Education Quality Processes at KTH EECS

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1 Introduction

The Head of the KTH School of Electrical Engineering and Computer Science (EECS) initiated an investigation focused on the quality of education as a continuation of the *Education portfolio 2025* investigation [4]. The directives included describing the current education quality processes at the school and within its departments and do a SWOT analysis of the quality processes; and then, based on this, propose improvements to the current education quality processes at the school.

The working group collected documents describing the education quality processes of KTH, at KTH's current schools, involved departments, and previous parts of EECS. We have also considered external sources such as Sweden's higher education legislation, the Swedish Higher Education Authority (UKÄ), and relevant European authorities (see Section 2). To collect data on the current education quality processes, attitudes to quality processes, and ideas for improvement, we distributed a survey to all EECS teachers[1] (see Appendix A). All of the collected material was analysed and condensed into a SWOT analysis (see Section 3). We then used the results of the survey and the SWOT analysis to recommend eight improvements in the education quality processes of EECS (see Section 4). Concluding remarks can be found in Section 5.

The result of the investigation has been presented at the school's Directors of Studies meeting (2020-03-05), the EECS quality council meeting (2020-03-11), and the Programme Directors meeting (2020-03-19). The results were also presented to the relevant chapters of the Student Union at KTH (THS) (2020-04-21). Finally, interested teachers were invited to review the findings.

2 Current status

There are regulations for quality and quality assurance (including quality enhancement) in higher education at the European, national, and KTH levels that have to be considered when defining quality assurance processes [2, 5, 6, 8].

UKÄ regularly reviews, for each Swedish higher education institution, that the quality assurance processes ensure high-quality education and support the quality enhancement. KTH was reviewed in 2019/2020 [12]. As part of this review, KTH made a self-assessment of its quality system [9]. Using this self-assessment's illustration of the communication flow in KTH's quality system as a starting point, and including information collected from the survey and the EECS delegation & rules of procedure [10], we have summarised the current quality processes from the perspective of EECS in Figure 1. Those processes shown in blue are fully in place while those shown in black exist in some part or parts of the school.

Since 2019, there is an assigned place in the KTH web for publication of course analyses (see Appendix B). Table 1 shows the number of published course analyses of courses given in 2019 per school. The table indicates that the majority of the courses lack published course analyses.

[1] In the rest of the document, we use the word *teacher* when we mean both EECS faculty and non-research teachers.

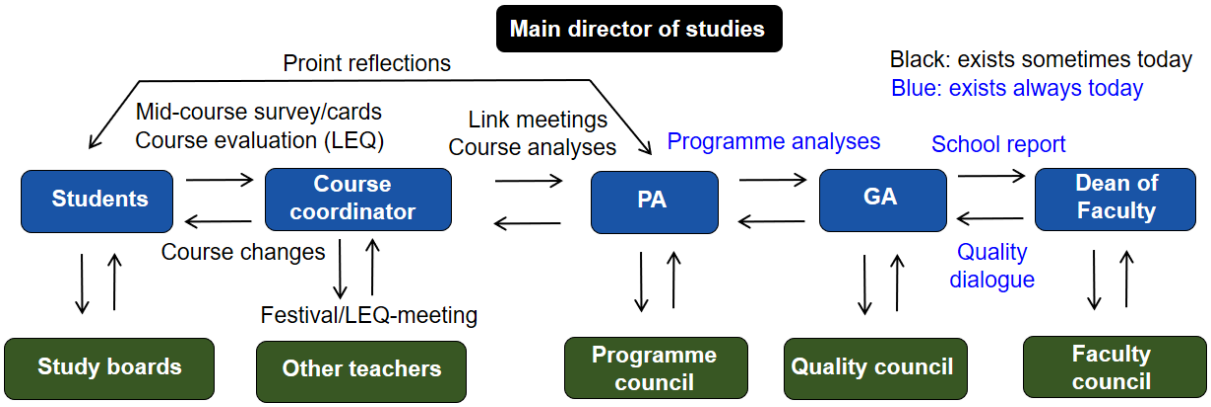

Figure 1: Current quality processes at EECS. In this figure, PA indicates a Programme Director, GA indicates the Director of 1st and 2nd cycle education.

School	Number of courses	Number of analyses	Percentage of courses analysed
ABE	660	67	10
CBH	457	47	10
EECS	716	59	8
ITM	702	37	5
SCI	614	90	15
Total	3149	300	10

Table 1: Number of published course analyses of 2019 KTH courses per school (as of April 29, 2020).

EECS is currently the only school within KTH with a course syllabus reviewing committee, see Appendix B. UKÄ's assessment board recommends KTH to implement such a group in every school as a part of the quality assurance system [12]. EECS can show other schools within KTH how this can be implemented.

3 SWOT

Strengths

The strength of EECS lies in its teachers:

S1 As the survey shows (e.g., in free-text responses on thoughts on quality assurance), EECS has many dedicated teachers who care about the quality of education. The teachers know their topics, and there are many good teachers who could help those who are struggling. EECS's teachers are familiar with policies about course evaluations and course analyses, and there are many good examples of quality assurance and enhancement efforts at the school.

Weaknesses

We identified the following issues related to the implementation of the education quality processes at EECS:

W1 According to the survey, both the responsibilities and roles in the quality assurance system are unclear, and the feedback links (from GA to PA to the teachers and courses, see Figure 1) are unspecified. For example, as indicated by Figures 7, 8 and 9, who follows up on courses or teachers with problems, and what the role of the Director of Studies is in the quality assurance processes, were unclear to survey participants.

