



Healing the Earth. Part of Olle Bonniér's artwork at LTH Campus, E building. Photo: Håkan Kogg Røjder

External Evaluation Report 2019
Assessment of the Centre for Engineering
Education (CEE)
LTH, Lund University

Table of Contents

Executive Summary	3
1 Introduction	5
1.1 <i>The evaluation panel</i>	5
1.2 <i>Areas of evaluation</i>	5
1.3 <i>The evaluation method</i>	6
1.4 <i>Organization of report</i>	6
2 Evaluation of Current Activities	7
2.1 <i>Pre-university course</i>	7
2.2 <i>Supplemental instruction program</i>	8
2.3 <i>Doctoral support and training</i>	9
2.3.1 <i>The generic skills courses</i>	9
2.3.2 <i>Supervisor training</i>	10
2.3.3 <i>Organization and management of doctoral education</i>	12
2.4 <i>Academic development – Genombrottet</i>	13
2.4.1 <i>Pedagogical courses</i>	13
2.4.2 <i>LTH’s Pedagogical Academy</i>	14
2.4.3 <i>Research</i>	16
2.4.4 <i>Consulting and development</i>	19
3 Evaluation of CEE Governance and Organization	22
4 Conclusions and Future Perspectives	25
5 Thank You	26
References	27
Appendix 1 CEE Instructions	28
Appendix 2 Genombrottet Framework	30
Appendix 3 Site Visit Schedule	31
Appendix 4 LTH Organization	33

Executive Summary

Do the current activities at the CEE meet its mission? How could the CEE be strengthened to play an even bigger role to support LTH to reach the ambitious goals of the LTH strategy, to further increase quality of work and impact of activities, and increase long-term sustainability?

The Dean of the Faculty assigned the evaluation to a panel made up of four external, partly international experts. As input to the evaluation, the CEE had prepared an ambitious self-assessment report. For two days, the panel visited LTH to discuss and interview a broad representation of stakeholders at LTH. This report is the synthesis of the panel's interpretation of the findings.

The answer to the first question above is YES: the CEE fulfills its current mission very well. The evaluation panel is impressed by the quality and reach of the activities carried out in the scope of the CEE. We have got the impression that the CEE achieves a lot with very limited resources. We found the CEE staff to be highly dedicated and engaged.

We have also been critical and have identified aspects at various levels in the organization that could be enhanced or should be improved to ensure long-term sustainability. We hope our outside perspective together with our recommendations will make this report a valuable input for the CEE and LTH management in further development.

1. The current CEE is a composition of detached activities, bits and pieces, partly service-oriented, partly innovation- and research-driven. A strong profile of the CEE requires a coherent set of activities that match the mission. A long-term vision for the CEE is missing and we highly recommend to establish one for the next 5-10 years that is well-aligned with the LTH Strategy 2026.
2. The departments and faculty expect a proactive attitude of the CEE. The center is expected to give solicited and unsolicited research-based educational advice that is tailored to the needs and contexts of the departments and the faculty as a whole. Leadership is expected, and is also necessary to profile the CEE as a center of excellence in engineering education. We acknowledge that the CEE has managed to implement a strong cultural approach to change, but we doubt if this could be sustainable without adding a political dimension (power, influence, taking part in decision making processes).
3. In many aspects the position and role of the CEE in the LTH organization should be transparent and formalized:
 - a) The center has to be formalized in the organizational structure of LTH.
 - b) The expected contribution of the CEE to the mission and vision of LTH has to be explicitly formulated to give direction to the CEE management.
 - c) The manpower resources and personnel policy, staff continuity and professionalization of the CEE leaders and experts have to be explicitly included in LTH faculty plans.
 - d) Communication and reporting between the Faculty board and the CEE Board have to be formalized, for transparency, and to restore mutual trust.
4. The CEE should improve its visibility in the Faculty of Engineering, the departments, and the outer world to make activities impactful.

- a) Genombrottet has achieved a massive and far-reaching impact on engineering education in the international community of academic developers. Genombrottet has put LTH and LU on the global map. The choice shall be made to brand either the CEE or Genombrottet as *the* LTH center of expertise in engineering education.
 - b) Courses, research and innovation areas at the CEE should be tailored more to the specific needs of the departments and divisions. The research and innovation strategy should give a clear direction of themes for the next five to ten years. These needs may be related to educating the engineers of the future, with emphasis on different knowledge and skills such as cross-disciplinary activities between the departments, engineering ethics, the digital transformation in engineering, but also new didactic methods such as innovative digital questioning in online exams.
5. The Excellent Teaching Practitioners (ETPs) are a highly valuable, but to some extent under-exploited, source for educational research and innovation, at course, program and department level. The expertise of the ETPs could and ought to be adopted to set up a cross-disciplinary platform for transformative learning and research at the faculty.

1 Introduction

In this section we describe the starting point for the evaluation, the methods used and how the report is organized.

1.1 The evaluation panel

The evaluation panel is composed of academics with special interest in developing teaching and learning in higher education, representing expertise in all major aspects of the CEE activities. The four panel members are:

- Cecilia Christersson, Pro-Vice-Chancellor of Global Engagement and Challenge Based Learning, Malmö University, Sweden
- Lena Peterson, Senior lecturer at the department of Computer science and engineering, Chalmers University of Technology, Sweden
- Aldert Kamp, Director of Education, TU Delft Faculty of Aerospace Engineering & Leader of 4TU.Centre for Engineering Education, the Netherlands
- Gitte Wichmann-Hansen, Associate Professor and Research Director, Centre for Teaching and Learning, Aarhus BSS, Aarhus University, Denmark

1.2 Areas of evaluation

The purpose of this assessment assignment given by the Dean of the Faculty to the evaluation panel, is to assure that the activities at the CEE meet the Mission of the Centre for Engineering Education (see Appendix 1 for the entire CEE instructions). To understand how CEE effectively can capture and meet the needs of the faculty, it is also important to evaluate the role of the CEE in the governance of LTH and how the CEE is embedded in the organization of LTH. In the *Instructions*, the mission for the CEE is stated as;

“The Centre for Engineering Education should:

- Perform academic development work within the framework of Genombrottet, as described by the faculty board (2005-05-26).
- For all doctoral education disciplines at LTH, conduct training with special emphasis on the degree objectives not included in the dissertation work, as well as education and training for doctoral candidates, and assessments in support of doctoral education.
- Conduct competence development activities with focus on education and research, especially regarding the qualifications of university staff.
- Run the Supplemental Instruction program at LTH.
- Deliver foundational programs for recruitment to LTH’s education program.
- Develop and perform other activities that are consistent with the purpose of the Center for Engineering Education.”

For completeness, the description of the framework of Genombrottet, referred to in the CEE Instructions, is included in Appendix 2.

In this report we have addressed the activities stated in the mission for the CEE in the following order:

- Pre-university course
- Supplemental Instruction program
- Doctoral support and training
- Academic development – Genombrottet

For each activity we identify strengths and possible improvement areas; for most activities we also suggest some specific improvements that may serve either to enhance the quality and/or the impact, or to increase long-term sustainability. We also included in our evaluation the role of the CEE related to the governance of the LTH and how the CEE is embedded in the organization to ensure accountability.

1.3 The evaluation method

The CEE's extensive self-assessment report from 2018 constituted the basis for our focus and data collection prior to our two-day site visit to LTH, Lund, on February 26-27, 2019. The visit included meetings set up between the evaluation panel and representatives for the LTH management, the CEE staff and management, and persons who directly or indirectly benefit from the CEE activities. The detailed schedule is found in Appendix 3. Based on the self-assessment report and the site visit, this evaluation report has been produced, which was sent to LTH in June 2019. In the period from February to June, the panel held several online meetings to discuss core findings and conclusions to finalize the evaluation report.

1.4 Organization of report

In the following section 2 we focus on the six-bullet activity list covering the Mission Statement. However, we have chosen to consolidate the activities into four sections that encompass the core activities of the CEE: the pre-university course, the Supplemental Instruction (SI) program, the doctoral support and training, and finally, the academic development – Genombrottet. In section 3 we take a broader view of the CEE and discuss the organization and governance of the CEE within LTH and LU, the CEE's role within LTH and the CEE's future mission. Included in the sections, we identify areas for improvement and suggest related changes we believe would increase the future impact of the CEE. In section 4 we summarize our findings and draw major conclusions.

2 Evaluation of Current Activities

In this main section of our report, we evaluate the activities listed in the CEE Mission Statement. First we consider the pre-university course and the SI program each in its own subsection. Thereafter, we group all main activities having to do with supporting doctoral students and doctoral supervisors in the third subsection. In the fourth subsection we merge relevant activities of academic development within the context of Genombrottet.

2.1 Pre-university course

The purpose of the pre-university courses in Sweden is to increase the number of eligible students for programs with too few applicants. In this particular case students who do fulfill the general prerequisites for university studies, but do not fulfill the special prerequisites for LTH's engineering programs, can take these required high-school courses during one academic year. The subjects offered are mathematics, physics and chemistry.

