External evaluation report

PhD education at the Department of Applied IT (ITIT) 2021

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Acknowledgements and contact information

Peer review is the backbone in academia, and we thank the University of Gothenburg (GU) for the opportunity to contribute to the quality development and quality assurance of the PhD education, and also to learn from the processes, perspectives and governance structures at GU. Thanks also to the faculty, the department management group and the coordinators for providing documents, assisting in arranging the digital meeting and the open discussions at the digital arena. Thanks also for providing additional and clarifying information and feedback.

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1 Introduction

The short introduction covers a background and a brief description of the evaluation object. The process and criteria guiding the evaluation is then described

1.1 Background

The mission for the external evaluation group is to, in a peer-review manner, evaluate the PhD education hosted by the Department of Applied IT (ITIT), University of Gothenburg (GU) focusing its academic and pedagogic quality together with its relevance of the society. A statement should be generated focusing what could be developed by GU in order for the PhD education at ITIT to meet the criteria set. The statement can be provided as recommendations and contribute to both quality development and quality assurance.

The evaluation object is PhD education hosted by ITIT in three different subject areas: information systems, applied information technology (IT) towards educational sciences and cognitive science.

At the end of December 2020, the number of active PhD students in each area are the following:

- Information systems (Informatik): 12
- Applied IT towards educational sciences (Tillämpad IT – utbildningsvetenskap): 12
- Cognitive science (kognitionsvetenskap): 2

In total, 12 internal examiners (associate professors and full professors) are active in the PhD education at ITIT. The examiners are active in their subject areas, proposed by the department, processed by the doctoral education committee, and formally appointed by the dean. For emergent subjects areas (under development, like the second one above) examiners can be recruited also from other subject areas. The number of active main supervisors (mainly employed by GU) are in total 22 (11 in information systems; 9 in applied IT towards educational sciences; 2 in cognitive science). The main supervisors are, to a very large extent, active in their own subject area. There are some examples of supervisors acting as co-supervisors in another subject areas within the department.

The different subject areas are owned by the faculty but hosted by the department. The department is organized in different divisions. The following divisions within the department are mainly related to the different subject areas respectively: the division of Cognition and Communication (cognitive science), the division of Human-Computer Interaction (no specific subject linked to the HCI division), the division of Informatics (information systems), and the division of Learning, Communication and IT (Applied IT towards educational sciences). However, there is not always a one-to-

one relationship between division and subject area. Some supervision (and research in general) is conducted across the departmental divisions.

Many, but not all, PhD students at ITIT are linked to different research schools within or outside GU. Examples are CUL (internal) and MIT (external).

1.2 Evaluation – process and criteria

The evaluation process is described and provided by the university and an important part of the process is to use a pre-defined set of criteria. The criteria are summarized below and, to some extent, adapted to the evaluation of PhD education at GU.
A set of criteria.

1. Achieved study results match intended learning outcomes and the qualitative targets of the Higher Education Ordinance.
2. Teaching is focused on student/doctoral-centred learning.
3. The content and form of teaching rests on scientific and/or artistic bases and proven experience.
4. 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.
5. Study courses and programmes are relevant to the needs of the students/doctoral students and society.
6. Students/doctoral students have influence in planning, implementing and monitoring study courses and programmes.
7. The study and learning environment is accessible and purpose-oriented for all students/doctoral students.
8. The study courses and programmes are continuously monitored and developed.

Additional criteria on PhD education exclusively added in the forthcoming evaluation based on the following statement:

“For doctoral education, it is particularly important that the doctoral students have access to an active research environment with sufficient subject depth, subject width and scope. It is also important to take into account the possibility for doctoral students to collaborate with researchers both nationally and internationally and with the surrounding community”.

Source: “POLICY FOR QUALITY ASSURANCE AND CONTINUOUS QUALITY IMPROVEMENT OF EDUCATION AT THE UNIVERSITY OF GOTHENBURG” (p. 3 f.)

Important keywords guiding our evaluation based on the statement above are added:

9. Research environment – activity, depth, width and scope
10. Research collaboration – internally and externally.

As input and part of the process GU has provided important policy documents governing the PhD education. Besides studies of policy documents, an all-day digital meeting (due to the pandemic) has been arranged. The seminar provided the evaluation with qualitative discussions and a set of perspectives on the education. At the seminar group interviews were done covering management views on PhD education at ITIT (department and division management), administrative and coordination perspectives, PhD students' perspectives from the three different subject areas (also covering the role as being an internal and external PhD student at the department), and supervisors' views (also from the three different subject areas and divisions).