W2 There is a lack of transparency; few course analyses are published correctly (see Table 1), and programme analyses are not published. The latter should be used by the school for quality enhancement.

W3 The course analysis documents are primarily intended to be a tool for quality improvement; but they are also used for quality assurance, although the course coordinator is clearly not neutral (see Figure 1).

W4 There is a large number of courses that are not associated with a single programme, and hence, not covered by the reporting in the education quality processes.

At the programme level, we identified the following issues:

W5 Situation awareness in the programmes needs to be improved. Some programmes are missing good ways of quickly identifying problems (e.g., using programme integrating courses, link meetings, see Appendix B), and many programmes lack student evaluations of the *whole* programme (Swedish: examensenkät).

At the course level, we identified the following issues:

W6 Resources for competence development and course development need to be improved. For example, there is a perceived lack of time and human resources for competence and course development (e.g., peer teaching and learning among teachers, as displayed in Figure 5), and competence development of teachers is neither planned nor monitored.

W7 Quality assurance within the courses can be improved. For example, feedback tools within the courses are seldom used (e.g., mid-course evaluation, see Appendix B); surveys suffer from low response rates (see Figure 11).

W8 Large courses and mandatory programme courses given by a single teacher make programmes vulnerable to under-performing teachers, illness of the teacher, etc..

Opportunities

O1 Deliverables produced in the KTH quality assurance system can be used *constructively* to improve the EECS quality assurance and enhancement processes.

O2 Existing good practices and tools (e.g., LEQ, the course analysis database, *Strömmingen*, *startenkäten*, *mellanårsenkäten*, *karriärenkäten*, course analysis festivals, the course syllabus committee, proint; see Appendix B) can be used more effectively for quality assurance and enhancement and be spread both within EECS and to the rest of KTH (see Figure 10).

Threats

T1 The reporting in the KTH quality assurance process might be perceived as unnecessary bureaucracy and require non-productive effort from Programme Directors and course coordinators. We see a risk that the time spent does not result in proportional benefit, and as a result, these tasks are not taken seriously.

T2 Lack of engagement in KTH-level activities (e.g., *storträffar*, PriU-groups, networking, pedagogical courses and seminars; see Appendix B) can lead to teachers feeling that they are isolated and that they lack influence in educational matters throughout KTH.

4 Recommendations

Suggestions for how to improve the quality processes at EECS have been collected from several sources [1, 4, 7] and the survey of EECS teachers. For each of these recommendations, we indicate if it primarily concerns quality assurance (QA), quality improvement (QI), or if it concerns both equally (QA&QI).

Recommendation 1: Clarified division of responsibilities (QA)

Problem: The division of responsibilities between PAs, Heads of Divisions, and Directors of Studies concerning education quality is unclear (see SWOT item W1; the roles of a Director of Studies as well as division and department heads are missing from Figure 1). Specifically, it is unclear: (i) who follows up course analyses and (ii) who should follow up and take actions when courses show deficiencies.

Recommendation: Create a formal document that defines the division of responsibilities in the quality processes. Such a document must clearly identify which roles have which responsibilities in terms of: (i) following up and giving feedback on course analysis, (ii) taking actions if courses have deficiencies, (iii) resource allocation, (iv) planning and leading recruitment of teachers, and (v) creating action plans for courses that need improvement. The document should be prepared jointly by the PAs, the Heads of Divisions, and the Directors of Studies. The GA is responsible that such a document is in place, communicated, implemented, and revised every year.

Motivation: Suggested by the EECS School assembly [11], the survey, and UKÄ (pages 30–31 in [12]).

Recommendation 2: Updating of skills (QI)

Problem: Many teachers stated that they do not have time for reflection nor time for updating their skills (SWOT item W6 and T2).

Recommendation: Introduce a compulsory part of the development talk between the teacher and the head of their division that focuses on updating of skills and allocate time for this. Before the development talk, the Head of Division and the Director of Studies should discuss each of the teachers, their performance, and required development. Time for reflection should be part of writing the course analysis, which is covered in recommendation 8.

Motivation: UKÄ stated: *There is a need to make it clear to the staff what opportunities exist for competence development, and what it means, and to ensure that time is set aside for it.* (page 11 in [12]). This was also suggested by the faculty's educational developers [1]. Will strengthen ESG standard 1.5 [2] and the Swedish Higher Education Ordinance (Högskoleförordning) (hereafter HF) Chapter 4, §12a [6].

Recommendation 3: Improved methods for course feedback (QI)

Problem: The problem is threefold: (i) very few course analyses are written and published, (ii) email-based course evaluations, such as LEQ, tend to give low response rates, and (iii) teachers get little feedback on their course analyses, which may result in little incentive to write the course analysis document in the first place (see SWOT items W2, W7, and W1, respectively, as well as T1).

Recommendation: We believe that (i) and (iii) are strongly related: if there is little incentive to write the document, few teachers will produce the document, even if it is formally required. Better incentives need to be established for why a teacher should write the document (besides the formal requirement). Examples of incentives include: (i) establishing best practices and introducing course analysis festivals in all divisions (see SWOT item O2 and Appendix B), (ii) make the course analyses available to the Head of Division and make it part of the annual development talk, (iii) introduce an economic incentive for the division to have available and high-quality course analyses. To address low response frequencies of LEQ, we recommend that more courses introduce mid-course evaluations, as has been done successfully in some courses. These course evaluations tend to give very high response rates, both because of their simplicity (simple papers are handed out and answered during lectures), and because of the incentive for the students as their comments may positively affect their current course offering, rather than only future course offerings (see Appendix B).