The pre-university course is highly appreciated by the students enrolled at LTH. They believe, that the pre-university course gives a great advantage in becoming familiar with the university way of studying. Our interviewees expressed that the student group being small (around 30 students) made it easy for on one hand the teacher to adapt the teaching individually, and on the other hand for the students to feel comfortable in asking questions. They highlighted that the learning conditions are quite different for the math courses in the 5-year engineering programs, where there is a lot of content to cover and large student groups. The students commented that one thing the mathematics studies in the pre-university year and in their current studies do have in common is that mathematics is taught, and is perceived by the students, as a stand-alone subject. For the pre-university course, the evaluation panel feels that the missing connection between mathematics and engineering is a wasted opportunity for making the case for engineering studies within the pre-university course. The students we met, had however, already, before starting the pre-university course, decided to continue their studies in engineering, so needed no extra encouragement about that, so this lack of connection to engineering during the pre-university course did not bother them.

There is a risk that the pre-university course becomes too isolated and vulnerable because only a few teachers teach the course, which is the case today in mathematics and chemistry. The upside is that one teacher covers everything within the subject. In physics on the other hand several teachers teach, but the students pointed out that not all of them are well-informed about the pre-university course context. The students perceived a lack of connection between the lectures in the physics part, which they attributed to a lack of communication among the teachers.

Suggestions for Improvement of pre-university course

Currently the pre-university course is neither managed nor evaluated the same way as other programs within LTH. As mentioned in the self-assessment report there is a new ordinance for courses such as this one¹ from January 2019, which will require many things to be handled the same way for the pre-university course as for regular university studies.

- We support the notion that the pre-university course should get the same attention and follow the same procedures as the engineering programs.

¹ Förordning (2018:1519) om behörighetsgivande och högskoleintroducerande utbildning

- We also believe the pre-university course ought to be clearly connected to the math department, which is not the case currently. It would be beneficial for the sustainability of the program to have additional teachers involved in mathematics and chemistry. However, when there are several teachers involved, it is vital that there is one main teacher who ensures continuity within the teaching from the student perspective and that all teachers are well-informed about the pre-university course context.
- LTH could use the pre-university course more actively to increase the diversity among its engineering students, and the new ordinance supports such an approach. Also, the fact that LTH now has room to increase its number of students after many years of overproduction, makes this feasible.
- From the site visit we understand that the limiting factor to increase the number of students is the lack of lecture halls at Campus Helsingborg. It may well be worth investigating this issue further.
- Furthermore, if the number of students in the pre-university course increases, it may be possible to introduce some elective parts in the course, at least for those students who do not need to take all parts of the year to be eligible to apply to the engineering programs. The pre-university course at LTH is carried out as one full-year course. We believe that a division into clearly designated sub-courses would be beneficial to make each department involved in the course clearly responsible for its parts of the course. Such a division of the course would also permit elective parts within the course.
- To stimulate even more students to enroll in an engineering study after the pre-university course, it might be valuable to enrich the course with engineering context connected to the pure mathematics and physics courses, in addition to more strategic measures mentioned in the reflection of the CEE self-assessment report.

2.2 Supplemental instruction program

Supplemental instruction (SI) is a support activity that focuses on accommodating difficult courses rather than on weak students. SI sessions are group activities, available to all students in a course, led by more senior students, SI leaders, who support the groups in exploring the course contents independently from the regular teaching in the course. SI was invented at the University of Missouri-Kansas City in 1973 to improve student retention and completion rate of the more challenging courses. LTH has pioneered the use of SI in Sweden and LU hosts the European Centre for SI-PASS, one of five such regional centers across the globe.

Our impression is that SI sessions are highly appreciated by the students who participate, which is around 90 % of all student. The SI program is well managed and the SI leaders feel very well supported by the SI management; in some cases almost over-supported. Also, the SI leaders pointed out that the two-day course they had to take before becoming SI leaders was highly useful and relevant for them to feel confident in their role. They especially mentioned the role-play module as useful, in which they practiced how to promote discussions in diverse groups and how to discuss the topic without giving the participants the answers.

The students wanted to become SI leaders to enrich their own experience in obtaining leadership and group management skills, not mainly for the pay. They pointed out that they learnt a lot by being SI leaders and that it is a good thing to have on the CV, or even on the diploma supplement. A

suggestion brought up was that the SI leader commitment could count as “an extra point” when applying for international exchange studies.

Suggestions for Improvement of SI

The SI program is very well run as it is. What is somewhat worrying is that only two persons within the CEE run the entire SI program. Therefore we suggest that the CEE engages additional teachers (maybe ETPs?) to support the SI program.

The SI management at the CEE pointed out that the enrolment in SI has decreased somewhat in the last few years. In the self-assessment report it was suggested to “do research on the reasons why students do not attend SI and create an action plan to address these reasons”. During the interviews, however, we identified that the participation in the *regular* math exercise sessions has decreased even more. Therefore,

- we propose an investigation of the SI program combined with an investigation about participation in regular math exercises. Such an investigation should preferably be performed by the SI management and the mathematics department in conjunction.
- We also propose to define one or two key performance indicators (KPIs) for the SI program defining the desired quality and impact levels. They could, for example, justify the needs to do research about why students do not attend SI, or to draft a plan to mitigate a decrease in participation below the desired level.

2.3 Doctoral support and training

In the following section, we evaluate the doctoral-related activities at the CEE. We report on three main activities: 1) Generic skills courses aimed at doctoral students, 2) Pedagogical courses aimed at doctoral supervisors, and 3) Organization and management of doctoral education.

2.3.1 The generic skills courses

The generic skills courses in the LTH joint doctoral course program are generally well attended, cost-effective, and positively evaluated. The course evaluation summaries in the CEE’s self-assessment report were confirmed by the interviews made during the site visit. The courses are generally perceived relevant by doctoral students.

In particular, students praise the course on “Academic Writing for Publication”. It is perceived highly relevant since many engineering students are not comfortable with writing and since publication is a core output, upon which they are being assessed at the end of the day. A clear pay-off is also that students get a good sense of the CEE’s work through this course. However, the timing of the course is a challenge. Partly, because it is a very popular course and as a result, students are queuing up. Partly, because students benefit most from the course when they are actually working on a concrete paper.

Our interviews during the site visit revealed that students perceive ‘The Introduction to Teaching and Learning in HE’ an important course, though students have varying experiences with the group project as part of the course. Particularly, the interviews revealed a call from students for more continuous training of teaching competences, e.g. by means of a mentoring program based on observations and feedback, which could supplement the one-off Introduction course. Interviews also revealed that doctoral students appreciate the biannual campus conference on teaching and learning at LTH

(Inspirationskonferensen), which indicates that the CEE could focus more on doctoral students as a likely target group for additional ongoing pedagogical initiatives.

Overall, students report satisfaction with the reduced course demand within recent years (from 90 to 75 ECTS, on average). The evaluation panel appreciates this development. We also support the CEE if they will argue in favour of less ECTS because the current ECTS level is still on the high side and because [recent surveys](#) among doctoral students back up a cut down on course demand.

Finally, we strongly support the idea put forward by the CEE about making the course “Introduction to new Doctoral Students” mandatory. Firstly, because it will resemble the course practice at most other doctoral educations in Scandinavia. Secondly, because it is an obvious way of addressing core themes that could potentially prevent problems later in the study process.

Suggestions for improvement of generic skills courses

Regarding the generic skills courses, we suggest that the CEE:

- Offers the course on “Academic Writing for Publication” on a more frequent basis, being aware that this requires additional staff resources. Alternatively, the current staff resources could be used to support students’ writing by means of other formats than traditional courses, e.g. by referring students to writing groups arranged by [The Academic Support Centre](#) at LU or by establishing a similar concept at LTH, or by facilitated writing-retreats on campus (see for instance the [writeconcept](#)).
- Supplements the one-off introduction course on teaching and learning with continuous training, e.g. by means of a mentoring program based on observations and feedback by senior academic teachers.
- Makes the course “Introduction to new Doctoral Students” mandatory. We also suggest that the workshop includes a session about “how to manage your supervisor”, including strategies on how to be proactive during supervision meetings, how to take ownership of the project, how to match expectations, etc.
- Maintains or decreases the current ECTS requirements, since it is still on the high side.

2.3.2 Supervisor training

The main development activity aimed at doctoral supervisors is the LTH Docent course. The evaluation panel acknowledges that the course is comprehensive, long-term, and that Heads of Departments (HoDs) endorse supervisors’ participation, because all three characteristics are part of successful doctoral supervisor development programs (Wichmann-Hansen et al., in print). In addition, participants evaluate the course positively; it runs regularly and it has already reached more than 60 % of the potential group of main supervisors at LTH. In particular, supervisors appreciate that - over time - the focus of the course has shifted from regulations and rules towards pedagogical strategies. The interviews showed that the supervisors easily found their way to the CEE for more advanced advice and consultation. They expressed their wishes for dedicated advanced workshops for supervisors, to share experiences about specific themes or subjects. We also heard a call for workshops with a mix of supervisors and PhD students to better appreciate each other’s perspectives and to increase empathy on both sides.

