Below are examples of how some of the content of the pedagogical portfolio according to Chalmers instructions can look like. Please be aware that the examples are not complete since some sections of the instructions are not included, as for example section 1 and 7.

2. Eduation

b) Pedagogical training

Much of my understanding of teaching and learning is a result of reading general philosophical texts as well as an active reflection on my direct experiences. As I perceive teaching as a practical wisdom, my development and knowledge has been greatly influenced by discussions with colleagues. Formally I have 5 credits in university level teaching and learning, though I have also studied texts on the views of Piaget and Vygotsky on how humans acquire knowledge. I've also followed the evidence-based approach to pedagogy and didactics.
Passed course:
2011, University X, Basic course, 5 credits.
The course provided foundational knowledge of learning theories for university level education and of society's goals and regulations for the educational system. Another aim of the course is to provide ethical awareness in relation to issues such as view of human beings, approach, responsibility and the rule of law. A certificate showing my passing grade for this course is enclosed as attachment X.

3. Experience of teaching and supervision

Experience of teaching example 1
2004 – present University X master-level mandatory course
Course title (7,5 HEC).

Participants*:* 2004 – 33, 2005 – 50, 2006 – 46, 2007 – 35, 2008 – 47, 2009 – 36, 2010 – 41, 2011 – 45 and 2012 – 41 students.
Method of teaching*:* lectures, case discussions, written group assignments around real but shelved technology ventures.
Examination*:* Written exam and written group assignments.
Course evaluation*:* questionnaire with open questions 2004-2009, standard questionnaire 2010-present; weekly diary to program coordinator.
Relation to contemporary research*:* research articles part of readings and classroom discussions. Articles list updated annually.
My role and effort*:* Co-creator 2004, examiner and lecturer 2004 – 2008 altogether 60 hours/year, course leader, examiner and lecturer (2009 – 2012) altogether 110 hours/year.

2004 - present University X master-level mandatory course
Course title (15 HEC).

Participants: 2004 – 33, 2005 – 50, 2006 – 46, 2007 – 35, 2008 – 47, 2009 – 36, 2010 – 41, 2011 – 45 and 2012 – 41 students.
Method of teaching: Project-based course with written and oral individual and group assignments around real but shelved projects, including role-plays

with practitioners. Seminars and workshop help students relate to theory and to issues around ethics and sustainable development.

Examination: Pass/fail or grading of individual and group assignments.

Course evaluation: questionnaires with open questions 2004-2009, standard questionnaire 2010-present, weekly diary to program coordinator.

Relation to contemporary research: course includes research seminars in smaller groups. Educational tools are based on developing research. Course also builds on contemporary research around learning development (ex. use of appreciative inquiry methods, learning styles and learning cycles, including reflection).

My role and effort: co-creator 2004, examiner, lecturer and assignments responsible 2004-2008 altogether 60 hours/year, lecturer and assignments responsible (2009 – present) altogether 40 hours/year.

Example 2

Since 2009 I have been employed at University X, City X, Country X, and here I have taught at least one course every semester except one.

Fall 2009, University X, course title, Year 1, 7.5 credits, 30 students.

I had primary responsibility for this course, including grading. The course ran for 7 weeks, and consisted of 8 hours of integrated lectures and tutorials and 2 hours of teacher-assisted individual working sessions per week. Course examination consisted of continuous individual assessment by interviews. The class performed course evaluation in the form of a 1-hour discussion at the end of the course. No written documentation results when this kind of procedure is used. Attachment X contains a verification of this as well as a judgment of my performance by a Director of Studies.

Fall 2009, University X, course title, Year 1, 7.5 credits, 120 students.

A team of teachers taught this course in collaboration. The class was divided into three groups, each consisting of approximately 40 students. The course ran for 14 weeks. I had responsibility for 2 hours of lecturing per week for all groups in plenum for the first 7 weeks. In addition to this I had tutorials 2 hours per week for the group I was assigned for all 14 weeks. The assessment consisted of a mid term written exam and a final written exam after 14 weeks. The team of teachers in collaboration prepared the examination. Course evaluation was performed using the university's standard web based evaluation form, followed by a discussion in a meeting with students summoned by a university official and resulted in a written document, enclosed as attachment 4.

Fall 2010, University X, Topic1, Ph.D. level, no credits, 15 students.

During a visit at the Math Centre in City1 I taught a one-week course in Topic1 for Ph.D. students as part of a larger course at the Math Centre. Professor X performed the examination of this course. To my knowledge there was no course evaluation. Attachment 5 contains a verification of my participation by professor X.

Fall 2010, University2, Discrete mathematics, Year 3, 7.5 credits, 150 students.

