IT-FAKULTETEN

IT-fakultetens kansli
Cecilia Ihse
Kanslichef
Tel: 031-786 9037
Cecilia.Ihse@itfak.gu.se

PM

Datum:	Dnr:	Mottagare:
2022-10-18	GU 2021/1148	IT-fakultetsstyrelsen

Utbildningsutvärdering med extern bedömning av utbildning på forskarnivå vid Institutionen för data- och informationsteknik – externa bedömargruppens rapport

I enlighet med Göteborgs universitets *Policy för kvalitetssäkring och kvalitetsutveckling av utbildning vid Göteborgs universitet* ska IT-fakulteten genomföra utbildningsutvärdering med extern bedömning. Utbildningsutvärderingar med extern bedömning bidrar till att utveckla universitetets utbildningar och den externa bedömningen utvärderar hur det interna kvalitetsarbetet fungerar och om de motsvarar de kriterier som finns i universitetets policy.

IT-fakultetsstyrelsen beslutade 2017 att utbildning på forskarnivå vid Institutionen för data- och informationsteknik skulle utvärderas läsåret 2021/2022. Styrelsen beslutade då också att utvärdering av utbildning på forskarnivå skulle ske samlat per institution vid ett tillfälle under innevarande utvärderingscykel.

Utbildningsutvärdering med extern bedömning av utbildning på forskarnivå vid institutionen för data- och informationsteknik

Under hösten 2021 inleddes således processen för att utvärdera forskarutbildningen vid Institutionen för data- och informationsteknik med hjälp av en extern bedömargrupp. Institutionen samlade in relevant underlag och föreslog bedömare till den externa bedömargruppen. IT-fakultetsstyrelsen beslutade om den externa bedömargruppen den 15 september 2021 och kort därefter inledde gruppen sitt arbete. Den 21–22 april 2022 genomförde bedömargruppen ett platsbesök för intervjuer med ledning, handledare, doktorander, alumni och verksamhetsstöd. Det skedde också en återkoppling till fakultetsledningen av gruppens intryck från besöket. Den 3 oktober 2022 mottog IT-fakulteten den externa bedömargruppens rapport *External review of third-cycle studies at Department of Computer Science and Engineering, IT-faculty, University of Gothenburg*. Rapporten bifogas

denna PM. Rapporten presenteras av viceprefekt för utbildning på forskarnivå vid Institutionen för data- och informationsteknik vid IT-fakultetsstyrelsens sammanträde den 26 oktober 2022.

Fortsatt process

På basis av bedömargruppens utlåtanden och rekommendationer tar institutionen fram en utvecklingsplan/åtgärdsplan som presenteras vid IT-fakultetsstyrelsens sammanträde den 22 februari 2023. Planen följs upp kommande år 2024.

Enligt uppdrag
Cecilia Ihse, kanslichef

External review of third-cycle studies at Department of Computer Science and Engineering, IT-faculty, University of Gothenburg

Jan Gulliksen, professor in Human Computer Interaction, KTH Royal Institute of Technology, (chair of the evaluation committee), mailto:gulliksen@kth.se
Olaf Owe, University of Oslo, mailto:olaf@ifi.uio.no
Ingela Dahllöf, Göteborgs universitet, mailto:ingela.dahllof@bioenv.gu.se
Elin Malmgren, PhD student at Mekanik och maritima vetenskaper, avdelningen för maritima studier. mailto:elin.malmgren@chalmers.se

Task to the evaluation committee

The overall task of the external assessment committee is to examine the academic and pedagogical quality of postgraduate education and its relevance to students and society. This review has taken place on the basis of the evaluation criteria given in the policy. The assessment committee has assessed whether the program meets these criteria and summarizes in this assessment statement what needs to be developed for the doctoral program to meet the criteria.

The collegial form of evaluation and the assessment committee's overall recommendations are expected to contribute to long-term quality development and quality assurance of the department's postgraduate education. The external assessment committee has contributed to this work with their different perspectives. The IT faculty is then responsible for ensuring that measures are taken on the basis of the evaluation and that the measures are followed up.