The timeline for this evaluation were stipulated by GU, and after a short introduction to the mission early January 2021, we (in the external evaluation group) have worked with the material from February to April, generating a work in progress evaluation report (late April) as a point of departure for input from GU, and then a final version submitted in late May.

All three external reviewers have been active in the evaluation process and the statements and recommendations in this report are generated in consensus form.

2 Evaluation

The evaluation of ITIT below is structured according to the criteria provided by GU followed by some additional insights.

2.1 Results vs. learning outcomes and overall quality

Guiding criterion: 1. Achieved study results match intended learning outcomes and the qualitative targets of the Higher Education Ordinance.

The number of PhD students who are enrolled in the PhD program on the overall level as well as the publications (doctoral theses and published articles in relevant international journals) produced by the PhD students clearly indicates that the quality of the education at Department of Applied Information Technology is satisfactory. The most important criterion is that the PhD students have earned the necessary skills to complete and successfully defend their thesis. This aspect is also achieved by the PhD program at the department. However, it is important to note that we, as external evaluators, have not been appointed to assess the quality in thesis work as such. The PhD are to a high degree employed either in the academy or within the industry.

Hosting PhD education with only a few PhD students and active supervisors, can be challenging longitudinally, and we note that cognitive science only has two PhD students and two active main supervisors. This does not have to be a problem regarding the quality of a particular PhD thesis or a certain PhD student examined in the subject

area, but the challenge in related to arranging a critical mass of people active in the area, and the creation of a vital PhD student education environment.

2.2 PhD student centred learning

Guiding criterion: 2. Teaching is focused on student/doctoral-centred learning.

The PhD program is characterized by a student-centred learning ambition and all PhD have an individual study plan (ISP), even if the role of the ISP (as an active and dynamic instrument or a must needed [administrative] document) may vary among different constellations of students and supervisors. The courses provided within the PhD program have an aim to fulfil the requirements of the PhD examination (examensmålen) and to provide the PhD students with the necessary knowledge of a certain topic (the thesis) and a specific research subject area.

The department has a systematic routine checking that all PhD meet the required standards via the scheduled midterm seminaries and the yearly conference for PhD students. Systematic routines also cover the handling of ISP for all PhD students and the appointment of examiners.

The apprentice, and learning by doing, model present at the department also empowering the PhD student stepwise seems to be a good way to achieve learning.

The relatively large volume and portion of reading (individual) PhD courses that are regulated by the study plans (allmäna studieplaner [ASP]), can on one hand be seen as an ultimate form of student-centred learning, regarding e.g. framing and links to the ISP. On the other hand, reading courses challenge the building of networks, social links and bonds also important for PhD students' learning processes and future employability. Reading courses are also elaborated on below from a content and organizational point of view.

The PhD students' rights to change supervisor has been considered and also operationalized. Some changes of supervisors have taken place at the department, and according to the management this seldom causes major problems. This is handled at the departmental level, and in some case the faculty level has been involved.

2.3 Content and organization

Guiding criterion: 3. The content and form of teaching rests on scientific and/or artistic bases and proven experience.

A large number of PhD courses are offered at the department. This can be relevant and positive regarding content offered to PhD students. But, as stated above, most courses are so-called individual reading courses. The room for flexibility regarding compulsory courses vs. other courses and regarding the volume of course credits

needed differ within and between the three research areas (i.e. Applied information Technology, and Cognitive Science). While the management and the supervisors seem to be quite content with the present organization of courses, the PhD students ask for more general (joint) and generic courses. Individual reading courses can be good for the PhD students in the short run (i.e. for completing their studies and to learn a specific subject/discipline) as stated above, but in the long run the lack of more generic courses provide a potential problem. The latter not at least when it comes to building a common ground, a collective identity or even fellowship at the department. With a growing demand on more general skills (e.g. research ethics and data protection) the PhD students ventilate a frustration and a fear that they are not prepared for the future job market, either in the academia or outside the university.

The PhD students point out the striking unbalance between information systems and applied IT towards educational sciences on the one hand and cognitive sciences on the other. While the first two subject areas are blooming, the latter subject area seem to struggle for its survival. The number of senior staff members (active researchers and supervisors) as well as PhDs within cognitive science is very low as compared to the others. This imbalance is also mirrored by the PhD students, not only in numbers, but also when it comes to the possibility to make one's voice heard in different arenas.