Motivation: UKÄ suggests: *KTH should continue to work to increase the response rate in the digital course evaluations (LEQ) and develop a system to integrate other methods for getting feedback from students* (page 19 in [12]). Will strengthen ESG standards 1.5 and 1.9 [2] and HF Chapter 1, §14 [6].

Recommendation 4: New quality assurance process for courses (QA)

Problem: The current quality processes at KTH suggests that the course analysis documents can be used for quality assurance (SWOT item W3). However, this is very problematic as the course analysis document is authored by the course coordinator, and consequently cannot be used as a quality assurance tool (as this person has a clear conflict of interest).

Recommendation: Introduce a new feedback channel from students to the management (PAs, Directors of Studies, Heads of Divisions, and GA) that has a high response rate and is performed independently of the course coordinator. Today, some programmes (CMETE, CELTE, and CDATE) collect different forms of course feedback as part of the programme integrating course. We recommend that (i) a procedure to collect written feedback is introduced in all programme integrating courses (see SWOT item W5) and (ii) that the feedback is aggregated, anonymised, and sent to the course coordinator, PA, Director of Studies, and the Head of Division. Note that this information should be used both in the annual development talk (recommendation 2) and as part of the action plan (recommendation 7). A common intended learning outcome must be established for all programmes, which requires writing course feedback as a learning activity[2]. For each course that is not taken by programme students, a similar, but course-specific procedure for collecting feedback from all students should be implemented, coordinated by someone other than the course coordinator. For such courses, a similar intended learning outcome has to be established[3].

We recommend developing a method for summarising and quantifying students experiences in each course, to make the student feedback more easily accessible. Eventually, this could provide a semi-objective way of recognising courses that are well received by students and could be officially acknowledged by the school management, to provide evidence of good pedagogical skills in the teachers' pedagogical portfolios.

Motivation: Suggested by the EECS School assembly and in the survey. UKÄ points out: *Program integrating courses give, according to the reviewers, 'important contributions to the quality enhancement of the programs'* (page 21 in [12]). Will strengthen ESG standards 1.3 and 1.9 [2]. SWOT item O1.

Recommendation 5: Teacher teams (QA&QI)

Problem: If only one teacher is responsible for a course (i.e., as the course coordinator), there are several potential problems (see SWOT item W8): (i) the teacher can become ill, (ii) the course is "owned" by a teacher in an unsound way, and (iii) it can result in stagnation if the course is not continuously improved.

Recommendation: We suggest that the school introduces compulsory *teacher teams* for all large compulsory courses. The Director of Studies and the Head of Department are responsible for ensuring that there are teacher teams in all these courses. Teacher teams also means that more people will be involved in writing and discussing the course analyses.

Motivation: Supported by the survey. Will strengthen ESG standards 1.3, 1.5, and 1.9 [2] and HF Chapter 4 §12a [6]. SWOT items S1 and O2.

[2]For example: *The student should be able to review critically and reflect on both the structure and implementation of their educational programme as well as their own study achievements.*

[3]For example: *The student should be able to review critically and reflect on both the structure and implementation of the course as well as their study achievements within and due to this course.*

Recommendation 6: Critical friends (QI)

Problem: Teachers get very little constructive feedback, except the feedback received from student course evaluations, such as LEQ (see SWOT item W1).

Recommendation: Introduce a new formal programme of *critical friends* [3]. There should be a small group of teachers who have a proven track record in successful teaching. Appointed members of this group evaluate courses and give constructive feedback to the course coordinator and the Examiner. Examples of activities include: visiting lectures, giving feedback on Canvas pages, reviewing examination structure and grading criteria, etc. It is important that the members of this critical friends group are compensated for their time. As not all courses can be evaluated in a given period of time, we suggest that priority should be given to cases where the course coordinator asks for feedback and when there is a severe problem with a course.

Motivation: Will strengthen ESG standard 1.5 [2]. SWOT items S1 and O2.

Recommendation 7: Procedure for formal action plans (QA)

Problem: If there are severe problems in a course or with the course coordinator, then there is a high risk that the problems are not solved the next year, and that the same issues occur year after year (see SWOT item W1).

Recommendation: We recommend a procedure for the Director of Studies to identify problems in courses (for example, recommendation 4) and to create a formal action plan together with the Head of Division. Examples of actions can be to have a *critical friends* evaluation or to move the teacher to another course. A copy of the plan must be sent to the quality council, who shall follow up the issue and the progress according to the action plan.

Motivation: Suggested by the faculty's educational developers [1]. Supported by the survey. Will strengthen ESG standards 1.3 and 1.9 [2].

Recommendation 8: Best practices fully implemented (QA&QI)

Problem: Link meetings are used in some programmes (W5), course analyses are published for some courses (W2), students are not always informed about the changes made in a course (W7), programme analyses are written but not generally communicated to the teachers in the programme (W2, T1), and the whole programme is not always evaluated by the students when they finish (W5).