Review criteria

The panel has reviewed whether the provided education meets the following criteria:

- Achieved study results match intended learning outcomes and the qualitative targets of the Higher Education Ordinance.
- Teaching is focused on student/doctoral-centered learning.
- The content and form of teaching rests on scientific and/or artistic bases and proven experience.
- Teachers have up-to-date and adequate competence as regards their subjects and teaching and learning in higher education, and the numbers of teachers are in proportion to the scope and content of study courses and programmes.
- Study courses and programmes are relevant to the needs of the students/doctoral students and society.
- Students/doctoral students have influence in planning, implementing and monitoring study courses and programmes.
- The study and learning environment is accessible and purpose-oriented for all students/doctoral students.
- The study courses and programmes are continuously monitored and developed.

In addition, the panel was asked to consider the goals of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) https://www.eqar.eu/kb/esg/

Furthermore, the panel was informed about the outcome of an internal workshop conducted in January 2021, and made aware of four focus areas where there may be a need for improvements, namely

- gender equality perspective
- recruitment and admission
- courses
- information

Evaluation

The Department of Computer Science and Engineering (CSE) at the University of Gothenburg (GU) seems to have a well-functioning PhD education that staff, students and alumni are very happy and proud about. We can only congratulate you on having managed to create such a successful environment and PhD education. The students expressed that they particularly were very happy about the practical applicability of their research and the fact that they could go on internships to companies and other national or international organizations. This has proven to be great for getting connections and networks, particularly when the PhD is about to finish. However, the PhD education may be improved further in several respects.

In the following we will go through and address the specific review criteria as per the instruction and particularly describe our observations and recommendation on work environment, gender equality and HR matter. We understand the terms “teaching” and “learning” used in the criteria in a wide sense, including supervision and PhD related research. We will go through particular issues and concerns raised during the reading of the self-evaluation documents and issues discussed during the site visit 21-22 April 2022, including meetings with the administration, leaders of the faculty, of the institution, and of the PhD support team at CSE, as well as selections of supervisors, PhD students, and alumni.

Overall observations

There seem to be some confusions from both staff and PhD students over what routines and regulations that refer to GU and what refer to Chalmers, leading to differences in routines, conditions, public image and structures. There is a great potential in streamlining this so that the same processes and regulations apply both for GU and Chalmers.

Quality and processes to assure the quality

The Department of Computer Science and Engineering (CSE) at the University of Gothenburg has a solid quality assurance system, but the weakest point is often the action plans and the follow-up. We recommend that care is taken to ensure that there are named persons to handle each part of your coming action plan and deadlines for the activities. Having seen the action plan for gender equality we would stress that actions must be more tangible than those presented there.

The doctoral students have access to an active research environment with sufficient subject depth, subject width and scope

An important basis for a PhD education of high quality is the connection to a vivid research environment of sufficient quality, funding, ongoing projects, a good track-record of

publications, a critical mass of researchers and a coherent strategy for the development. The research environment at the Department of Computer Science and Engineering at the University of Gothenburg is in many aspects strong with nationally recognized to world leading research groups that are well funded. However, there are groups that are under-critical in size and research funding which clearly can be seen from the number of PhD students that they have currently on-going and have graduated over the years. This has definitely an impact on the quality of the PhD education. Few PhD students do not give sufficient room to develop as a PhD student and to grow and thrive.

As mentioned, there is a large number of research groups in several areas of high international standard. This means that many of the PhD students are part of an active research group. However, in some cases the PhD student relies on the supervisor(s), also in matters not strictly concerning the PhD project. It seems that inclusion of a PhD student in a wider research network would be helpful, especially with respect to breadth and independence of the student.

Strong recommendations:

- **Research strategy –** Make sure to develop the research strategy and the research environment to foster the opportunity to manage a high-quality PhD education.
- **Critical mass in all subject areas –** If a particular research environment or PhD subject does have the prospects to meet a critical mass, consider reorganizing to give the PhD students a rich and diverse enough environment to prosper and thrive in.

Recommendations:

- **Collaboration for exchange –** Consider collaborations with other successful research environments to give the PhD students the required network and access to relevant PhD courses for the PhD students to be able to develop.

The content and form of teaching rests on scientific and/or artistic bases and proven experience.

There are a large number of research groups at Chalmers and GU at a high international standard, and as a large part of the PhD students (especially at Chalmers) are externally funded as part of successful research applications, this guarantees that the PhD projects are of high quality. It also means that PhD students may be required to have a solid background from prior education or experience.

Strong recommendation:

- **Exchanging supervisory experiences –** Ensure that successful groups and supervisors share their experiences and knowledge with all groups, in particular small and upcoming groups.

