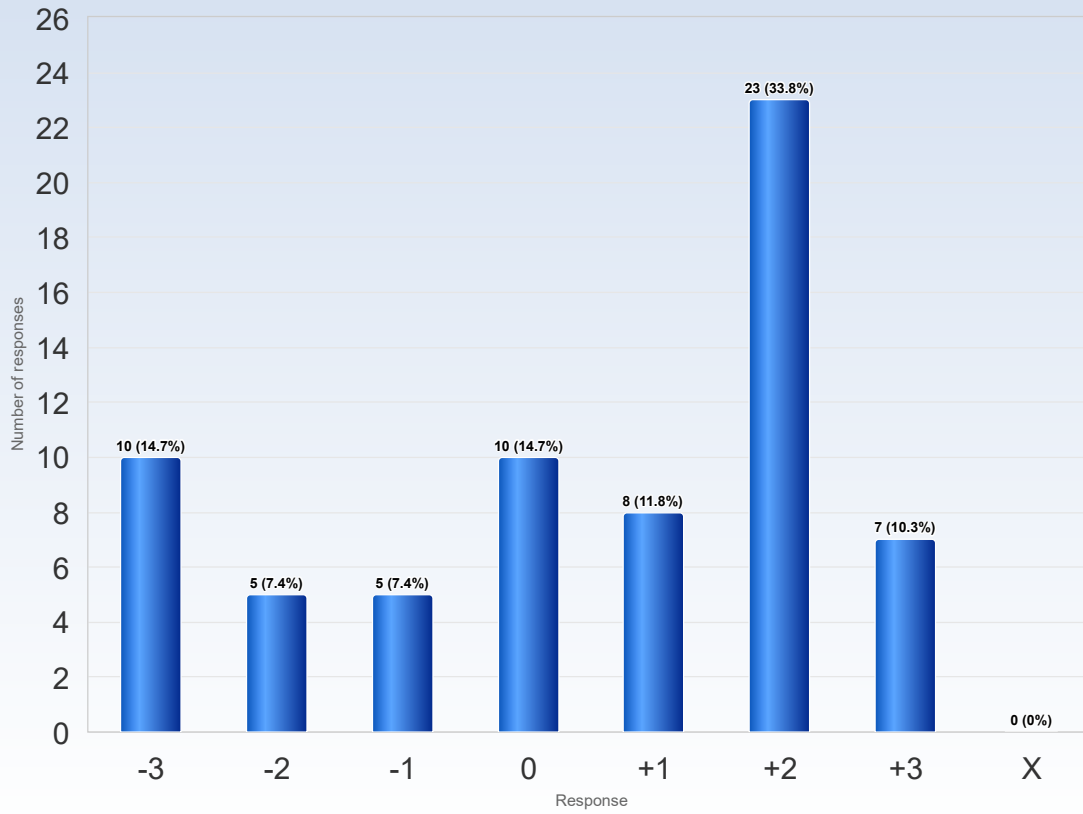
Could't do this much as I spent most of my time making the team understand the concepts although they ended up not understanding at the end.

Yes, but not because it was relevant. But because a lot of the contents didn't make logical sens.