It is mainly junior supervisors who attend the Docent course and thus, there is a need for initiatives aimed at more experienced supervisors. The need for additional supervisor development initiatives is recognized by the CEE in their self-assessment report (2018) as well as by the interviews with doctoral supervisors, students, study directors and HoDs during the site visit. Overall, supervision was perceived as well-functioning at LTH, however the interviews revealed some variation in supervision practice that calls for action:

1. Students spoke about good supervision as a matter of ‘luck’ (“*I have been lucky, but I hear of students that experience problems with their supervisors. I have been luckier than most others have*”). The term ‘luck’ indicates that the quality of supervision is to some extent a question of chance related to personal attributes rather than professional and systematized practice by the supervisor.
2. The student union (The PhD Student Section at LTH) reports of instances of conflictual supervision relationships that are difficult for students to manage due to the asymmetrical power relationship in supervision. A “Doktorombudsman” position has been tried out, but abandoned, because the person holding the position was stressed out. Thus, the student union is unsure about how to support doctoral students who experience conflicts with their supervisors.
3. Whilst the dominating hands-on supervision practice at LTH is very efficient in terms of high completion rates and high quality products (parallel to most other science faculties worldwide), the downside is a feeling of reduced student ownership and independence.
4. The quality of research environments is varying to a high degree across departments at LTH. Some departments are good at welcoming doctoral students to the professional and social community, whereas others could benefit from an increased awareness of how to integrate students. Consequently, loneliness and burnout among doctoral students are issues that need attention.

It is not possible for the evaluation panel to estimate the scale and severity of the problems addressed above. Therefore, we are very content with the fact that a survey is conducted among doctoral students at LTH, during spring 2019. It will be most interesting to learn about the results and the subsequent actions, including the role of the CEE.

The core remaining question is if and how the CEE should address *senior supervisors* at LTH. We have concrete ideas for this, please see the section below.

Suggestions for improvement of support for doctoral supervision

Regarding doctoral supervisor training, we find it to be a core focus for the CEE to get the senior supervisors “on board” and thus to implement ongoing competence development as a supplement to the one-off Docent course. According to the CEE’s self-assessment report (2018), voluntary support programs for *experienced* supervisors are under way. The programs are organized around pedagogical themes (e.g. communication skills or feedback) and they are announced broadly across departments at LTH. However, interviews with supervisors and department managers during the site visit suggest that the CEE considers additional or alternative approaches to these programs.

Suggestions related to the *format* and the *content*:

- As regards *format*, supervisors said that they prefer workshops tailored to departments or even to subject-specific research groups within departments. The CEE might consider this idea in the sense that supervision is a teaching form that to a high extent mirrors disciplinary features, e.g. discipline-specific writing norms and conventions. Supervisors also suggested that the CEE offers group or individual sparring instead of formal programs. Sparring and similar individualized help would be in line with the general requests expressed by the interviewed teachers and department managers regarding competence development. As senior professionals, they prefer practice-related, informal, and customized discussions with peers and the CEE staff members rather than formal courses.
- As regards *content*, the department managers discussed issues that did not translate easily into classical pedagogical themes. For instance, the Directors of PhD studies reported on an increased bureaucratic burden due to the new quality system for PhD education. The ISP (Individual Study Plan) process focuses on formalism rather than on actual pedagogical issues. Consequently, the idea of controlling instead of supporting, negatively affects supervisors' engagement and enthusiasm. A future theme for programs aimed at senior supervisors could therefore be '*how to invert from control to support*', including how to apply the outcomes in the Qualifications Ordinance rather than slavishly checking all individual goals. Other themes of specific interest mentioned in the interviews were:
 - "Ethics in research and supervision"
 - "How to recruit more female doctoral students"
 - "How to balance hands-on supervision with students' independence"
 - "How to integrate students in the daily research environment and thus, try to diminish loneliness"

Furthermore, we suggest that the CEE is closely involved in the coming process of advising the LTH Doctoral Education Board (FUN) on how to interpret and act upon the results of the current survey among doctoral students. Surveys tend to be shelved, especially if they reveal unpopular results.

Finally, we recommend the CEE to support the student union in re-introducing an "ombudsman" function. The idea is to offer students a 'safe' space for sharing problems and receiving help on how to manage conflictual supervision relationships. The profile of such a person should not be a student, though (as it formerly was at LTH). It could be an academic staff member from the Department of Psychology at LU who holds coaching competencies, or an educational developer from the Division for Higher Education Development at LU, or an administrative staff member from The Academic Support Centre, LU. It could, thereby, be offered as a joint initiative for doctoral students across faculties at LU.

2.3.3 Organization and management of doctoral education

The doctoral-related activities at the CEE are multi-faceted and thus seem to have a significant impact in the LTH organization. Activities include various formats such as regular supervisor development programs, on-demand workshops, and local research. They address different subjects such as examination processes and academic conduct. Both students and supervisors are target groups, and the collaboration involves external partners, stakeholders, and peer educational developers. Moreover, the activities produce a large number of artefacts that are relevant for the LTH organization.

Furthermore, the CEE faculty study director has a seat in FUN, which enables direct involvement in faculty policies for doctoral education. Based on data collected during our site visit, we find a positive

synergy between the multifaceted portfolio of activities that support doctoral education and the presence of the faculty study director. Whilst this is very impressive, it raises two main questions:

- 1) Since it is perceived valuable that the faculty study director (who is an educational developer) is in the line management, why is this not considered applicable for other educational developers in Genombrottet, e.g. to have a seat in the Education Board (LG GU)?,
- 2) How will the CEE go about the imminent problem of the increasing demand for doctoral-related activities combined with limited personnel?

Suggestions for improvement of the organization of doctoral education

We suggest that the CEE soon finds a sustainable solution to the problem of limited personnel dedicated to doctoral-related activities. We believe that the CEE would either have to lower the overarching ambition of being “relevant and available to all involved stakeholders” (as they phrase it in their self-assessment report (2018, p. 52) or to insist on resource supply to double the number of staff dedicated to doctoral-related activities.

2.4 Academic development – Genombrottet

Genombrottet’s intention of *supporting an emerging culture of SoTL at LTH* is in focus in this section. We address four main practices at the CEE: 1) Pedagogical courses, 2) LTH’s Pedagogical Academy, 3) Research, and 4) Consulting and development.

2.4.1 Pedagogical courses

The CEE offers a number of courses to the faculty members at LTH that serve to fulfill the requirements according to the Program Syllabus for the Qualifying Program in Teaching and Learning in Higher Education (BHU) at the Faculty of Engineering, LTH (LTH, 2012). According to the BHU syllabus the courses:

- should adhere to recommendations of The Association of Swedish Higher Education Institutions (SUHF).
- are organised into:
 - a) *general courses* in teaching and learning in higher education
 - b) *subject-specific courses* in teaching and learning in higher education
 - c) *specialisation courses* in teaching and learning in higher education.

The CEE offers 14 courses: three in category a), eight in category b), and three in category c). All in all, around 18 course installments are taught annually.

To fulfill the ten-week BHU requirement two weeks each from categories a) and c) are required. With this requirement of at least two weeks in category a), the three-week course *Introduction to Teaching and Learning in Higher Education*, which is also offered to PhD students, is in practice, although not formally, compulsory to fulfill the ten-week BHU requirement.

The evaluation panel met PhD supervisors and department representatives (two groups) where we among many other issues discussed the courses offered by the CEE to the faculty. The department representatives felt that the CEE’s courses offer a common language for pedagogy, especially now when PhD students who teach also take the pedagogical introduction courses so that faculty and doctoral students share this language. The representatives wished for initiatives within ethics, digitalization, which could be in the form of courses. But the representatives expressed an

understanding that offering courses will not help in itself, since teachers are quite busy and often do not have time to participate in a course. For issues related to PhD supervisor training see section 2.3.2.

Our impression is that the existing courses are well-designed and highly appreciated by the participants. There is a reasonably broad set of courses for various interests of teachers, although, as mentioned, there are some wishes from the department for other topics.

At our site visit, the courses were not discussed in terms of the ten-week BHU requirement, but we know that it is very important for teachers to fulfill this requirement. It is also the one point where all teachers have to interact with the CEE. Therefore, it is relevant to address the course offer in relation to the requirements for the BHU. Possibly the requirements could be simplified? We also noted that the current syllabus “Utbildningsplan BHU” is from 2012 and thus does not refer to the current version of SUHF’s recommendations: “Rekommendationer om mål för behörighetsgivande högskolepedagogisk utbildning samt ömsesidigt erkännande (Rek 2016:1)”, but to the earlier version from 2005.