Recommendation: Establish processes to ensure that all PAs regularly organise link meetings (with teachers, student representatives, and study counsellors), that all course coordinators publish a course analysis and inform students about changes made in the course that the student is about to take, and that all programme analyses are communicated to the relevant teachers. An exit survey should be sent to every student receiving a degree from KTH in one of the EECS programmes.

Motivation: As pointed out by UKÄ: *It is important to ensure systematic feedback to all students, doctoral students and staff.* The feedback to the students about the changes in the course since the previous course offering is a *central area of development to create participation and commitment* (page 19 and 25 in [12]). Supported by the survey. Will strengthen ESG standards 1.8 and 1.9 [2] and HF Chapter 1 §14 [6].

5 Conclusions

Although EECS has a quality process in place for education, it has some gaps and can be strengthened. This report contains 8 recommendations to improve quality at EECS, spanning from roles and responsibilities to teacher teams and action plans. If all recommendations are implemented, EECS would not only have a better set of quality processes, but also strengthen a culture of quality throughout the school. Figure 2 shows the actors, parties, and processes in the suggested quality system at EECS.

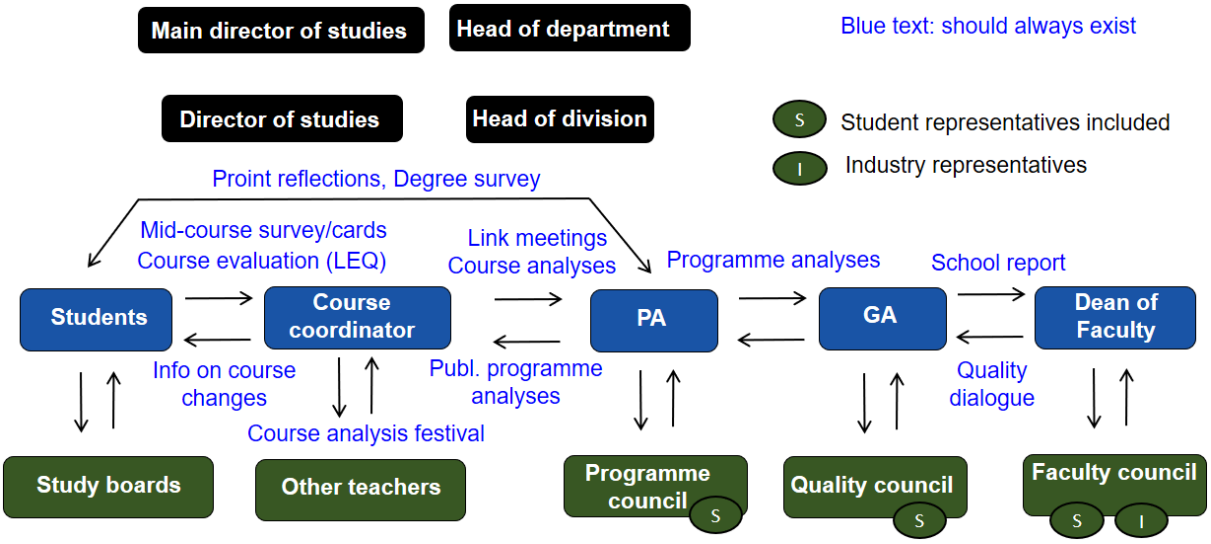

Figure 2: Suggested quality processes at EECS.

Acknowledgements

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References

[1] Khalid El Gaidi, Magnus Andersson, Viggo Kann, and Björn Kjellgren. Pedagogiska utvecklare vid KTH:s skolor 2014-2016. Technical report, KTH, 2016. https://www.kth.se/social/files/5ea5ea8663db82702d76dc05/pu-slutrapport-2016.pdf [Last accessed: April 26, 2020].

[2] ENQA. Standards and guidelines for quality assurance in the European higher education area (ESG). Technical report, European Association for Quality Assurance in Higher Education (ENQA) Brussels, 2015. Available from https://enqa.eu/index.php/home/esg/ [Last accessed: April 26, 2020].

[3] Gunnar Handal. Kritiske venner. *NyIng Rapport nr 9*, 1999.

[4] Markus Hidell, Benoit Baudry, Cristian Bogdan, David Broman, Hans Edin, Karl-Henrik Johansson, Hedvig Kjellström, Marianne Lundin, Linda Barman, Jacob Cederlund, and Simone Stefani. EECS education portfolio 2025, final report. Technical report, KTH, 2018.

[5] Högskolelag (1992:1434). Available from https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/hogskolelag-19921434_sfs-1992-1434 [Last accessed: April 26, 2020], 1992–2019.

[6] Högskoleförordning (1993:100). Available from https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/hogskoleforordning-1993100_sfs-1993-100 [Last accessed: April 26, 2020], 1993–2019.

[7] Viggo Kann. Programme integrating courses making engineering students reflect. In Kehdinga George Fomunyam, editor, *Theorizing STEM Education in the 21st Century*. IntechOpen, 2019. Available from https://www.intechopen.com/books/theorizing-stem-education-in-the-21st-century/programme-integrating-courses-making-engineering-students-reflect [Last accessed: April 26, 2020].

[8] KTH. Kvalitetspolicy. Available from https://intra.kth.se/styrning/kvalitetsarbete [Last accessed: April 26, 2020], 2019.