Students/doctoral students have influence in planning, implementing and monitoring study courses and programmes.

We were happy to find an environment where most of the PhD students appeared to have a direct influence over the content of their PhD programme. The current structure and routines are clear and useful to facilitate the PhD students' direct involvement in planning and reviewing their PhD course curriculum. It is important to maintain a culture where the qualitative aspects behind the requirements and the structure, such as number of papers or course credits, does not overshadow the actual learning aspect of the education.

The information flow and planning opportunities appear to be scattered today. The online information on the PhD studies can be found in many different places and in different

versions, and although we understand that this could be attributed to the organizational split, it needs to be more carefully addressed for the future than today.

For a PhD student a large part of planning and implementing your individual study plan is tied to having a good work-life balance over time and good and open dialogue around your accomplishments. Today, stress and pressure is often inferred by supervisors and students may lack clear feedback on their positive achievement where appropriate. We therefore suggest further promotion of the use of a process for following up on goals and setting the expectations in a way that reduces stress. We would also encourage discussions on the expectations among the examiners and supervisors and in the study director group, especially tied to what level of independence the programme expects from their PhD students at different times.

Strong recommendations:

- **A tool for discussing expectations –** Promote the use of the expectation discussion tool

Recommendations:

- **Clear online information for supervisors and PhD students** – Collect all information on PhD studies in one place/platform.
- **On-boarding** – Continue to develop the "on-boarding", and provide opportunities to repeat this after a while, as not all can sink in at once.
- **Exchange of PhD courses** – Increase the exchange of information about current and upcoming PhD courses between, and among, the faculty and the PhD students. Support the opportunity to trade courses between other divisions and possibly also with other universities to make the curriculum more relevant and available.

The study courses and programmes are continuously monitored and developed.

The requirement of the local ASP for the PhD education at CSE is that the PhD student should expect to finish 60 hp of courses within their education. The contents of the courses vary from general courses on scientific methods and philosophy of science to more subject specific courses. Also practical courses on scientific writing, innovation and IP, entrepreneurship or pedagogics may be a part of the curriculum. In some subjects the curriculum is well planned and the access to courses is good, in other subjects the PhD student needs to rely on courses provided by other universities and maybe from other disciplines. The PhD students should benefit by a greater predictability of courses tailored for their needs and the faculty would benefit by a clear system where PhD courses would run on a regular basis and where the staffing of PhD courses was done in a similar manner as for undergraduate education.

The number and variety of courses could be better, something which has been voiced and backed by the PhD students. (However, this is a matter that relates to the financial situation.)

Strong recommendations:

- **PhD curriculum –** Make sure to have a carefully worked out curriculum with courses for all different PhD specializations that are running on a regular basis.
- **Funding and staffing of PhD courses –** Make sure that there is a mechanism of staffing and funding the teaching of PhD courses in order to make sure that the delivery of courses actually happens.

Recommendations:

- **Quality of the courses –** It is important so make sure to have a system for monitoring the courses pedagogically, structurally and contents wise.

- **Breadth courses –** Make sure that the PhD students gets an opportunity to take courses in university pedagogics, in scientific writing, in applying for funding and in entrepreneurship and IP.
- **Engage in national and international collaboration on courses –** Make efficient use of regional and national collaboration on PhD courses, both to increase the efficiency and to give the PhD students access to a network of other PhD students in their field.

Supervision

PhD supervision is one of the most important factors for a PhD student to be able to finish with high quality on time and keep their health and sanity throughout the process. A great supervisor can be the difference between finishing your PhD or not. But to be able to get good quality in the supervision one cannot only rely on talented supervisors. PhD supervisors need to be properly introduced to their supervision task and expectation and they need to be further educated, they need support in their work and to share their experiences between each other.

The individual study plan (ISP) is an important tool to follow up the achievements and goals of the PhD education, both for PhD students and for supervisors. With the development of e-ISP, the electronic support for following up the PhD education, the processes for following up the PhD education has been digitized. However, many times the perception from PhD students and supervisors is that the administration around the PhD education has increased and the bureaucracy has become much more complex. It is important to clarify the role the ISP has and how it can be used as an efficient tool in the PhD education.