Suggestions for improvement of pedagogical courses

The evaluation panel received many suggestions for new courses, especially in hot-topic areas; but there is also an understanding among HoDs that new courses do not solve the problem of attaining new knowledge and new skills, if faculty members do not make time to attend them. So we do not suggest any particular new courses. However, we suggest that a “user-oriented” approach may be one way to make sure departments and divisions acquire the new knowledge and skills they express they need and to get teachers to participate, even those “who does not have time” Such an approach would involve researching the high-priority needs at departments and divisions, designing modules on these topics and actively approaching those who previously expressed that they need this particular knowledge or skill. This approach was used in the business development project “Affärskompetens nu” in northern Uppland recently, to reach overworked owners of small businesses². We further suggest that some of the modules in category b) could be even shorter and be updated regularly (maybe every three years) to reflect the current needs expressed by the departments. A clear process for this capturing of needs would be valuable so that all HoDs know how they can contribute.

In line with our comments above, we suggest that the BHU syllabus should be revised to reflect the current version of the SUHF goals. Probably no, or only minor, changes are needed to the courses to fulfil the current goals; the self-assessment report indicates that this is most likely the case. But we still think this fulfilment of the goals should be formally stated. Furthermore, we question the decision to let the entire Reader course (docentkursen) count within BHU, (in total three weeks) when a substantial portion of that course is not clearly connected to the current version the SUHF goals; this is especially glaring when several other courses only count in part.

2.4.2 LTH’s Pedagogical Academy

The Pedagogical Academy of LTH is a nationally well-known academic reward system pioneered already in 2000-2001 with the purpose to bring academic recognition and increased status to teaching and learning, and to improve the pedagogical competence at LTH. The scholarly recognition is focused on the applicant’s commitment over time to critically reflect on their own structurally

² See <http://www.affarskompetens.nu>

development of research-based teaching methodology applied to enhance their students' learning within the discipline, and how to disseminate their analyzed experience to the academic community.

Excellent Teaching Practitioner (ETP)

The admission and assessment process to the Pedagogical Academy, is to obtain the distinguished recognition of Excellent Teaching Practitioner (ETP), which has been evaluated and improved throughout the years. As late as in 2018, new criteria were accepted along with introducing an external assessor in the collegial assessment group, indicating a dynamic and adaptable system. In addition to the ETP scholarly recognition, monetary incentives are rewarded both to the individuals and to their departments. So far, a total of 186 applications have been submitted between 2002 and 2018, and of these 128 have been accepted. In the self-assessment report, it is stated that 18-20 % of all academic teachers at LTH are recognized as ETP teachers and many of them are actively involved in institutional development of teaching and learning by serving on boards and committees. Forty percent of the HoDs, vice Deans, deputy Dean and the Dean are ETP recognized teachers. The fact that teachers appointed to the Pedagogical Academy are represented in policy- and decision-making bodies of the faculty, is used as a key indicator of institutional development in relation to excellence in teaching.

In many discussions during our site visit, the role of the Excellent Teaching Practitioners (ETP) was addressed. The highly qualified and senior experienced teachers and educational innovators mainly seem to be “star performers”, but are only to a lesser extent utilized as such by the faculty and departments. The ETPs have limited possibilities for further personal growth, whilst “an ETP distinction should be considered as a driver’s license”. The members in the department management sessions suggested that ETPs could be used to develop a wish list of educational innovations in the departments or define and implement educational vision and strategies for the department in close collaboration with management.

Suggestions for Improvement

From the discussions at the site visit, we clearly could interpret a strong will of the ETPs to be seen as an agency for further development or change of the teaching and learning at the whole faculty. In one way, the ETPs' engagement and will to drive change, support the theory of change on a culture driven level. Additionally, it was expressed that ETP should not only be for an elite and ending in a “star” recognition, but be accessible and possible for many teachers, and rather be applied as a “driver’s license” for continuous career development – a form of an inclusive career track. We assess that the ETPs' potential as powerful professionals in the organization is not fully used. Currently, the ETPs serve as peer reviewers for ETP applicants, and their existence bear witness of the fact that teaching is prioritized and recognized at the Faculty. However, we advise LTH to consider a more strategic role for the ETPs, which we suggest can be facilitated through for example:

- ETPs could be involved together with the CEE to conduct practise-based research with focus on the specific discipline and learning, and as promoters of the translation of research results into improved teaching practice.
- ETPs could be good change agents for the CEE, working in cross-disciplinary teams in relation to integrating for example digitalization in teacher practise. Change in that area, was clearly voiced as having to go through students that preferably should be a part of these teams for transformative change (students as partners).

- There was a clear address to the department heads to take the role of ETPs further by assigning teams of teachers to be critical friends to colleagues both in the teaching and learning environment and in the preparation of applications (eg both for research project in higher education as in the process of preparing for ETP applications).
- ETPs could contribute to the CEE integrating a cross-disciplinary platform for transformative learning and research at the faculty. A long-term strategy could collaboratively be set to address how to involve and reach out specifically to departments and teachers that hesitate or express some resistance to the process of transformation. (Leaving no one behind is a great motto which supports the culture change theory of the CEE.)

The CEE could facilitate and support such process and host a pool of expertise. Obviously this requires transparent agreements between the CEE Board, department management and staff member to control the tension between the disciplinary research by an academic staff member, and his or her tasks in educational development and research.

On a more practical, and probably less demanding, scale there are also small, but concrete, ways in which the CEE could involve ETPs for example by:

- inviting ETPs often and regularly as contributors at the pedagogical courses for teachers, e.g. by asking ETPs to present their teaching experiences and to provide feedback to participants.
- listing ETPs as resource persons with specific expertise labels, e.g. “expert on technology mediated lectures” or “expert on doctoral supervision”. This will give directions to teachers what experts they can approach on par with Genombrottet’s staff members as sparring partners on specific teaching issues.
- inviting ETPs to hold informal one-hour “brown bag lunch meeting” once a month, where teachers can share pressing/burning challenges and get advice.

Such minor tasks may not require formal agreements but should be communicated to the departments.

2.4.3 Research

The research subjects represent a wide impressive spectrum. At one end of the spectrum, we find practice- and design-based research conducted by regular academic teachers about their own courses. At the other end of the spectrum, we find research on organisational and academic development conducted by Genombrottet staff members. In between, we find projects conducted by doctoral students whose outcomes do not directly impact the departments.

In particular, the evaluation panel would like to stress the achievements Genombrottet has accomplished regarding research on educational development. The academic staff have produced very solid and relevant knowledge about the role of academic developers, institutional and cultural change processes, and teaching reward systems. The large number of international presentations and invitations are in themselves a valid indicator of Genombrottet’s massive and far-reaching impact on how the international community of academic developers think and talk about development in Higher Education today. There is no doubt that Genombrottet has put LTH and LU on the global map as an example for cloning in terms of theory-driven, aligned change agency, not least because they have made a serious effort to disseminate research about their own practice as developers. The publications also indicate that the staff at Genombrottet comply with the standards they require of academic development research in general, e.g. to be grounded in theory and to focus on the wider implications of findings (Roxå & Mårtensson, 2017).

In general, the evaluation panel would like to acknowledge that Genombrottet has managed to prioritize, conduct, and promote research at a very impressive level with regard to quantity and quality. It is especially impressive in light of the somewhat unclear research direction of the CEE, which resembles the conditions at most academic development centers in Sweden and internationally (Stigmar & Edgren, 2017). Like many other centers, the *raison d'être* for the CEE is to support the development of teaching and learning at the institution (in this case LTH), whereas research is perceived as an underlying tool for supporting the overall justification of the CEE. It suggests that research is a challenging and sensitive issue because on the one hand, research is not included in the mission of the CEE, and on the other hand, the employees at Genombrottet hold appointments that allow research. At the same time the Instructions for CEE state that "The Director should work for the pursuit of high-quality research", which hints that CEE is expected to do research to some extent. It calls for several discussions and maybe a reformulated center mission that explicates the role and priority of research.