[9] KTH. Universitetskanslersämbetets granskning av lärosätenas kvalitetssäkringsarbete – Självvärdering KTH Kungliga Tekniska högskolan. Technical report, KTH, 2019. Available from https://www.uka.se/kvalitet--examenstillstand/resultat-fran-granskningarna-hogskolekollen/hogskolekollen.html?url=427238778%2Futvardering%2F1949217%2Fkomplett-underlag&sv.url=12.794d1f901621e65b329c27f [Last accessed: April 26, 2020].

[10] KTH EECS. EECS School's delegation and rules of procedure. Available from https://intra.kth.se/eecs/dokument/strategiska-dokument-for-eecs [Last accessed: April 26, 2020], 2020.

[11] KTH EECS School Assembly. Email communication, 2019.

[12] UKÄ. Granskning av kvalitetssäkringsarbetet vid Kungliga Tekniska högskolan. Available from https://www.uka.se/kvalitet--examenstillstand/resultat-fran-granskningarna-hogskolekollen/hogskolekollen.html?url=427238778%2Futvardering%2F1949217%2Fkomplett-underlag&sv.url=12.794d1f901621e65b329c27f [Last accessed: April 26, 2020], 2020.

A Appendix: Survey on current quality processes

To gather additional data for our working group, we conducted a survey to ask EECS teachers about the current quality processes in the 1st and 2nd cycle education at EECS and their suggestions for improvements.

A.1 Data collection and participants

We collected responses between 16th of December 2019 and 16th of January 2020 through the EECS teachers mailing list. The survey began with a common set of questions related to quality assurance and improvement, as well as existing quality processes (e.g., course analyses) and respective feedback. After the generic questions, we asked additional questions depending on the respondents' main role (Teacher, PA, Director of Studies, the Head of Division, or EECS Management).

A total of 88 participants took part in the survey from all the EECS divisions (see Figure 3). Participants had different roles within EECS: 69 teachers, 8 PAs, 4 Directors of Studies, 5 Heads of Division, and 2 participants from EECS management, as shown in Figure 4.

A.2 Summary of results

In this section, we highlight some of the multiple choice and open ended answers that are most relevant to understand the analysis and recommendations of this report. All the survey answers are available upon request.

One of the most surprising findings of the survey, that actually originated our first recommendation, was that the responsibilities for education quality are often unclear. For example, when asked about who should follow up on a course analysis that shows deficiencies, PAs, Directors of Studies, and Heads of Division had divergent opinions (see Figures 7, 8 and 9).

More than half of the participants considered that more preparation/reflection time, as well as more human resources (e.g. more TAs and multiple teachers per course), are among the most important means to improve the quality of education (see Figure 5). This finding contributed to the second recommendation.

A specific problem we aim to address with the third recommendation is the low response rate for course evaluations such as LEQ. While many teachers showed appreciation of existing streamlined course evaluation methods (such as the LEQ), also some challenges were reported. For example, 78 percent of the participants considered the low student response rate as one of the main challenges in gathering student feedback, as Figure 11 shows. Another frequent comment in the open-ended answers was that teachers receive little feedback on their course analyses, with some teachers highlighting the existing forms of feedback: "*I appreciate the support that is provided for creating course evaluations and course analyses. I think this really helps in streamlining the process, and enables teachers to focus on the actual course analysis and improvement. The course analysis festivals we have had at TCS help teachers get insights into courses by their colleagues which helps ensuring the coherence of a program.*"

Our recommendations 5 and 6 were partly supported by the survey results, for example, by the question about "How can the (minimum) quality level of each EECS course be assured". Here, most teachers (55 out of 88) selected the option of having "teacher teams taking collective responsibility for a group of courses" as one of their top 3 choices (see Figure 6). Support from other teachers to improve quality was also often suggested by participants in the open-ended questions: "*Take care of lower-quality courses by talking to these teachers and develop an action plan together.*"

Some of the concrete actions proposed in recommendation 7 were based on the most frequent answers to the question on how to ensure the quality of education. These include, for example, an action plan for courses that do not reach the minimum quality level, which was considered relevant by 50 out of the 88 participants.

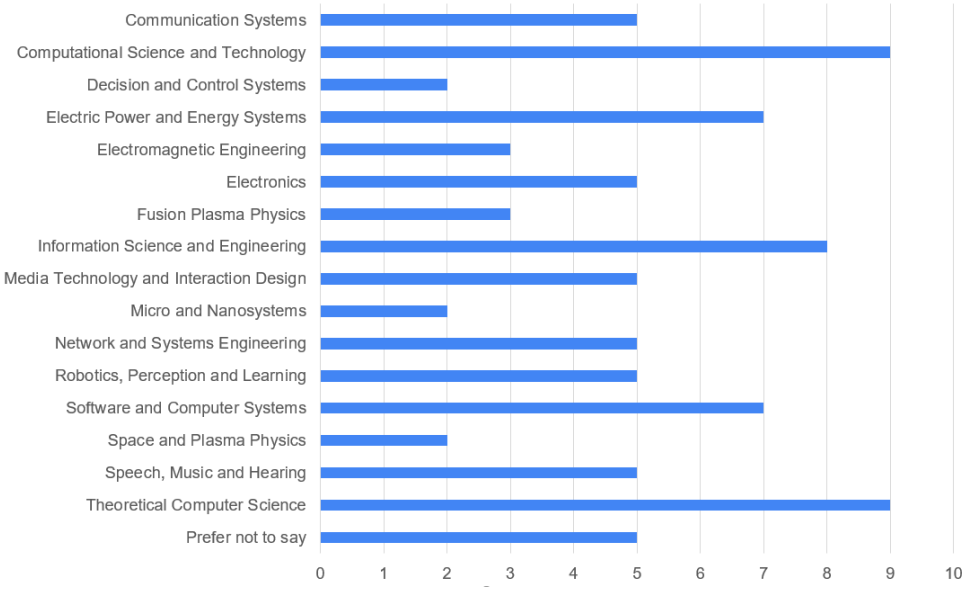

Figure 3: Number of responses per division ($N = 88$).