Strong recommendations:

- **The role of the ISP –** Reduce the bureaucracy around the ISP updates and make sure that it can be considered to be an efficient and purposeful tool in the PhD education. Make sure that the e-ISP system is considered useful and is designed and introduced to support both PhD students, supervisors and the administration in an effective manner.
- **Supervisor education –** Be clear on the expectations of supervisors and examiners, educate supervisors in supervision at least every three years. Supervisory pedagogical education is very important and should be mandatory for all supervisors and when a long time has passed since the last time the supervisor got education there are needs to refuel supervisory skills. Supervisors should take part in some form of supervisory skills development every three years at the least.
- **Supervision recruitment and commitment –** We saw many cases where the PhD students had to change supervisors several times due to staff leaving, some decided to stick to their supervisors even if they no longer work at GU, some were not aware that they could get new or additional supervisors without the old ones leaving.

Recommendations:

- **Exchanging supervisory experiences –** Plan for events where supervisors can exchange practices on a regular basis, such as having supervisor days, seminars or workshops to discuss and share supervisory experiences.
- **Supervisory teams –** By combining novice supervisors as co-supervisors with more experienced supervisors for each PhD student, the learning process increases.
- **Student expectations** – Be sensitive to the PhD students' needs and expectations. It seemed that there were several cases where the expectations were not properly discussed between supervisor and student.
- **Better online instructions –** Collecting information about the PhD education online as guidelines and advice becomes an important information asset for both supervisors and PhD students.

- **Supporting the PhD student's career after the PhD –** Maintain and further develop your routines on how to help the students beyond their PhD. Introduce the PhD student to new networks, help the PhD student getting a postdoc position, etc.
- **Pay extra attention to the needs due to the pandemic –** The pandemic has had an effect on the contact between PhD students and supervisors.

Achieved study results match intended learning outcomes and the qualitative targets of the Higher Education Ordinance.

The department has a well-established yearly individual study plan (ISP) follow-up meeting, sometimes more frequently, and the ISPs often contain good notes of the progress meetings. It is however, only for the more recent PhDs (1-2 years activity) that the learning outcomes are somewhat addressed in the ISPs, whereas that is not the case for the more experienced PhD students. There are reflections elsewhere in the ISP text of the more experienced PhDs that relate to the goals, but not in a way so that progress in scientific maturity is made clear to the parties involved.

Judging by the ISPs presented, courses and activities tend to lag in comparison with the research project. Whether there is a lag with respect to the goals, cannot be judged. The GU-format of the ISP is at times thought of as a hindrance, but seems to work fine for others.

The insufficiency of addressing goals seems to be connected to not having a mutual understanding and aligned expectations of what a PhD education entails between the PhDs, supervisors and examiners. Following the progress with respect to the goals serves multiple purposes; as a follow-up and planning tool to ensure all goals will be met, and that courses and activities match the need of the PhD student to fulfill the goals; to convey to the PhD student that they mature scientifically over the years in black and white, which can reduce stress; and to ensure that the department provides a high-quality education.

Strong recommendations:

- **Joint expectation baselining for supervisors and examiners –** Arrange activities for the supervisors and examiners to get a common understanding of what PhD education entails, and how they can follow-up on their PhD students, and plan courses, activities and research throughout the education, using the ISP. Set up a routine for alignment of expectations between the parties at the start of a new PhD that can also be used during follow-up of the ISP. Take inspiration from the tools that Chalmers provides, and that might be used for the GU PhDs.

Recommendation:

- **Agree on the scientific basis of the PhD studies –** Arrange recurring workshops/meetings to discuss concepts like scientific independence, depth and breadth knowledge of the field, etc.
- **ISP system support –** Join the ISP reference group at GU to take part in developing the ISP use to better meet the goals and expectations of all parties involved.

Teaching is focused on doctoral-centered learning.

There is no doubt that the department, supervisors and examiners are dedicated to ensure a high-quality education that enables the PhD student to a solid future career, both within academia and the industry. However, the above-mentioned insufficiency of addressing the goals, with respect to what a PhD student is to become at the end, can lead to a less well-designed education for each individual PhD. The risk also gets higher as the PhDs are externally funded and work within projects, where milestones and deliverables can overshadow the education, despite the inherent education that being a part of a project is.

Here the examiners play an important role as guarantors of the education, but at present the examiners are not aligned on how to judge achievements, quality and quantity of output, or on how to credit courses and activities.

A special case is the education of industrial PhDs who often do their PhD on part-time and outside the department. There might be a need to ensure that external employers also understand the nature of PhD education so that demands and expectations become too overwhelming for the PhD student. Care must also be taken to ensure that these PhDs feel included in the PhD collegium.