We are mainly puzzled over two things that we believe need attention:

1. ***The Research Scope:*** Based on the self-assessment report and interviews with Genombrottet's staff members, we find that Genombrottet makes a sharp distinction between applied, hands-on research conducted by regular teachers at LTH and more theoretically-based research conducted by Genombrottet. Arguments *in favor* of this distinction is that 1) the center staff does not find themselves qualified (at present) to perform applied research in teaching and learning, 2) Genombrottet has worked hard to promote a culture of scholarship among *the regular teachers* in terms of written reports, annual presentations of the reports, and a well-established and impressive database of reports, 3) Genombrottet has worked hard to promote a culture of scholarship among *academic developers* in order to contribute to their own continual professional development (Patel, 2014). Arguments *against* insisting on this sharp distinction is that the interviewed Heads of Departments, study directors and teachers/ETPs expressed a clear need for more research-based knowledge on their concrete teaching practices, which ideally should be produced by Genombrottet. The interviewed teachers and those responsible for teaching all voiced their enthusiasm about engaging in scholarly reflections, including the reports and the biannual conference and how it stimulates a more critical reflective dialogue among colleagues. However, they are often confronted with a number of practical challenges as teachers, and they experience a need for more evidence-based ideas on how to solve the challenges; more evidence than is provided at the pedagogical courses and in their own short reflection reports. The evaluation panel therefore sees a potential research gap that Genombrottet needs to discuss and perhaps close: can they identify with a developer-role in which they bridge applied hands-on and theoretical well-grounded research?
2. ***The Research Strategy:*** It is a bit unclear to us what role doctoral students play at Genombrottet. Are doctoral students mainly used for capacity building, e.g. as a recruitment channel for future academic positions? Or do they have an intrinsic value, e.g. producing research for the sake of gaining scientific knowledge? We address this issue because we identify a certain randomness in the titles/focus of research projects conducted by doctoral students at Genombrottet.

Suggestions for improvement of Genombrottet's research

Our suggestions revolve around three issues

1. **The Research Scope:** The interviewed teachers and department managers expressed a clear wish for applied, relevant and concrete research to become part of the CEE's repertoire and that Genombrottet's pedagogical courses in teaching and learning include this kind of research to a higher extent. Thus, we find it important that research at the center should not be too narrowly defined and focus on academic development. We recommend that the CEE in the long term also contributes to solid and practical knowledge to be helpful for LTH colleagues to increase their hands-on teaching performance. For instance, they could start by having a minor goal of co-publishing one peer-reviewed article biannually with a teacher from LTH. We believe the CEE staff has the necessary competences for doing this. For example, if a teacher approaches the CEE because he/she wants to redesign a bachelor course by use of online peer feedback, it is an obvious case for doing systematic follow-up research. The staff at Genombrottet knows much of the literature on peer feedback and thus, they can help identify a gap and write a 'state-of-the-art' section and suggest ways of designing the study, e.g. simply by use of comparing student evaluation data. This would be an excellent way to strengthen the link between research and development, increase the legitimacy of the developers, and to widen teachers' significant networks (Roxå & Mårtensson, 2009). To meet this expectation, an explicit research strategy is needed though, which we address below.
2. **The Research Strategy:** If doctoral students are intended as the main recruitment channel, then we recommend that Genombrottet decides on strategic research themes they want to focus on in the coming 5-10 years, while still allowing for some pragmatism and flexibility if candidates approach the center with their own funding and brilliant project ideas. Selection criteria for these research themes could for instance be driven by:
 - a) *Branding of the CEE:* would the center like to brand themselves as researchers locally, nationally and/or internationally? E.g. would they like to be renowned for academic development research, or for certain research methods, or for discipline-specific knowledge on teaching and learning in engineering?
 - b) *Demand-driven,* where teachers' practices at LTH would inform the research focus at Genombrottet. This could for instance be achieved by issuing a call among engineering teachers for evidence-based 'best practice' in Edu-it, peer-feedback, laboratory instructions, etcetera. Taking the wish lists of the departments into consideration, it may be beneficial for Genombrottet to focus their future doctoral research on the themes that are impactful for the departments and needed according to the Excellent Teaching Practitioners. Potential subjects mentioned during the interviews were i) integration of ethics in engineering education, ii) embedding digitalization and computational thinking in engineering courses or projects, iii) reducing gender bias in engineering educations, etc. Thereby, the visibility of the CEE within LTH would be enhanced, and the CEE would better profile as a Centre for *Engineering Education* in the outer world. In addition, it could increase the chances of raising (more) external research funds because the funding sources for educational research are richer and more elaborated within the STEM disciplines (e.g. Horizon and Cost). In general, public funding opportunities are limited for educational research within Higher Education, particular in Sweden.

Finally, we recommend that the center's Mission is reformulated in such a way that it explicates the role and priority of research.

2.4.4 Consulting and development

Genombrottet aims at strengthening the teaching and student learning in higher education organizations, LTH in particular, by providing support on various levels within the organization: from student union, individual teachers, teams of teachers, departments, program directors and faculty management up to the level of the Dean (self-assessment report). The approach that is followed is immersive: The more informed conversations about teaching and learning that take place across the various levels of the organization, the more aligned the thinking about education will be. It stimulates that the culture of scholarship of teaching and learning will be the natural habitat of the staff. And because staff takes the lead in doing things differently and adapt to changing environment or demands, the more improvement will happen. The sessions the panel had with staff from department management convincingly showed the positive impact of this approach. “CEE provides a common language about educational quality and development”, one of the interviewees said. All staff members we met were very much engaged with education, had high ambitions, and they were unanimously positive about the role of the CEE. “When educational problems or questions raise at department level, the CEE is available for help and responds adequately to all kinds of department requests”. The database of about 600 educational development projects is well-known and consulted by teachers.

The discussions with the Department Management also revealed points for improvement and opportunities for the CEE. The staff in the departments experience the CEE positively, but (always) reactive to requests from the department. The departments expressed their wish for the CEE to take also a more proactive role, develop as a platform for cross-disciplinary content or methods, actively support course evaluation tools or methods, provide alumni evaluation schemes, take the lead in selecting or customizing a collaborative e-learning platform, and (as already mentioned in section 2.3) recruit PhD students who focus on design-based research on authentic teaching contexts that are relevant and specific for their department. “CEE could elevate its status by providing research support and pedagogical expertise to teaching staff at the departments who are interested in performing research in their own education”, an interviewee said, “and organize inspirational conferences or seminars on educational topics that are of specific interest for one or more departments”. Also the CEE management expressed their wish to work towards more impact on engineering education at the faculty in the next five years.

In the session, with the department management we asked “What challenges or developments in engineering education do you see, where the CEE could provide support or guidance?” The subjects that were mentioned were widely spread. As expected, the subjects are quite specific for *engineering education* (Kamp, 2016) whilst members of the CEE management said they don’t have so much interest in discipline-specific pedagogical methods and solutions. Department representatives showed their interest in getting professional support on educational matter that are specific for the context of a department, or engineering education. A non-exhaustive list of subjects they mentioned were:

1. redesign of the classroom for collaborative learning and teachers of how to use such classrooms effectively,
2. integration of ethics in disciplinary engineering curricula,
3. embedding of cross-disciplinary education in disciplinary programs,
4. use of students as the change-agents for integrating digitalization in engineering education
5. upskilling teaching staff
6. practical implementations such as innovative digital questioning in online exams.

Evaluation of teaching – Course Evaluation

One way of evaluating quality of learning and teaching is the Course Experience Questionnaire (CEQ) by Ramsden (1991) that LTH uses systematically to evaluate most undergraduate courses. When analysing CEQ scores for four different years, results show that courses led by ETP teachers receive significantly better CEQ scores, especially regarding overall satisfaction and good teaching, than others. The CEQ data collection throughout the years it has been applied, verifies that ETP-led courses support high-quality learning and a deep approach to learning. For research purpose it is admirable that LTH has built the CEQ system for collecting comparable course evaluation data over long term, since the most challenging aspect of evaluating learning and teaching quality is at the actual course level. On the other hand, choosing one overall system that all teachers have to apply may automate the teachers' interest in the reflective process of evaluating teaching and learning within the course. To enhance and advance the cultural shift of interest in teaching at course level, we suggest to support teachers to engage in complementing the CEQ with innovative inclusive course evaluation procedures, that can be compared and researched.

National and international forerunners of pedagogical academies

LTH is both nationally and internationally renowned for pioneering a system for rewarding excellence in university teaching and academic development. Since the ETP system was introduced already in 2001 it has served as an inspiration to many higher education institutions in Sweden, and according to *Winka 2017*, another 25 reward systems have additionally been introduced between 2007 and 2017. LTH has also taken a national responsibility through the engagement of Thomas Olsson at the CEE and by the support of SWEDNET (the Swedish Network for Educational Development in Higher Education), in designing a national course for presumptive assessors of pedagogical competence. This course has been delivered at six occasions between 2010 and 2017, and is offered again this year. Still today despite these important efforts to systemic change in academia on national level, pedagogical rewards are not seen to be in parity to research accomplishments, when it comes to ranking for academic promotion or positions.

Therefore, it is extremely enlightening and definitely important to support pedagogical reward systems that include and highlight pedagogical leadership and competence in promoting systemic development of adult learning in higher education. We encourage LTH to continue to be an academic influencer nationally and internationally in promoting recognition of pedagogical rewards. To be a beacon for further development of criteria relating to pedagogical leadership and introducing several levels of encouragement are strongly emphasised as a recommendation from the assessment group.

