

Report - DD2488 - 2022-06-21

Respondents: 1
Answer Count: 1
Answer Frequency: 100.00%

Please note that there is only one respondent to this form: the person that performs the course analysis.

Course analysis carried out by (name, e-mail):

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DESCRIPTION OF THE COURSE EVALUATION PROCESS

Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.

The course was evaluated using the Learning Experience Questionnaire (LEQ) created at KTH based on 12 statements and 4 general questions. Thus, all students have been given the possibility to give their opinions on the course. The questionnaire was open for responses from 2022-01-25 to 2022-02-07 and regular reminders were sent by the system.

Aspects regarding gender, and disabled students are investigated using a profile that students fill out in the questionnaire. Students had the possibility to disclose their gender but they didn't have to. They could comment on the course based on this perspective. Students also had the possibility to indicate whether they have some form of disability but they didn't have to. As with gender, students could comment on the course based on the perspective of their disability (if any).

The collected student profiles normally lead to additional data: the average response to LEQ statements per gender and the average response to LEQ statements per disability. However, this data is not generated if too few responses are received. In this case, no data was generated based on gender or disability due to this.

DESCRIPTION OF MEETINGS WITH STUDENTS

Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)

A course evaluation meeting was arranged after the course (on 22 February, 2022) when the course evaluation results were available. The participants of the course evaluation meeting consisted of the course responsible and examiner (myself), all TAs (Long Zhang and Mikhail Shcherbakov), and three student representatives (David Nadjar, Emil Jansson, and Olof Gren).

During the course evaluation meeting the course was reviewed based on the results of the course evaluation questionnaire, and based on the experience and feedback of the TAs and the student representatives. During the meeting, notes were collected which form another input to this course analysis.

COURSE DESIGN

Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.

The course consists of 12 lectures (2 hours each) as well as a sequence of 8 lab assignments (lab 0-7). Labs 0 and 1 are not graded, but students receive feedback during lab sessions. Labs 2-6 together constitute the course project (a compiler). The last lab 7 consists of an extension to the project that the students are free to choose (either from a list or an approved own proposal). Lab 7 also consists of a report that students have to write about their implemented extension.

Examination consists of 2 parts: (1) the course project and (2) the theory exam at the end of the course.

The main changes that have been implemented since the last course offering are:

(1) Lecture 12 (on Automatic memory management) was converted to a flipped classroom. Students were asked to self-study an introduction to the material before the lecture. The self-study preparation consisted of watching three short videos and reading parts of a Wikipedia article. Furthermore, the lecture began with a non-graded quiz and a Q&A session to ensure that the introduction to the material was clear and understood. In total, about 32 min. of lecture videos were recorded.

(2) In order to increase opportunities to learn by collaborating and discussing with others, students were encouraged to work on the labs and course project in groups of 2-3 members. However, to enable adequate individual assessment, each student had to present his lab work individually to a TA who asked questions about the solution.

THE STUDENTS' WORKLOAD

Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If there is a significant deviation from the expected, what can be the reason?

Given a total of 240 hours for this 9-credit course, and 16 weeks of study, the expected workload is about 15 hours per week. In the course meeting, the teaching assistants and myself agreed that the workload was overall close to the expected workload given the results of the course evaluation.

THE STUDENTS' RESULTS

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

Many students completed the course with good or very good success. There were no significant differences compared to previous course offerings.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

Several students mentioned that the labs with the compiler project were the best part of the course. ("To not only learn how to make a compiler, but to actually step-by-step construct one, which actually works.", "The labs. Doing every single one of them really deepened my knowledge of what a programming language is and how it is compiled and run.", "The appeal of working on something that feels like a real program is high. As a language nerd seeing more aspects of how to design programming languages is very interesting. The labs are fun, and challenging in a good way.", "The labs, which is also the main focus of this course. Building a compiler from scratch is a big challenge, but it surely builds students' ability of coding and boosting the understanding of a compiler.")

Students mentioned the following two main suggestions for improvement. Each of these suggestions was pointed out by more than one student:

- (1) To increase discussion and exchange of ideas between students, and to discuss different topics in groups with both teacher/TAs and students. This could be done using group discussions during lectures, or using discussion seminars.
- (2) More lab support sessions. An approach that is both practical and feasible could be to have twice as many lab sessions with half the length.

Some students provided particularly positive feedback in the open questions. Examples:

"It is a good course! I think this maybe is my favourite of all courses I have taken as part of my master's studies."

"Thank you for the course! It's sad that so few students take it, understanding how one's favorite language works should be common knowledge to all students."

SUMMARY OF STUDENTS' OPINIONS

Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

Overall, the average responses to the LEQ statements were very good or excellent. Students provided positive and constructive feedback in the open questions.

One area of improvement was identified (a) by students in answers to open questions, (b) by student representatives in the course evaluation meeting, and (c) by the results of the evaluation survey: the addition of group discussions to increase feedback and the exchange of ideas between students and teacher/TAs. Such group discussions would contribute to improving the lowest average response of the LEQ statements: number 21, "I was able to learn by collaborating and discussing with others."

In addition, it would be helpful to increase the number of lab support sessions, and shorten them.

OVERALL IMPRESSION

Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.

Overall, the students' evaluation matches their very good course grades. The second main change mentioned under "course design" might have contributed to an improvement from score 4.3 (HT20) to score 4.6 (HT21) regarding the LEQ statement "I was able to learn by collaborating and discussing with others." However, given students' feedback, this area, which is still the weakest in the course evaluation, should be developed further.

ANALYSIS

Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason for these be? Are there significant difference in experience between:

- students identifying as female and male?
 - international and national students?
 - students with or without disabilities?
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From the polar diagrams in the LEQ results, the following areas emerge as stronger areas: Stimulating tasks ("I worked with interesting issues"), Understanding of subject matter ("I was able to learn from concrete examples that I could relate to", "Understanding of key concepts had high priority"), Feedback and security ("The assessment on the course was fair and honest"), and Sufficient background knowledge ("My background knowledge was sufficient to follow the course").

I think that the area of Feedback and security is well supported by our cloud-based testing environment which lets students test milestones of the course project without being graded. The course project overall constitutes an important challenge to complete while being supported with a series of lab sessions and while being connected to the lectures.

As a weaker area we can identify the area of Collaboration ("I was able to learn by collaborating and discussing with others") with a score of 4.6, the lowest score in the polar diagrams. Potential reasons are (a) the fact that teaching in HT21 was still restricted due to Covid-19 providing students with fewer opportunities to meet and discuss, and (b) the fact that the course does not have group discussions or non-lab exercises done in groups.

The areas Challenge ("The course was challenging in a stimulating way") and Variation and participation ("The course activities enabled me to learn in different ways") received the second lowest score, 5.6. A promising way to address these weaknesses is to convert more lectures to a flipped classroom, and to develop active learning components.

PRIORITIZED COURSE DEVELOPMENT

What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?

In order to address the two main weaknesses identified in the above analysis, the following aspects should be developed primarily:

- (1) Strengthen the area of Collaboration by developing group discussions and/or exercises done in groups. This can be done in the short term, i.e., for the next course iteration.
 - (2) Convert more lectures to a flipped classroom, and develop active learning components. In the short term, one or two lectures can be converted. In the long term, all lectures should be given in the style of a flipped classroom.
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