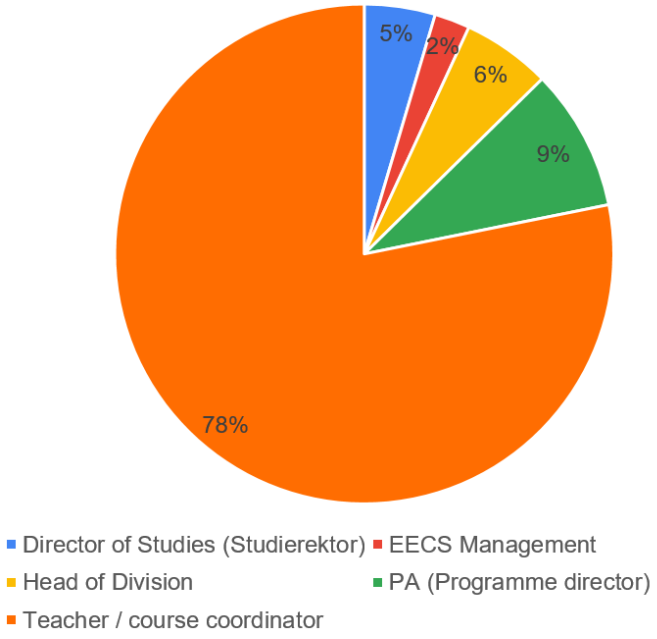

Figure 4: Role of respondents within EECS ($N = 88$).

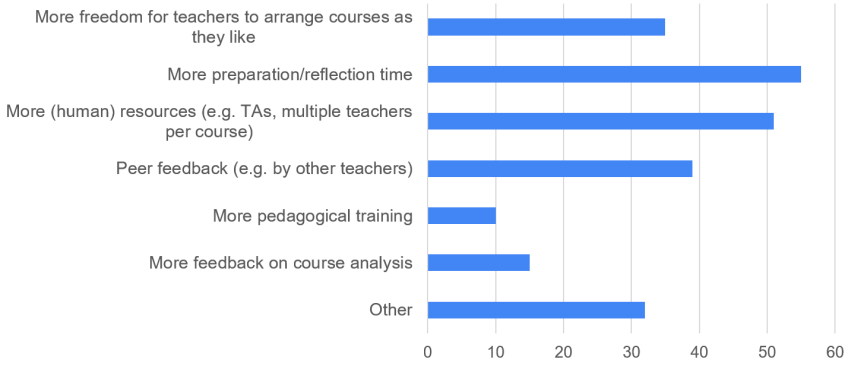

Figure 5: Answers to the question “How can the general quality of education at EECS be enhanced?” ($N = 88$, multiple choice up to 3 options)

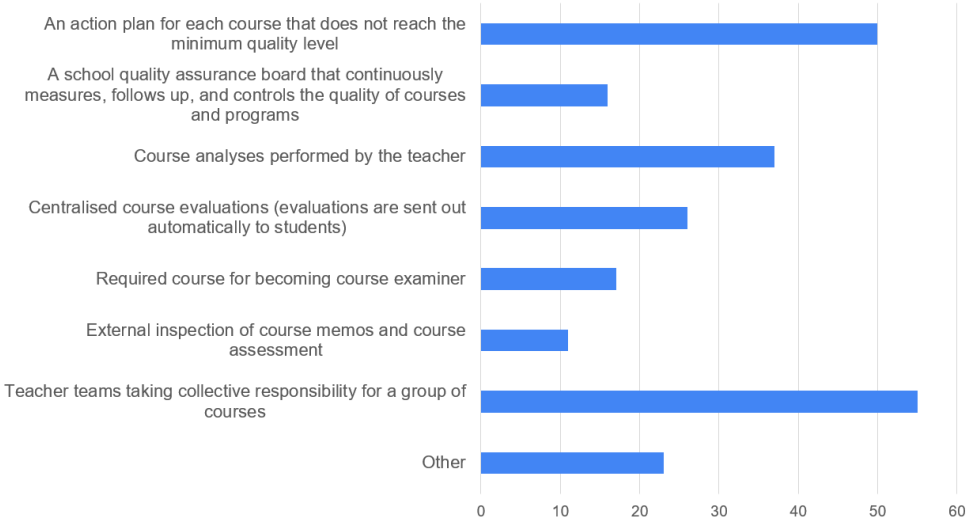

Figure 6: Answers to the question "How can the (minimum) quality level of each EECS course be assured?" ($N = 88$, multiple choice)

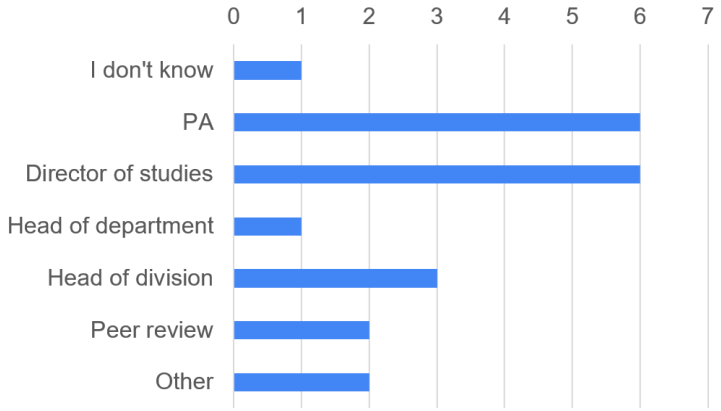

Figure 7: Answers from PAs ($N = 8$) to the multiple choice question "Who should follow up on course analyses that show deficits?"