LTH's Campus Conference on Teaching and Learning - *Inspirationskonferensen*

This biannual conference, organized by Genombrottet, has the purpose to be an arena for conversations on teaching and learning for the faculty, being a source for delivering printed proceedings and a venue for practice in giving presentation both in Swedish and in English. In December 2018, the 10th conference was offered, attracting around 100 participants. Some 20-30 presentations were given. Conference contributions have been researched (Larsson et al 2015) and found to have evolved over time. Later contributions were found to have clear focus on student learning, being written more coherently and more educational references were referenced. The concept has been successfully disseminated and picked up both within LU and nationally.

Throughout all our interviews the importance of this conference was praised. Some department heads encourage teachers and ETPs to contribute with papers and it was pointed out that publishing for the

conference is promoting the pedagogical link between evidence based practice and teaching and learning within a discipline.

There is a strong commitment by the leadership to support the development of the Conference and we also identified an eagerness from ETPs to be more involved together with the CEE in advancing the format and the recognition from participation. The evaluation panel sees the value of this activity also to be a further source for researching the practice of teaching within the LTH. Again the challenge to involve and engage teachers in all departments is apparent and needs to be addressed.

Suggestions for improvement of Consulting and Development

We recommend the CEE to take a more proactive role within LTH to consulting and development, and to enhance its interests and skills in pedagogical issues specific to engineering education. As we already have elaborated in sections 2.4.2 we believe some of these aims could be achieved by utilizing ETPs in engineering-education development and research. The issue of a taking more proactive role, and how such a role could be combined with the immersive, cultural approach, is one of the main topics of the remainder of the report.

3 Evaluation of CEE Governance and Organization

To understand how the CEE effectively can capture and meet the needs of the faculty, we found it important to evaluate the role of CEE in the governance and the organization of LTH.

The vision of the faculty of Engineering (LTH) at Lund University is captured in the Strategic plan: ***“Together we explore and create – to benefit the world.”*** Further it is also stated among the objectives that LTH by 2026 “should be at the forefront of educational development, and all teaching is to be characterized by a high level of educational expertise and a wide range of high-quality teaching methods and forms of assessment. To reach this goal one of the strategies mentioned is to build and reward expertise among its teaching staff in the development of teaching and supervision, as well as encourage a scholarly approach to teaching and learning, and active participation in the discussion of education at LTH.” It is extremely reassuring to see that the overall strategy of LTH explicit includes the valuable role of the CEE.

When the Centre for Engineering Education (CEE) was formed on January the 1st, 2016, it was with the purpose; ***“To strengthen the LTH’s activities in education, research, and outreach through critically reviewed and scientifically based development work, skills development, and management support. The Centre for Engineering Education will also conduct education, research, and outreach that has a faculty-wide character.”***

(Instructions for Centre for Engineering Education, a decision taken by the Board of the Faculty of Engineering at Lund University on November 2nd, 2015, Appendix 1).

The CEE is a congregate of on one hand, the successful and well established pedagogical development section – Genombrottet established in 2005 – and on the other hand, a handful of pedagogical oriented activities, earlier organized within the faculty administration, joint into a single unit under the faculty board. In Figure 1 (in the Appendix 4) the position of the CEE in the overall organization of the faculty is illustrated. However, interactivity between the different units of LTH and the CEE, are not visible in this organization scheme.

According to the CEE Instructions (Appendix 1), the CEE board has the overall responsibility for the CEE activities, through setting detailed guidelines, budget proposals, annual activity plans and by deciding on quality assurance procedures. However, we could not identify a statement, or an outspoken commitment from the CEE management at the site visit, that demonstrated an explicit awareness of how the activity based mission statement for the CEE is connected with the overall vision for the faculty. This may not be an issue as long as the current CEE management team is on board, but we foresee that it can be a challenge when a shift soon will take place due to multiple retirements and recruitment of new staff. We are aware of the fact that the Instructions emanate from 2016 and the Strategy for the faculty is aiming for 2018-2026.

The governance of the CEE is complex, and today the Chair, appointed by the Dean, is an external member from another faculty at Lund University. According to the self-assessment report, even if the CEE board submits an annual report to the faculty board, there is no actual dialog set in stage for the preparation of the annual activity plan, neither between the CEE board and the Dean nor between the CEE board and Faculty Board. The evaluation panel could confirm these gaps that need to be addressed through regular communication channels between the leadership (the Dean, the Faculty Board) and the CEE board and the CEE management and staff.

The CEE has currently six employees, covering in total 4 full time positions. In addition, five teachers, including the director, are employed by a department, either within LTH or from the Centre for Languages and Literature within LU. It is noted that there are no formal agreements with these LU departments and the CEE.

As mentioned in section 2.3.2, the evaluation panel identified that the CEE is represented in the Research Board (FUN), while there is not a corresponding position for the CEE in the Education Board (LG GU). We see this as an important position for embedding the role of the CEE in the LTH organization and governance. By including a position from the CEE at the LG GU, LTH also will ensure the benefit of the academic education expertise at the CEE. Securing the CEE's representation at the LG GU, the CEE will be the resource for contributing to the improvement of the quality in teaching and learning and promoting research integrated education at the whole Faculty.

In relation to AHU (Division for higher education development at Lund University) the CEE and Genombrottet in particular, has taken a relatively independent role as an academic development unit at faculty level. From the discussions with the Head of AHU we understood that each Faculty at the University has its own unique educational culture and preferred pedagogical methods, and therefore centralization of educational support or consultancy is not trivial. We were also certified that the CEE and Genombrottet are extremely valuable for the overall academic development at LU.

Suggestions for improvements in transparency of governance and internal communication

Considering that Genombrottet was the pedagogical development unit that the CEE was shaped around, these first years, the organization of the CEE has had to go through adjustments both in relation to the governance of the faculty itself and to the well anchored change theory of Genombrottet. The evaluation panel could not in our various meetings at the CEE, identify a commonly expressed stated vision for the CEE connected to the mission statement, which could serve as a guide for directing further development of the CEE. Therefore, we recommend LTH:

- to develop a CEE Vision Statement in close collaboration with the Faculty Dean, the Heads of Departments, ETPs, teachers/researchers and students. It should answer the question; "where does CEE aim to be in five to ten years from now?". We believe such a vision would serve as a source of inspiration and motivation for all CEE's stakeholders.
- to reformulate the Mission Statement in alignment with the Strategic plan for the faculty and explain what activities will bring CEE to where it wants to be in 2026. The vision and mission statements with a secure and widespread support among the stakeholders, will enable the development of clear strategies with respect to training, research and development as well as outreach activities.
- to establish systematic communication/dialogue between the CEE board, the Dean and Faculty board. We see this especially of importance for the accountability when appointing an external chair of the CEE board.
- to appoint a CEE representative on the Education Committee (LG GU). If preferred such a representative could have a role within LG GU, where he/she would not partake in its formal decisions.

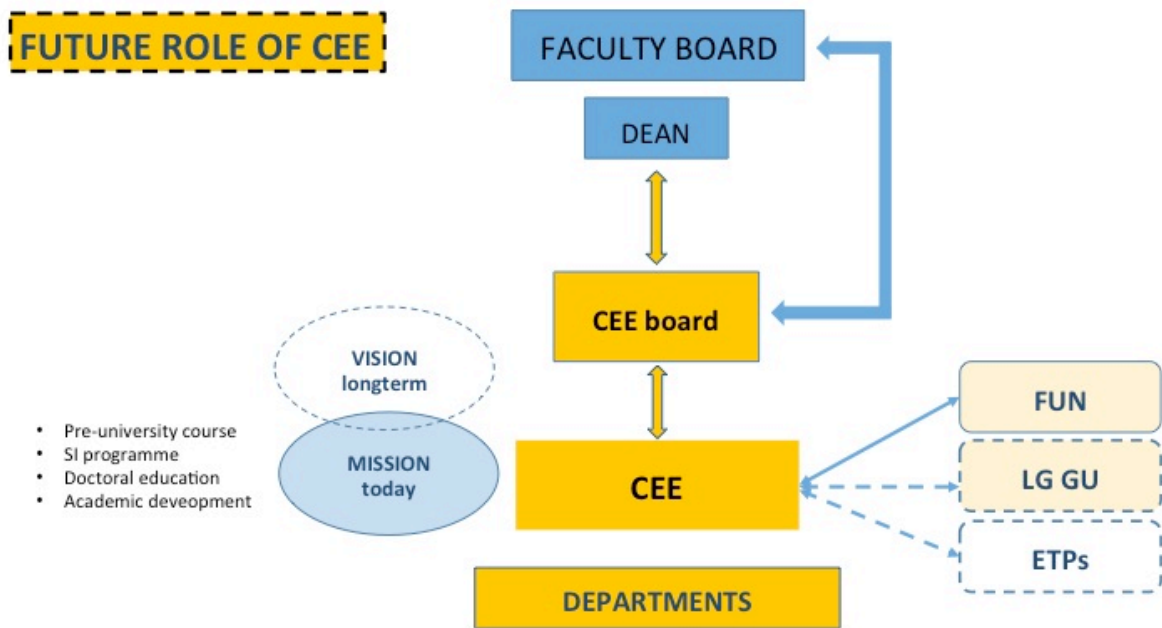


Figure 1: Organization diagram depicting the suggested integration of the CEE in the organization of LTH .