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



20. I had opportunities to influence the course activities

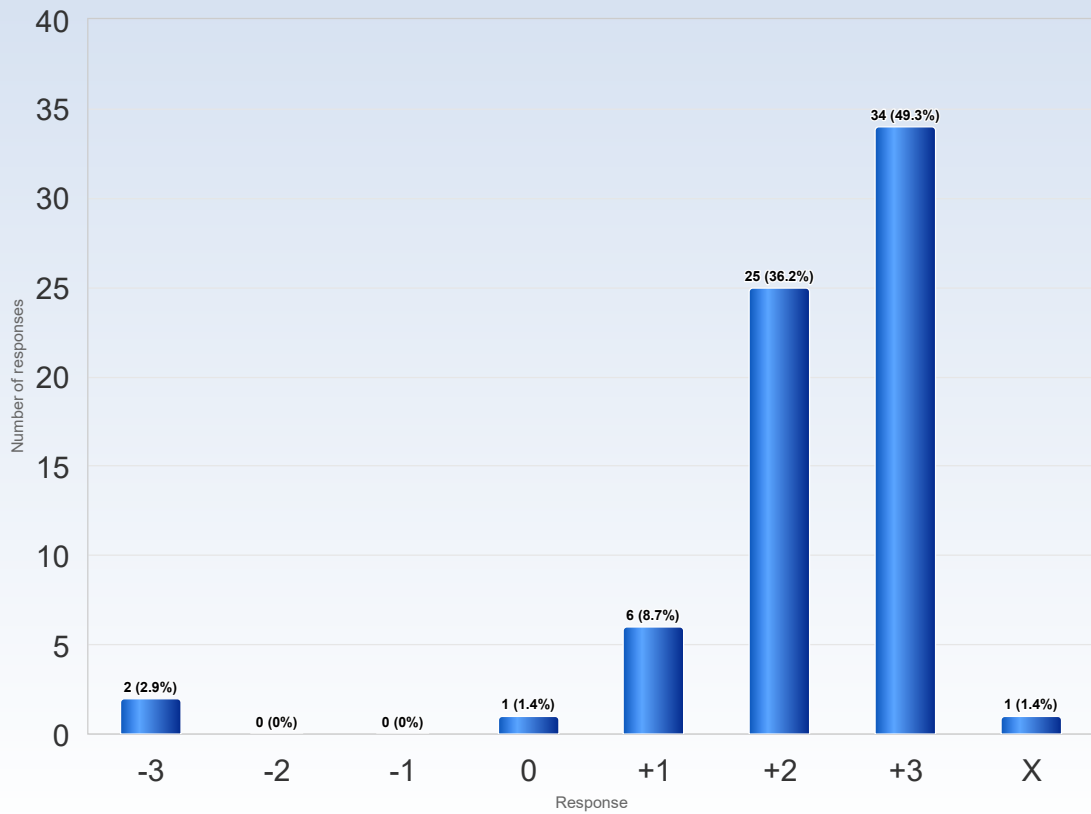


Comments

Comments (My response was: -1)

Could always bring questions but not much else

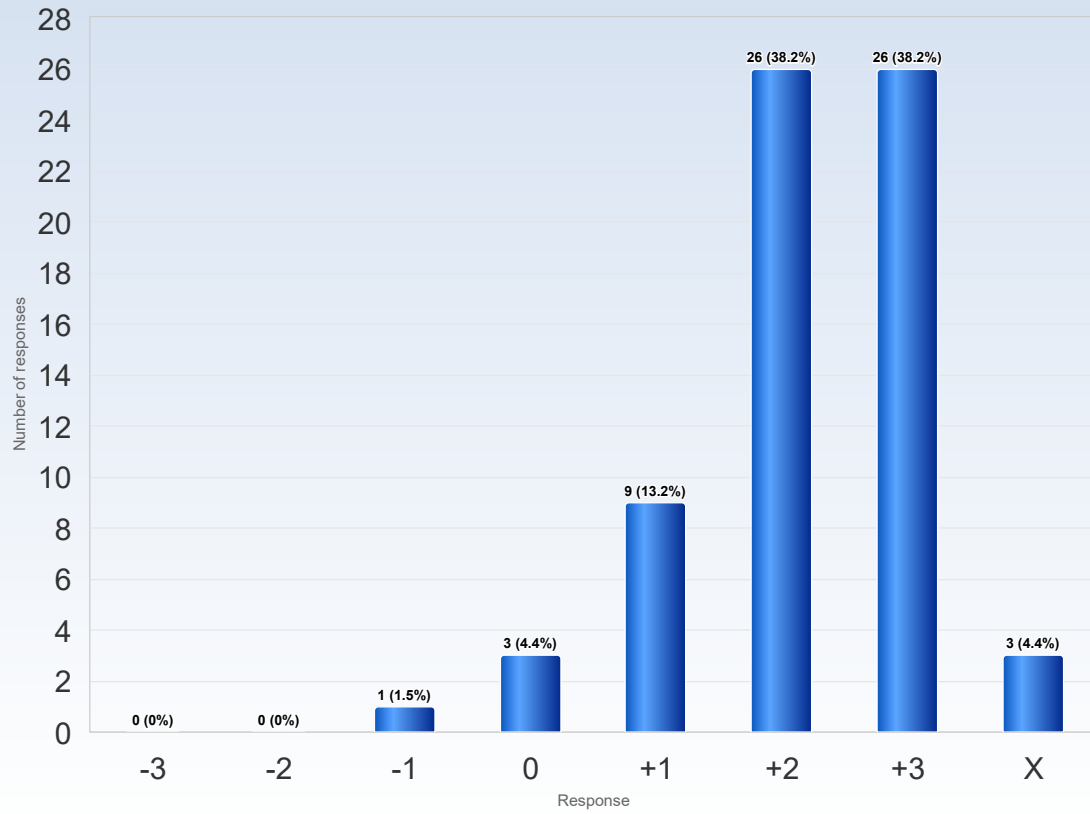
21. I was able to learn by collaborating and discussing with others



Comments

Comments (My response was: +3)
Team work was needed

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



Comments

Comments (My response was: -1)
No real help in the meetings