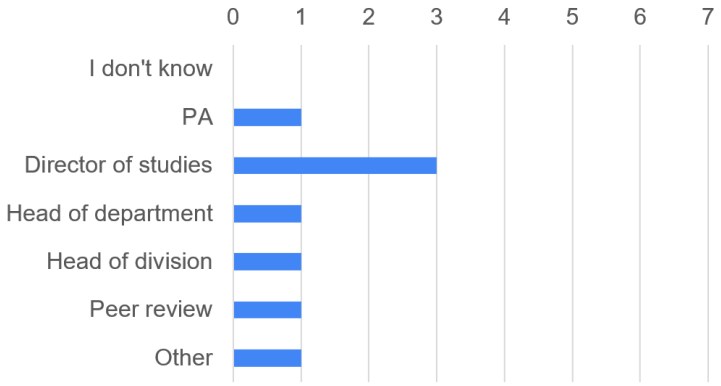

Figure 8: Answers from Directors of Studies ($N = 4$) to the multiple choice question "Who should follow up on course analyses that show deficits?"

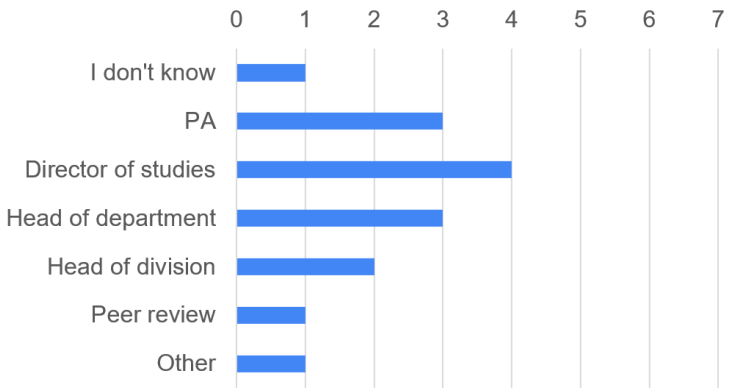

Figure 9: Answers from Heads of Divisions ($N = 2$) to the multiple choice question “Who should follow up on course analyses that show deficits?”

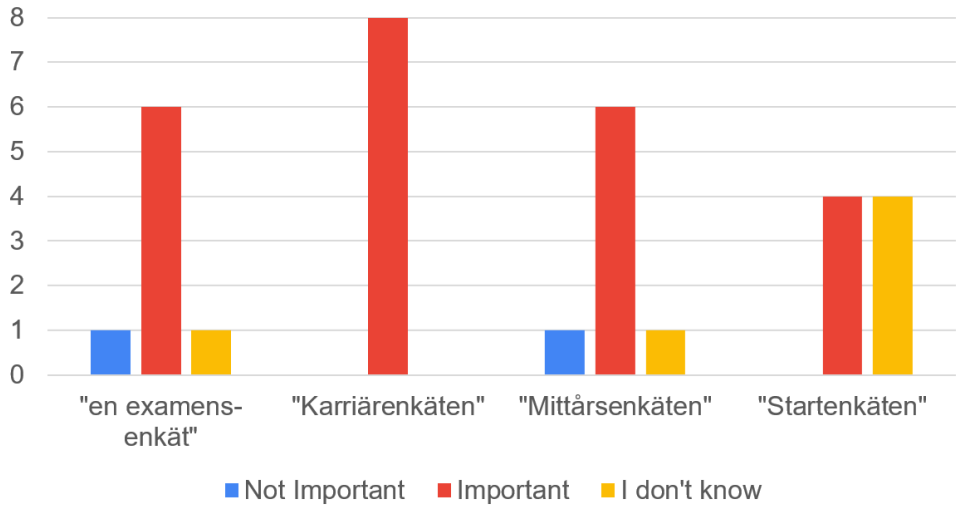

Figure 10: Answers from PAs ($N = 8$) to the question “Which other sources of information (beyond course analyses and quantitative data) are/would be important for writing the programme analysis?”