4 Conclusions and Future Perspectives

The evaluation panel is deeply impressed with the quality and reach of the activities carried out by the CEE. Our impression from the CEE's self-assessment report and from data collection during our site visit in Lund, is that the CEE achieves a lot with limited resources. We also find the CEE staff to be highly dedicated and engaged. Thus, it is with humbleness that we raise some discussion points and make suggestions for improvements.

Overall, we interpret the CEE's activities as a token of an underlying cultural change approach to academic development (Kezar, 2014). Our interpretation is based on examples such as the SoTL activities among LTHs' teachers, the many written artifacts, the bi-annual inspirational conference, the pedagogical academy, the award system, and the ETPs. The achievements from this approach are impressive! However, to harness and refine the gains, the CEE could consider *adding* a political change approach (*not replacing* the cultural change). For example, the CEE could insist on more regular meetings with the Dean and/or Pro-dean. In line with this suggestion, the CEE could be more proactive in feeding the LTH management with ideas, inspiration and visions. This would, of course, require that the leadership welcomes an interest in the ideas presented, listens curiously, follows up on initiatives taken, and legitimizes them by backing them up, for example, in terms of providing resources.

In this way, the CEE could be assigned more power and influence without directly being in the line management. We mention this specifically, because it seems as if there is an unresolved identity dilemma embedded among the CEE staff. On the one hand, the CEE staff takes pride on being an independent unit (outside the faculty management), to work informally, bottom-up, and to slowly and slightly alter the values and beliefs about teaching and learning at campus. On the other hand, they ask for more influence and legitimacy, more information, and more backup from the faculty leadership. This dilemma might never be solved - at least not easily or immediately - but we recommend that the CEE and the faculty management discuss and try to bridge the two seemingly conflicting interests. In addition, we believe that including the HoDs in setting the short-term agenda for activities could be one way to involve the departments actively.

The CEE mission includes a number of (somewhat detached) activities, mainly because that is how it was formed. One of the core activities is academic development represented by Genombrottet. However, Genombrottet appears to us to be a unit within the unit that is more internationally acclaimed than the rest of the CEE. It is potentially a problem, because it may be confusing to both external and internal stakeholders. To be effective in the long run, we suggest a co-created vision and mission for the CEE in line with the LTH strategy for 2026. We also suggest that LTH decide whether the CEE or Genombrottet is to be the name used. The CEE could be merely an administrative entity or it could be highly visible to the outside.

As mentioned above, the CEE staff members are dedicated and perform on a very high level; thus, they seem indispensable. However, continuity and recruitment of new staff must have high priority at the faculty in the near future. Some of the CEE's activities are quite vulnerable because of its limited staff; for some activities a single person runs "the whole show". Our view is that the CEE is crucial for the future of education at LTH, a view that was expressed by the Dean at the site visit. Thus, the CEE should not be viewed as "any other department" at LTH, and the support of the LTH management and HoDs in finding forms for supporting a generation transition is necessary.

Again, we stress that ETPs are a highly valuable but under-exploited source for educational research and innovation, at course, program and department level.

We conclude our report with a quote from the Dean's report to the Faculty board at its meeting on February 8, 2019 (translation from Swedish by the panel):

“One of our most important tasks is to ensure that our programs have high quality and give our students an effective education. Program reviews and quality assurance are a means to this end. LTH needs to a larger degree to create an atmosphere driven by rethinking and enthusiasm for program development.”

We are convinced the CEE does already play an instrumental role in creating this atmosphere and enthusiasm especially at the course level, and that this role could be enhanced and developed in the future. As mentioned in section 2.4.4, we believe for that to happen at the program level there has to be an enhanced engineering-education profile within the CEE.

5 Thank You

We, the evaluation panel, would like to express our sincere gratitude to Christina Åkerman and John Jönsson for the excellent support we have received during this evaluation. We also appreciate the engagement and openness among all representatives that we met during our site visit.

June 28, 2019

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References

Kezar, A. (2014). *How colleges change. Understanding, Leading and Enacting Change*. New York & London: Routledge.

Roxå, T. & Mårtensson, K. (2017). Agency and structure in academic development practices: are we liberating academic teachers or are we part of a machinery suppressing them? *International Journal for Academic Development*, 22:2, 95-105

Stigmar, M. & Edgren, G. (2017). Performing research at university centers for academic development – an explorative case study in Sweden, *International Journal for Academic Development*, 22:3, 199-210

Patel, F. (2014). Promoting a culture of scholarship among educational developers: Exploring institutional opportunities. *International Journal for Academic Development*, 19, 242–254

Roxå, T. & Mårtensson, K. (2009). Significant conversations and significant networks – exploring the backstage of the teaching arena, *Studies in Higher Education*, 34:5, 547-559

Wichmann-Hansen, G., Godskesen, M., Kiley, M. Successful Development Programs for experienced Doctoral Supervisors - What does it take? *Internal Journal of Academic Development*, In print.

Ramsden P. (1991). A performance indicator for teaching quality in higher education: The Course Experience Questionnaire, *Studies in Higher Education*, 16:2, 129-150

Larsson, M, Anderberg, E. and Olsson, T. (2015). Researching the transformation in the Scholarship of Teaching and Learning through teaching portfolios and conference papers: A reflection at the institutional level. In Booth, S. and Woollacott, L. (Eds): *The Scholarship of Teaching and Learning in Higher Education: On its constitution and transformative potential*, SUN MeDIA, Stellenbosch

Kamp, A (2016) *Engineering Education in a Rapidly Changing World: Rethinking the Vision for Higher Engineering Education*?. (2nd revised edition ed.) Delft: TU Delft, Faculty of Aerospace Engineering.

Appendix 1 CEE Instructions

These instructions are available in Swedish and English at the CEE web site. The evaluation panel corrected some typos in the translation to English shown below.

This is a translation of Föreskrifter för Centre for Engineering Education

Instructions for Centre for Engineering Education

The following instructions are in effect as of 1 January 2016.

The Board of the Faculty of Engineering at Lund University has decided the following based on chapter 2, §5 in the Higher Education Act (1992:1434).

The issue has been subject to negotiation according to the Employment (Codetermination in the Workplace) Act §11, 15 September 2015.

Organization

Centre for Engineering Education is part of the Faculty of Engineering and is a unit that reports directly to the faculty board.

Background

The Centre for Engineering Education takes existing pedagogically oriented activities, currently organized within the faculty administration, and gathers them in a single unit directly under the faculty board. The change is motivated by the fact that the Centre for Engineering Education, with its mix of supportive and teacher-led education, will be able to more effectively support the faculty's undergraduate education, doctoral education, and research.

Objective

The Centre for Engineering Education aims to strengthen LTH's activities in education, research, and outreach through critically reviewed and scientifically based development work, skills development, and management support. The Centre for Engineering Education will also conduct education, research, and outreach that has a faculty-wide character.

Mission

The Centre for Engineering Education should:

- Perform academic development work within the framework of Genombrottet, as decided by the faculty board (2005-05-26).
- For all doctoral education disciplines at LTH, conduct training with a special emphasis on the degree objectives not included in the dissertation work, as well as education and training for docent candidates, and assessments in support of doctoral education.
- Conduct competence development activities with focus on education and research, especially regarding the qualifications of university staff.
- Run the Supplemental Instruction program at LTH.
- Deliver foundational programs for recruitment to LTH's education program.
- Develop and perform other activities that are consistent with the purpose of the Centre for Engineering Education.

All activities are to be aimed at strengthening and supporting LTH as a whole, as well as contributing to the development of knowledge in learning and academic development at Lund University. The mission includes maintaining a close dialogue with faculty management, committees, departments, individual teachers, the faculty office, the student union, and other stakeholders, with the purpose of capturing and meeting the needs of LTH. A priority area is to cooperate with and create conditions for

enhanced collaboration with other academic development initiatives at Lund University.

Board

The Centre for Engineering Education shall have a board. The board has overall responsibility for the centre's activities, sets out detailed guidelines, sets out budget proposals and the annual activity plan, and decides on the forms of quality assurance. The director should submit an annual report to the faculty board.

The board should consist of eight members as follows:

- Chair
- Four members from LTH
- One member from outside LTH
- Two student representatives

The Dean appoints the chair and other members to the board on recommendation from, for example, the director. The term of office of the members of the board, with the exception of the student representatives, is three years. The board shall convene at least three times each year.

The student representatives are appointed according to the rules in § 7 in the Student Union Act.

Director

The Centre for Engineering Education has a director who is also the head of the centre. The director should work for the pursuit of high-quality research, education and other activities, including seeking external cooperation projects and external funding. The director represents the Centre for Engineering Education within and outside the university.