The supervisor(s) are the most important teachers for PhD students, and yet there are cases where PhDs have their main supervisor outside the department. Here, the role of internal supervisors becomes important for day-to-day supervision, and PhD students should be given the opportunity to change supervisors. PhD students also learn from each other, but at present there seems to be little cross-group interactions, which leaves especially PhD students in smaller groups with less peer-support.

Strong recommendation:

- **A system for transferability of credits –** Set up a framework for awarding credits for courses and activities as a support for examiners and PhDs in planning of the education.
- **Supporting industrial PhD students –** Develop a material to clearly guide the companies funding an industrial PhD what is expected of them, both in providing support and avoiding work overload.

Recommendation:

- **PhD student's mutual experience exchange –** Encourage PhD get-togethers, joint seminars, writing workshops to enable more peer learning and support among PhDs.

Teaching and other departmental duties

It is normal that PhD students engage in departmental activities in up to 20% of their work time, most often this means helping out with the teaching of undergraduate courses, but it may also be other departmental duties of an administrative or research supporting nature. These extracurricular activities are good to build the PhD student's pedagogical, administrative and management skills, but they may often come with greater expectations than are reasonable to manage during the allocated time.

Strong recommendations:

- **Teaching expectation predictability –** make sure that the departmental activities for the PhD students are carefully planned and followed up in order to have a balanced set of activities that benefits the PhD student and avoids exploitation of the PhD students in the education.
- **Pedagogical education and support –** Make sure that the PhD students receive pedagogical training and support as part of their planned PhD courses.

Recommendations:

- **Variation and synergies –** Make use of the staffing to make sure that the work tasks are distributed over time, that they are planned for synergies between the PhD student's topic interest and the departmental duties and that there is sufficient variation in the activities.
- **Avoid exploitation –** It is not uncommon that the departmental duties are used for low level activities that do not give sufficient experiences and stimulation, such as producing deliverables in an externally funded project, website creation, conference

management or only low-level supervision. Bear in mind that the teaching experiences sometimes build the future faculty.

Teachers have up-to-date and adequate competence as regards their subjects and teaching and learning in higher education, and the numbers of teachers are in proportion to the scope and content of study courses and programmes.

The quality of the research groups ensures that the scientific competence of the teachers/supervisors is adequate. The pedagogical quality seems good for a large part of the teachers, including those we were exposed to. Naturally, teaching skills vary between the different researchers as a great researcher need not be a great teacher. GU offers courses on PhD supervision, but those are only taken once.

In addition to the academic staff, the PhD students are active in the teaching of courses. They may in general come with different teaching skills, and would also benefit from pedagogical training and supervision, apart from the obligatory course given by GU (PIL101).

Recommendation:

- **Supervisor exchange of ideas –** Arrange supervisor get-togethers to discuss supervision issues and exchange experiences, could be done at Faculty level.
- **PhD students teaching task –** Introduce PhD students to the department's teaching practice before taking on classes/exercises for undergraduate students. Follow up on their teaching experiences, and encourage auscultation.

Study courses and programmes are relevant to the needs of the students/doctoral students and society.

There is no doubt the Göteborg university's PhD educational programmes at the Department of Computer Science and Engineering have a high relevance for the society. The graduating PhD students are quickly employed by both industry and academia, and the alumni speak highly of their PhD education. The supervisor(s) in particular seem to work continuously with providing networks for the PhD students. As previously pointed out, the supervisor(s) is the most important teacher for the PhD student, and as such often the individual(s) with the most relevant network for the PhD. The department has a multitude of collaborations with companies, which can provide PhD students with an insight to careers outside academia. However, there is little organized career planning, something that the PhDs miss.

For most of the interviewed alumni their education was directly relevant for their current job, but they had never been given the opportunity to provide structured feedback to the university on the quality and student experience of their education. We believe that for example exit interviews would make a good contribution to capture issues and possibilities regarding the relevance for the students and society. The alumni could also be a resource in providing networks for the current PhD students, and in some environments collaborations between current PhD students and alumni is happening today.

PhD students were happy about the practical applicability of their research and the fact that they were given the opportunity to do internships at companies and other organizations were much appreciated. We consider the internship opportunities as a very positive opportunity in their education and it is especially good for getting connections when the PhD students are about to finish. The internships as well as the exchanges between the departments, companies and other universities should therefore continue to be an integral part of the education.