Another imbalance, from an organizational perspective, is the one between arenas and focus within the department and (external) research schools. Some PhD students (and supervisors) are heavily dependent on research schools regarding resources, arenas and courses in order fulfil their goals. Others are more closely tied to the PhD program within the department. To have access to a larger and expanded network can make the PhD educations stronger and expose the students to a large variety of perspectives and resources, but it can also create a reliance to external parties to succeed. A large external network can also lead to a (too) limited core of research and "drain" the PhD education resources within the department. For instance, how do you create a common identity if the PhD education is too limited and non-coordinated? Taking the opposite model, a more internally focused environment, can also have embedded challenges, with too internal perspectives.

The PhD students also perceive that there is a real challenge with information, communication and transparency between the management level, supervisors and the PhD candidates. Especially if you are an external PhD student, there are gaps in communication and access to shared resources. The department seem to have a clear structure in several processes, but this is somewhat unknown to the PhD students. There is also a large degree of difference in terms of access to resources (e.g. travel support) depending on the concrete situation (internal/external, member of research school/or not). While the difference may continue, we believe some more explicit information sharing and transparency around the various models of resource distribution would be beneficial. There is a risk that that the PhD students will be given different opportunities, depending on the personality (to put it differently if they raise questions and demand information) or become too dependent upon their supervisors (and the activity and centrality of a certain person). If the situation with respect to

communication and transparency is not optimal, it may generate a risk for the whole PhD education environment, regardless of how good the intentions are in terms of offering education with high quality.

During the digital meeting with the evaluation committee, some PhD students compare GU's onboarding (introductory) processes with other universities and consider that other universities have a smoother onboarding. Information is said to be lacking and uncertainty linked to tasks, general processes etc. This may be even more important for international students, since not all documentation is in English. The expansion in the organization may have caused gaps in the onboarding.

2.4 Supervisors'/teachers' competence and activity

Guiding criterion: 4. 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 supervisors are in general well-qualified and the research environment at the department is strong and competitive. Several of the staff members are published and well-cited in renown international scientific journals with a high impact factor and active in conferences. The research environment is also active in interactive research and communicating results to the society. The supervisors also consider that they have enough time to supervise.

As stated above the imbalance between subject areas are also a challenge when it comes to the development of supervisors' competence and peer-to-peer learning. Even if you are active in external networks, interacting with other senior colleagues, it is important to share experiences with colleagues on a daily basis. Beyond small-talk, and ad-hoc meetings, a colloquium for supervisors can be an organized arena sharing experiences within and between supervisors in the same subject areas or different ones. In the evaluation, and during the digital meeting with the committee, different perspectives were presented on, and if, a colloquium for supervisors are in place and active, or not. An active interaction between supervisors, sharing experience, planning joint courses, seminars, projects etc., e.g. in an active colloquium, can have positive effects building a more common research environment and a shared policy for the PhD education across the department.

The collaboration and co-writing process between supervisors and PhD students is e.g. described as a process based on negotiations. It is also mentioned working together in projects can be an arena for conflicts related to publications. This is not considered as a huge problem, but it is mentioned that it may be good to have established mechanisms to handle this when it doesn't work out well. The amount of work provided by supervisors in joint writing processes is also discussed in the context of the pressure (on PhD students) to publish, embedded in the compilation thesis

model. The supervisors shows that they are aware of the risks in these processes and have strategies, at least on an individual basis, to handle them.

In order to be qualified as an associate professor (and to be active as examiner and main supervisor) at the faculty and within ITIT, formal requirements are set for supervisor training. In addition to this, the supervisors' formal competence is documented in the PhD students' individual study plan (ISP), which is followed up annually.

2.5 Relevant courses and PhD programmes

Guiding criterion: 5. Study courses and programmes are relevant to the needs of the students/doctoral students and society.

The management and the supervisors are in general content with the PhD courses offered in the PhD programmes, and offered through the different (external) research schools. As stated earlier, the PhD students are in general content, but they also ask for more general and generic courses. The difference in amount of course work was mentioned, and some students found the requirement of 90 hp too high, arguing that it was difficult to find enough relevant courses to fulfil it.

The supervisors also identify a potential for more cooperation within the department (between the subject areas) as well as with external partners (i.e. other universities or the industry/public sector), but they have not utilized this potential yet. A closer integration between subject areas and divisions can be achieved in order to coordinate joint efforts when interacting with external parties. This is a question that the management of the department should look into, and therefore suggested below.

2.6 PhD students' influence

Guiding criterion: 6. Students/doctoral students have influence in planning, implementing and monitoring study courses and programmes.

There are conflicting views on the PhD students' formal and informal influence (participation and involvement) on their education and the PhD program. The PhD students have the formal right to participate in different decision arenas the department (e.g. the postgraduate education council). But still, several PhD students experience that they have problems with having their voice heard. Examples were provided by the PhD students during the all-day meeting with the evaluation committee. Previously the PhD students had problems manning different positions, and to involve, but now they have become more organized and are able to be more active. This is a window of opportunity for the PhD students and for the department, to strengthen the influence and activity, and quality in the long run.