The director is appointed by the Dean for a period of three years. The director is the main rapporteur at the board of Centre for Engineering Education and has the right to attend and participate (speak, make proposals) in meetings.

Acting and deputy director

The Center for Engineering Education should have an acting director appointed by the board of the Center for Engineering Education, on the recommendation of the director.

The Center for Engineering Education may also have a deputy director who may also serve as acting director.

The deputy director should then have a special assignment, which should be set out in writing. The deputy director is appointed by the board of the Center for Engineering Education, on the recommendation of the director.

Financing and budget management

The Center for Engineering Education is financed by funds designated by the faculty board and other means that may be provided. The different activities should be divided into separate cost centers.

Financial management follows the principles that apply to a department.

Staff

At the Centre for Engineering Education, staff may be employed. Recruitment of staff takes place according to the same procedure and under the same rules as elsewhere at the university.

Administration

The Centre for Engineering Education should not build its own administrative functions and an agreement regarding the provision of such services should be made with the faculty administration.

Change of instructions

Changes in these instructions are made through decisions by the Dean.

/ Signatures

Appendix 2 Genombrottet Framework

The Genombrottet framework (2005-05-26) is available only in Swedish so the evaluation panel translated it. Here is our translation of the board decision.

The pedagogical support functions (Genombrottet) shall be developed and communicated within LTH. The content is the following:

1. **HE pedagogical education** shall give the theoretical foundation and the framework for the pedagogical practice of the teachers.
 - a. The departments have the goal that the teachers should participate in HE pedagogical education of, in the mean, 1.5 weeks per teacher during the period 2006-2008.
 - b. Genombrottet has the task to develop new forms of HE pedagogical education that are particularly cost effective.
2. **Pedagogical consultancy support.** LTH's pedagogical consultants, most of whom are lecturers, shall support specific development and follow-up activities. This is a free resource within LTH.
3. **Evaluation activities**
4. **HE pedagogical, practice-related research, knowledge spreading and meeting places.** Several teachers at LTH do research on their own and their colleagues teaching from developmental motives.
5. **Evaluation of pedagogical merits** shall be performed systematically within the LTH Pedagogical Academy to which teachers can be admitted after an evaluation process. A major piece of evidence is the teacher's ability to critically and knowledgeable reflect on his/her pedagogical practice, and apply these insights into his/her own teaching.
 - a. The pedagogical academy will continue according to the initial ambitions with the same economical rules as before, but with revised criteria for admissions (see attachment). The costs shall be taken from the education funds.
 - b. LTH decides to adopt a unified methodology for evaluating pedagogical competence, in line with the Lund University guidelines, and the introduction of pedagogical peer evaluation shall be handled by staff within Genombrottet.

Appendix 3 Site Visit Schedule

February 26				
From	To	Meetings with	Part of CEE	CEE Purpose
09:00	10:30	Planning		
10:30	11:00	Students/alumni - pre-university year and SI leaders	Pre-university year, SI	Delivering pre-university courses for recruitment to LTH's education program
11:15	12:00	Planning		
12:00	13:00	Lunch with Dean and Deputy Dean at LTH	Management of CEE	
13:15	14:30	Doctoral students	Doctoral education support	Conducting training, with a special emphasis on the degree outcomes not included in the dissertation work, for all doctoral education disciplines at LTH, as well as education and training for docent candidates, and assessments in support of doctoral education.
15:00	16:00	Supervisors - doctoral education	Doctoral education support	Conducting training, with a special emphasis on the degree outcomes not included in the dissertation work, for all doctoral education disciplines at LTH, as well as education and training for docent candidates, and assessments in support of doctoral education.
16:00	17:00	CEE	Foundation year / SI	Delivering pre-university courses for recruitment to LTH's education program Running the Supplemental Instruction program at LTH
19:30		Dinner with Deputy Dean and members from CEE at Kulturen (Tegnérplatsen 6)		

February 27				
From	To	Meetings with	Part of CEE	CEE Purpose
09:00	09:30	Planning		
09:30	10:30	Department management - interview 1	Academic development (Genombrottet)	<ul style="list-style-type: none"> - Conducting competence development activities with the focus on education and research, especially regarding the qualification of university staff. - Carrying out academic development work within the framework of Genombrottet, as decided by the faculty board. - Development and performing other activities that are consistent with the purpose of CEE.
10:45	11:30			
12:00	12:45	Lunch with the head of AHU (Division for higher education development at Lund University)		
13:00	14:00	Department management - interview 2	Academic development (Genombrottet)	<ul style="list-style-type: none"> - Conducting competence development activities with the focus on education and research, especially regarding the qualification of university staff. - Carrying out academic development work within the framework of Genombrottet, as decided by the faculty board. - Development and performing other activities that are consistent with the purpose of CEE.
14:15	15:30	CEE	Doctoral education support Academic development (Genombrottet)	<ul style="list-style-type: none"> - Conducting competence development activities with the focus on education and research, especially regarding the qualification of university staff. - Carrying out academic development work within the framework of Genombrottet, as decided by the faculty board. - Development and performing other activities that are consistent with the purpose of CEE. - Conducting training, with a special emphasis on the degree outcomes not included in the dissertation work, for all doctoral education disciplines at LTH, as well as education and training for docent candidates, and assessments in support of doctoral education.

Appendix 4 LTH Organization

Figure 2 shows a diagram of the LTH organization including the CEE taken from the LTH web site. The nomenclature for the LTH organization in English is somewhat confusing. The Research Programmes Board in Figure 2 is also called Postgraduate education committee. So we also use the Swedish abbreviation FUN in this report. The Education Board in Figure 2 is also called Management group for undergraduate education. Therefore, we also use the Swedish translation LG GU in this report.

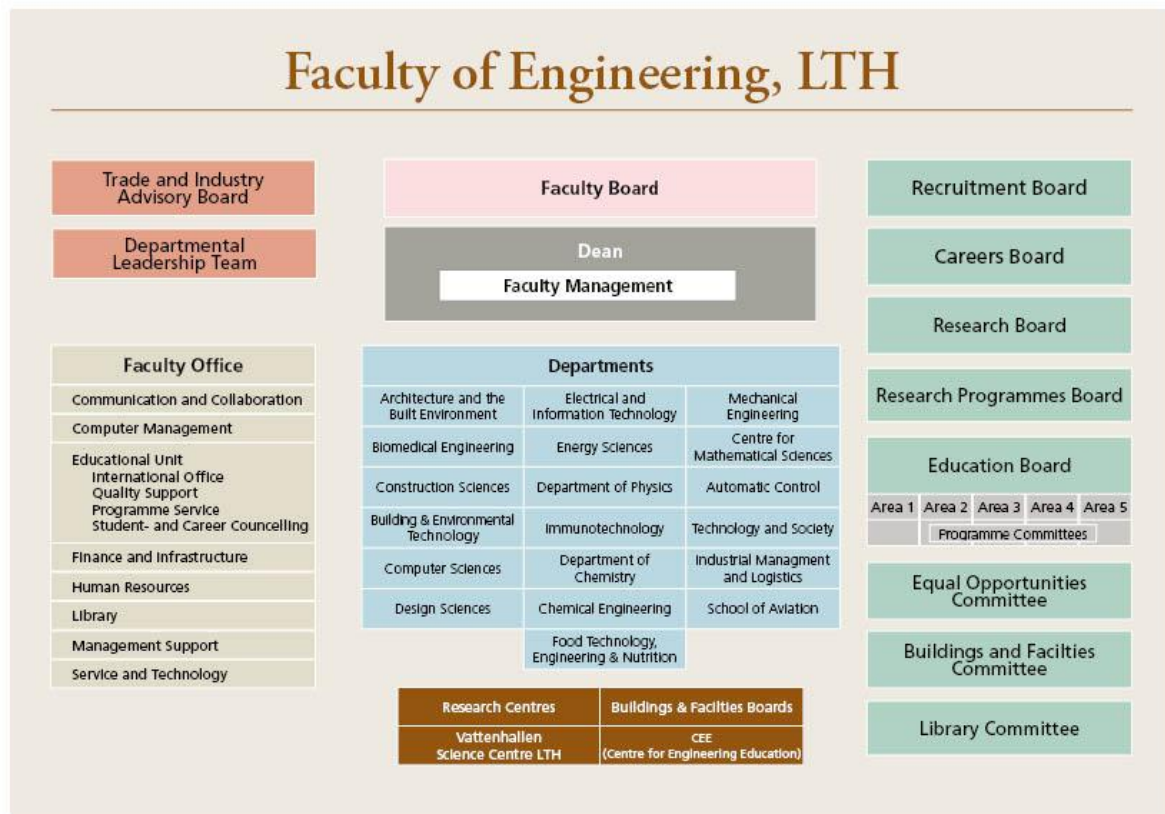


Figure 2 This diagram from the LTH web site shows the LTH central organization where the CEE is a part, but it does not show how the CEE is connected to other parts of the organization.