The specific study course curriculum is viewed as relevant by most parties, but a lack of relevant courses for some of the PhD students was brought up by both the supervisors, faculty and students. The level of the courses given at the department was viewed as sufficient by most, but it is important to continue to monitor which relevant PhD courses are provided to the students and exchange knowledge of new courses taking place.

Strong recommendations:

- **Off-boarding –** Conduct systematic exit-interviews.
- **Career coaching –** Arrange biyearly career advice activities, can be done on a department, faculty or study program level.

Recommendations:

- **Support PhD student networks –** Continue the good work with providing networks for the PhDs.
- **Exchange for external collaboration –** Continue to expand the possibilities to perform internships and research exchanges
- **PhD course curriculum –** Monitor the availability of PhD courses, to make sure that there are sufficient courses covering the essential areas within the department.

HR-related matters

Several of the issues we were discussing when going through the material about the PhD education at CSE at Göteborg's university and in the interviews could be summarized under the heading HR-matters, However, we have singled out questions about Gender issues, Issues about health and wellbeing under headings of its own. A crucial point for the quality of the PhD education is how the recruitment is handled, if PhD students are hired based on a competitive process where the positions are internationally advertised and an objective process where the best candidates are singled out takes place, or, if PhD students are more headhunted from the Masters education and encouraged to apply for open positions where they are more or less promised a position. Regardless of which overall method one wants to have there are several recommendations we can make to increase the likelihood of a successful recruitment.

Strong recommendations:

- **Recruitment strategy –** Decide on overall strategic principles for recruitment that matches the overall strategy of the research subject within the faculty, when it comes to international recruitment, competitiveness, etc.

Recommendations:

- **Recruitments –** Consider concentrating recruitments to 4 times per year, to get more of a feeling of "classes" of PhD students. Make use of the fact that you have about 25 PhD students per year in total, meaning that there is a potential to create a class of PhD students that can take courses together and learn from each other.
- **Increasing the number of positions –** In order to keep talented students, one may try to find a solution for additional PhD positions or temporary assistant positions. It is in general difficult to find good candidates when the funding is there. Therefore, some measures to overcome this challenge would be valuable.
- **Improving the administration of the recruitment –** Improve the skills and tools on formulating requirements for positions, advertising and getting the positions known to the right networks, by administering interviews and selection processes, reference taking, etc.
- **Evaluation of candidates –** The instructions on how to recruit are lacking detail on how to evaluate the candidates in a fair way - perhaps because of lack of clarity in the ads on what you expect, or lack of agreement on what it is you actually look for and how that is going to be evaluated.

- **On-boarding –** Make sure that PhD students are introduced to their roles early and continuously (even with private things such as how to pay tax, get a bank account, etc.). Provide additional information about cultural and societal understanding and rules, in particular for those coming from other parts of the world. Consider using a buddy-system to help new PhD students.
- **Off-boarding –** Keep track of where the students go after their PhD, they may provide a valuable resource for networks for future students and staff. Exit interviews may serve as a course evaluation to further develop the PhD education.

Health and wellbeing of the PhD students

Being a PhD student is a stressful work situation requiring a good work environment, good leadership, clear supervision, decent work conditions and the opportunities to create a good work-life balance. Today it is very competitive to become a PhD student and therefore the demand on the PhD student can become overwhelming, to say the least. There is evidence to show that the PhD students' working conditions are stressful, overly competitive, unstructured and unsecure which may cause work environment problems. At the same time PhD students are often younger staff that require the best professional type of leadership and this may not always be available in what the university setting can offer. There are, however, ways to overcome this.

Strong recommendations:

- **Work environment issues –** Work towards a better work-life balance for the PhD students. Management was worried and concerned about the health and well-being of their PhD students, although this was not reflected in the PhD students we met or the alumni (but maybe we met a biased sample?)
- **Organization –** Clarify the difference between line managers, the PIs of the PhD student's projects and the supervisors, especially with respect to development talks beyond the supervisory meetings, make sure to implement routines to follow up the quality of the supervision and identify risks in the PhD student supervisor relation.
- **Expectation management –** Make sure to clarify expectations and develop a clear understanding between the PhD student and the supervisor

Recommendations:

- **Constructive follow up –** The regular follow-up meetings were considered very good by the faculty and should be continued and widened.