There is also an open question if the colloquium for supervisors should be consider as an open arena (an a formally established arena where PhD students should be represented) for sharing experiences among supervisors and PhD students, or as a non-decisive arena more dedicated to sharing experiences among supervisors only.

Transparency (especially when it comes to information) and equal treatment of all PhD students is important and can be clarified and improved. The PhD students have quite recently organized themselves more clearly and this will most likely provide a better opportunity for both the PhD students and the department (managers and senior colleagues) to meet some of these demands, for example, when it comes to information and equal treatment of all PhD students. With this said, it is important to stress that the department is not systematically disregarding equal treatment, on the contrary. But the knowledge about the PhD program, and where and how participation and involvement should take place, is interpreted as unclear and there is a risk that some PhD will get better information or better opportunities to participate than others. To remedy this problem the department should work with improving their information in order to become more transparent and inclusive. It is important that so-called silent information is verbalised and available for all PhD students and supervisors. For example, all information is not given in English and this is a problem for international PhD students. While the department indicate that they have a plan for the PhD program, this is not always clear for (and known by) the PhD students.

2.7 Accessible study and learning environment

Guiding criterion: 7. The study and learning environment is accessible and purpose-oriented for all students/doctoral students.

The department provides in general a strong learning environment, but there are some imbalances between the three subject areas (especially when it comes to cognitive science). By some of the participants in the interviews, the department is presented as non-hierarchical ("a flat organization"), but for others much information is informal and "silent", making the study and learning environment less known and accessible. Even though the department clearly provides a satisfactory learning environment, the information within the department can be improved. Some of the PhD students, who are not based in Sweden during the pandemic, might lack some of the possibilities that are provided to those who are based in Gothenburg. This possible problem, temporarily or not due to the pandemic, should be addressed by the department to make sure that all PhD students have equal possibilities. If restrictions are present in accessibility this should be stated and explained. The department has the policy to admit only PhD students that are based in Sweden, and postulate that this should be the case. However, taking into account that international PhD students may, temporarily or not, spend some of their time abroad challenge this situation.

Some of the industrial PhD students also have to consider that while they are PhD students at the University of Gothenburg, their salaried positions are with an external

employer. Sometimes they experience that it is hard to find a good balance between their PhD studies on the one hand and their "ordinary job" on the other; an embedded challenge in these settings with implications for accessibility. Some of these challenges could be more clearly addressed by the department, for instance, when it comes to the logistical matters such as the schedule of PhD seminars, PhD courses and timetables, meetings, etcetera.

2.8 Monitoring and developing quality

Guiding criterion: 8. The study courses and programmes are continuously monitored and developed.

The department has implemented the so-called three processes for assessing quality in the PhD programmes used by the university of Gothenburg. The PhD student education manifest is also promising and creative. These two examples indicates that the department has a sustainable clear strategy for implementing and improving the quality if necessary. However, there is a need for better ways of communication between the management level, the supervisors and the PhD students also in this matter (cf. above). A concrete 'diagnostic' question related to this would be: who were involved in the writing of the "Manifesto for PhD education at ITIT" and its implementation? It is also likely that the lack of information and communication (or at least the experience that there is a lack of information) has been affected by the pandemic. Isolation and a lack of every-day communication (including meetings face-to-face and small-talk) have most likely had a negative effect on communication the PhD students and their supervisors, but this need to be further analysed because it may also be other (or even opposite) experiences present.

The current role and status of the general study plans (ASP) are considered as unclear among the supervisors regarding ongoing revisions and/or expectations from department management (if e.g. ASP:s should be merged into one or not) . Considering the latter aspect, there are different perspectives present on if they should be integrated across the three research areas or not.

2.9 Research environment – activity, depth, width and scope

Guiding criterion: 9. "[…] particularly important that the doctoral students have access to an active re-search environment with sufficient subject depth, subject width and scope.".

The department consist of three active research (subject) areas, but the activity, depth, width and scope are somewhat different between the research areas. This may not be a problem linked to quality in PhD education at a certain time, but is a challenge in the long run. Having two relatively large environments focusing information and learning, and one relatively smaller focusing cognitive science raises several quality related questions linked to the latter environment as such, no matter how engaged

the people working there are, and how the department should manage the areas all together, handling the imbalances described also above. The number of senior staff (including supervisors and course leaders) and PhD students are limited. At the same time, it is also indicated by the supervisors and the management of the department that this imbalance can be handled, or even solved by more cooperation between courses, research and the supervision of PhD students. This may not be a direct problem for the PhD students, but the department needs to develop a strategic initiative for how to initiate a deeper cooperation within and between the different research areas in order to build a joint research environment (with enough activity, depth, width and scope). Otherwise, the alternative may be to re-organize (and integrate with other research areas within the department or outside) the latter subject area or even phase out.