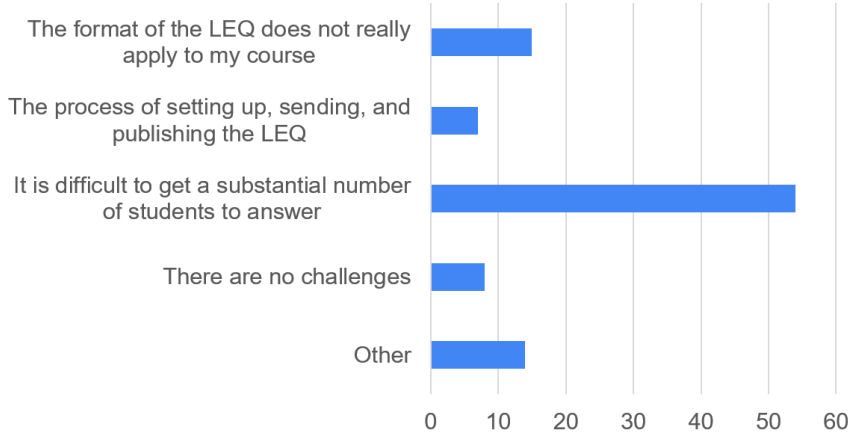

Figure 11: Answers to the question “What are the main challenges in getting student feedback through the Learning Experience Questionnaire (LEQ)?” ($N = 88$, multiple choice)

B Appendix: Examples of good practices, tools, and activities

B.1 Mid-course and battery evaluations

A simple mid-course evaluation approach, called *battery evaluation*, has successfully been used for several years in the courses IS1200 and IS1500. The evaluation works as follows. During one of the lectures, before the break, small (approximately A6 size) cards are handed out to all students. The students divide these cards into two columns and mark the columns with a plus (+) sign and a minus (-) sign, respectively[4]. Each student writes anonymously what they think works well in the course (+), and what needs to be improved (-). At the next lecture, the teacher gives a summary of the findings, and tells the students in what way the course will be improved or why it is not possible to address some of the problems in the current instance of the course. This approach has been greatly appreciated by students because this student feedback can improve their course, rather than only future course offerings.

B.2 Learning Experience Questionnaire (LEQ)

The Learning Experience Questionnaire (LEQ) is an evidence-based tool for examining students' learning experience, developed at KTH[5]. This tool is available for each course coordinator, and they can customise the questions for their course.

B.3 Course analysis database

In 2019, KTH developed a central course analysis database into which each course analysis produced at KTH should be uploaded. These course analyses are publicly available through the KTH course catalogue[6].

B.4 Strömmingen

Monika Lundell, an educational developer at EECS, has developed a computer system called *Strömmingen*, that automatically analyses a student's performance in all courses and computes which courses remain to be taken for the student to receive a degree.

B.5 KTH questionnaires to students and alumni

KTH regularly (typically every third year) carries out three large surveys using questionnaires:

- *Startenkäten* to all students starting year 1
- *Mellanårsenkäten* to all students in the middle of their education
- *Karriärenkäten* to all alumni, about 2 years after they completed their degree

These questionnaires are analysed by Statistics Sweden (SCB) and the results are presented both summarised and programme-wise[7].

B.6 Course analysis festivals

The course analysis festival has been a recurring event since 2016 at the Divisions of Theoretical Computer Science and Computational Science & Technology. During this two-day event, every teacher who has produced a course analysis of a course given during the last academic year will meet colleagues in groups of 3 or 4 teachers and discuss their course analyses.

B.7 The course syllabus reviewing committee

In 2018, the GA at EECS, as suggested by the faculty's educational developers [1], established a group for reviewing all new and revised course syllabuses at EECS. Each course syllabus has to be reviewed by the course syllabus reviewing committee before the GA will approve it. This committee consists of two Directors of Studies, two educational administrative officers, and two student representatives.

B.8 Programme integrating courses (proint)

Ten years ago, programme integrating (proint) courses were developed at the master of science in engineering programmes media technology and computer science & engineering at EECS (then CSC). Proint is a special type of course, lasting for several academic years and aiming to strengthen programme coherence, by tying the students, teachers, and Programme Director closer together [7]. These courses consist mainly of reflection seminars (four times a year). Before each seminar, each student writes a reflection document, reflecting, among other things, on their own studies and the

[4] The reason for calling it a battery evaluation is because the paper looks like a battery with plus and minus terminals. Previously, we used the term Muddy cards, but this term was used at other universities with a different meaning.

[5] See `https://intra.kth.se/en/utbildning/utveckling-och-hogskolepedagogik/stodmaterial/sca/leq`

[6] See `https://www.kth.se/student/kurser/sokkurs?l=en`

[7] See `https://intra.kth.se/styrning/utbildning/enkater`

courses that they are currently taking. Today, many programmes at and outside of EECS have started such courses.

B.9 Link meetings

Link meetings are regular meetings in a programme, where the programme director and the study counsellor meet the course coordinators and student representatives of the currently active courses, to coordinate the courses and discuss problems.

B.10 KTH arenas and collegial networks

KTH organises large meetings (Storträffar) on educational development twice a year. All teachers, staff, student representatives, and the KTH management are invited. Between these meetings, interested teachers and staff members work in topic specific groups (PriU groups) focused on specific prioritised topics on educational development, such as digitalisation, internationalisation, sustainability, physical premises and planning, and equality[8]. There are also monthly meetings of KTH-wide networks of Programme Directors and Directors of Studies.

B.11 Courses in teaching and learning in higher education

KTH offers an extensive range of courses in teaching and learning, aimed at active KTH teachers[9].

B.12 EECS pedagogical seminars

Several times each semester, EECS organises pedagogical seminars on topics of interest for the school's teachers.

[8] See `https://www.kth.se/social/group/prioriterade-fragor-/`

[9] See `https://intra.kth.se/en/utbildning/utveckling-och-hogskolepedagogik/hogskolepedagogik/kurser`