Gender equality and diversity

The lacking gender equity among faculty, students and other staff was mentioned by everybody as a problem. This was also something that the organization has been aware of for a long time but without managing to get too much of an effect out of the measures taken. There are so many important qualities that can be met by having a more heterogeneous staff composition so the organization should strongly focus on taking measures that will have an effect on the composition of diversity in the staff. There are several measures to take to directly increase the number of PhD students but to be able to make them stay and successfully complete their work there is a need to focus on the basic values of the organization and to learn how to value and make use of the diversity. One of the best ways of achieving an increased diversity among the PhD students is by having an increased diversity in the composition of staff. Making sure to recruit more female faculty will eventually lead to more female PhDs that will be able to complete their education.
The issues of diversity also need to be taken seriously. The share of students and faculty living with a disability is often much higher than the organization is aware of and therefore active measures to create an inclusive work environment for everybody should receive high

priority. A more inclusive work environment and culture usually have great benefits for everybody.

Strong recommendations:

- **Increased gender equality in the faculty –** Make sure to recruit female role models as faculty that can help changing the culture and to increase the interest in the subject.
- **Creative recruitment –** Be creative in recruiting (both faculty and PhD students) to manage better gender balance, while avoiding recruiting someone simply because they are women. There are several examples from other universities where they have managed to recruit more females with unorthodox recruitment methods.

Recommendations:

- **Active measures to improve gender equality –** Work on changing the existing work environment to be more open to and welcoming for increased diversity. This can be done by gender coaching, leadership activities, education and awareness increasing seminars.
- **Measure and follow up progress –** Setting goals and providing incentives is another good way of improving the situation. By clearly declaring your ambitions and following up the effects of the measures taken you start changing the focus.
- **Mentorship –** provide mentorship for female PhD students to avoid drop-outs.
- **Increased gender equality in the recruitment processes –** By having better ways of writing adverts, conducting interviews, taking references and follow up you will subsequently work to improve your recruitment processes from a gender perspective.
- **A work environment and culture for all –** By taking strategic measures to work for the inclusion of everybody in the work environment and creating an inclusive culture may have large benefits for all staff and students.

The study and learning environment is accessible and purpose-oriented for all students/doctoral students.

The study and learning environment play an enormously important role in providing the necessary support, comfort, inspiration and security for the PhD students. The work environment needs to be rich, creatively inspiring and provide an environment for knowledge exchange, an openness to air different ideas and perspectives and for mutual development as PhD students and individuals. For this to happen the environment needs to be accessible and provide a clear goal-directed support for being able to develop and thrive.

Strong recommendation:

- **The importance of culture –** Be very sensitive to the needs of the staff and the atmosphere in your working groups and support openness, creativity, safety and well-being of all staff
- **Avoiding harassment and toxic relationships –** Make sure to have zero tolerance on harassment and observe and monitor the health and well-being of all staff to foster the creativity and purposefulness for all.
- **Avoid discrimination –** No one should feel excluded because of any of the grounds of discrimination and leadership needs to cater for a good culture in the organization on all levels.

A professional administrative support

The administrative support plays an important role for maintaining the organizational culture, for supporting everything from HR, finances, services and infrastructure. The administration often also is an important sensor for problems or issues that need to be dealt with.

Strong recommendation:

- **Experienced administration –** An efficient, sensitive and professional administration is of utmost importance for a well-functioning PhD education, it can support in most of the bureaucratic tasks and may also provide the services that are needed in the work. It can play an important role for the organizational culture.
- **Avoid leanness –** Make sure not to reduce the administration too much. There are also several requests to make the administration more effective. But too much of a reduction in administration may eventually transfer the administrative processes to the PhD students and their supervisors and risks errors and inefficiency in the organization. This could involve making the eISP update process lean, enhancing the processes for administration around travels and purchases, simplify thesis production and publication and administrative routines around the dissertation. In particular it is recommended to improve the administration of recruitment, on- and off-boarding, and maintenance of easily available on-line information.

In conclusion

Our evaluation is based on the documentation made available to us, the site visit, and on-line meetings. We could only interview a small selection of supervisors, students, and alumni. Therefore, our report may be somewhat biased. Further investigations may reveal other issues. By actively using the PhD students, supervisors and alumni as a source of information, CSE may by self-evaluations find valuable ways to improve the PhD education at CSE. This includes in particular conditions of female PhD students and difficulties in supervisor and PhD student expectations.