2.10 Research collaborations – internal and external

Guiding criterion: 10. "[…] important to take into account the possibility for doctoral students to collaborate with researchers both nationally and internationally and with the surrounding community".

On an overall level the external research collaboration is good. The internal research collaboration is, again, imbalanced and have a potential to develop more (e.g. collaborations between senior staff in supervision across subject areas). At the all-day seminar the impression is also that the supervisors are not (enough) coordinated among themselves. Again, the researchers, supervisors and PhD students in information systems and applied IT towards educational sciences participate in several internal networks within GU as well as in external networks, those in cognitive science are more tied to, and dependent upon, external networks. However, it is clear that the researchers (including supervisors and PhD students) are active, and the department is a welcomed and active partner in both internal and external research collaborations.

2.11 Other insights

Guiding criterion: no explicit. Insights based on data from documents and interviews.

Several of the participants in the interviews have addressed that the University of Gothenburg could assist the department with practical information regarding data protection, ethics and legal competence for signing contracts with external parties (regarding PhD student cooperation or research collaboration more generally).

The administrative support of the PhD education processes is a valuable support function at the department. Motivation and commitment are clearly shown during the evaluation. The focus on more solid enrolment and onboarding of new PhD students is a good example here.

The RED-19 evaluation results have had good effects on the quality and the strategies at the department. We also interpret a more formalized PhD education today, than before (e.g. linked to the RED-19 evaluation and the general pressure for more formalized processes) at the department. A department management that shows a proactive attitude towards quality development is important. We argue this is the case in the present evaluation.

3 Recommendations

As stated above there are several strong and positive dimensions of the PhD education evaluated. Here we focus on dimensions to developed within a quality assurance and development perspective. Below we summarize the recommendations based on the criteria-based evaluation above and, as asked for, suggest a priority among them providing actions sorted into categories: needs to be developed/implemented, and can be developed/implemented. See Table 1 below.

Table 1. Recommendations and priorities

No.	Recommendation	Priority (Need [N], Can [C])
1.	Establish routines for a better information flow and communication between the management level, supervisors and PhD students to guarantee equal opportunities. For instance, to make sure that all PhD students have the same information on e.g. career advice, publication strategies, routines and handling of expenses covered by the department.	N
2.	(Re-)start an active colloquium for supervisors as an organized arena sharing experiences, achieve collective learning and as a vehicle linking activities and actors more tightly together.	N
3.	Clarify mechanisms and arenas for participation and involvement for the (now more organized) PhD students to have an active influence on the PhD program.	N
4.	Make sure that the industrial PhD students and students (more or less temporarily) based abroad[1] or outside the university are (more) included in the daily routines at the department and that timetables are adjusted to different possibilities to participate on-site vs. other commitments. Linked also to recommendation 1 above.	N
5.	Share visions (e.g. the manifest) earlier and establish more effective routines to share the quality development and assurance process and linked documents among PhD students and supervisors.	N

[1] As noted above (see Section 2.7) a part of this recommendation may be due to (or have accelerated during) the pandemic.

6.	Create more generic and general courses for the PhD students (e.g. ethics, communication skills, methods, etcetera); not only courses in the respective subject areas, in order to strengthen the interaction between actors within the department.	C
7.	Further strategically discuss and evaluate the high proportion of individual reading PhD courses and the dependencies vs. (external)research schools.	C
8.	Develop a more ambitious onboarding and introduction for new PhD students – extend the introduction day/s for new PhD students to one week in or-der to offer more basic and common information to all student regarding HR, data protection, ethics, outreach activities.	C
9.	Create a strategic plan for how to create a better balance between the three research areas (and PhD student education subject areas) – i.e. how to address the fact that cognitive science is significantly smaller, less developed and more fragile subject area[2] (for PhD students and senior staff members) at the department level. Clarify the links to the organizational structure, the study plans and the discuss the number of credits (courses vs. thesis) in this work (ASP).	C
10.	Clarify the role that ISP should have for supervisors and PhD students and to what extent it should be an active (dynamic) instrument in supervision.	C

[2] If PhD students should be enrolled in cognitive science in the future, the subject area (and the division) needs to be expanded, and/or integrated in other subject areas and divisions.