I had primary responsibility for this course, including grading. The course ran for 7 weeks, and consisted of 6 hours of lectures, 4 hours of tutorials and 2 hours of lab sessions per week. Course examination consisted of hand--ins and a final oral exam. Course evaluation was performed using the university's standard web based evaluation form, followed by a

discussion in a meeting with students summoned by a university official and resulted in a written document, enclosed as part of attachment

Experience of supervision *example 1*
2010, University X, course title, Master's thesis, 30 credits, name of student.
I was both (the sole) supervisor and examiner for this Master's thesis. The student and I met 1-2 hours per week for a period of four months. After graduation I continued to meet the student to support a revision of the thesis to get it in shape for publication. The revision has appeared as Title, Journal, Vol, 2012. This is all verified in attachment X, by Professor X.

2011, University X, course title, Master's thesis, 30 credits, name of student.
I was the supervisor of this thesis. Professor X was the examiner. I met the student for 2 hours every second week for a period of five months. A verification of this is included as attachment X written by a Director of Studies.

Example 2
I have been supervising, co-supervising and/or in the committee for the following students with delegated responsibility as main supervisor for X and X (see Attachment X):

2008-2010	Co-supervisor for X who passed his PhD in 2010 with the thesis: title of thesis. (See attachment X for a reference). X is currently a director at X.
2010 – 2012	Co-supervisor for X who passed his PhD in 2000 with the thesis: title of thesis. X is currently a full professor in X at X.

Example 3
Main and co-supervisor to PhD for
• X, title of thesis, awarded PhD February 2007. External examiner Prof. X, Department of X, University X. I formulated the project together with Prof. X and the company X. Supervision about 10% of my working hours. De-facto main supervisor although formally co-supervisor to PhD (main supervisor Prof. X, see reference letter X).
• X, title of thesis, awarded PhD April 2004. External examiner Prof. X, University X. I formulated the project together with Professor X. Project Supervision equivalent to about 10% of my working hours. Project supported by the Swedish Research Council (VR). Main supervisor Prof. X, see reference letter by X.

4. Your pedagogical activites: approach, reflection and development

Reflection on my pedagogical activities and basic pedagogical outlook

Example 1
My general view on teaching, and education and studies in general, is that the aim is to enhance the students' potential to act in expected as well as unexpected situations. An important aspect of this, with direct bearing on teaching, is the concepts that are treated in the curriculum. Properly acquired they will empower the student with new and greater potential to act.

Based on this view, I've come to focus my attention in teaching on what I believe are known as threshold concepts. Some concepts in mathematics are quite easy to accommodate. An example of this would be the concept of addition, and it's not a coincidence that teaching of mathematics starts off with this. Sometimes concepts are divided into two categories: those

that you easily accumulate and those that you have to accommodate. Learning concepts in latter category includes a revision of previous thinking and is generally harder to acquire than the former, which just adds to existing knowledge. What I understand as threshold concepts are not easily put in either of these two categories. In mathematics there are often two flavours of each concept, both equally important. One is its intuitive understanding and the other one the operational aspect. Often enough, the intuitive understanding, even of threshold concepts, is easy to grasp while the operational side is the hard part. Take for example the concept of limit, which is a pivotal idea in mathematics. The intuitive understanding of this is not hard, but the operational definition is a hassle for most students. I think that a general feature of threshold-concepts is the way they build on, and reorganize previous thinking and experience, but that they generally don't call for a revision of previously acquired knowledge.

To further indicate how this has implications for my way of organizing teaching, I will try to explain my view on concept formation, in particular when it comes to threshold concepts, in a figurative way. Imagine previous knowledge as a collection of unrelated packages. The game then is to integrate some of these into a higher-order package, in some self-organizing context-sensitive way. A beautiful thing in mathematics is that once this higher-order package is in place, cumbersome details that previously only could be acquired by rote learning all of a sudden become obvious and can be recalled with ease. A nice example of this is the addition formulas in trigonometry, which are obvious once polar representation of complex numbers is mastered. If you follow my line of thinking, an important aspect then becomes how you best organize teaching to facilitate for students to achieve this self-organization of previous knowledge, and how you make sure that this knowledge is already in place.

Before passing on to the interesting part, let me dwell on the latter problem. I usually try to plan my tutorials in a way that leaves plenty of time for students to ask questions. When planning the course I try to pick problems in the textbooks which are of two kinds: exercises that are designed to capture misunderstanding or lack of basic understanding on the part of the student, often of an algorithmic nature, and, on the other hand, those which capture a difficulty with acquisition of new concepts. Both are equally important, and note that I think that rote learning is an important temporary aspect in concept acquisition, despite the harsh criticism this has attracted from e.g. one party in the "Math War" in the US.
When answering questions on exercises individually during tutorials I have two different strategies, depending on what the student has achieved so far. When the student reveals profound misunderstanding or lack of knowledge, I try to use Socratic dialogue to guide the student. On the other hand, when a student shows signs of almost having solved the exercise, and is missing just a single piece or two, I use my scratch pad, which I always bring along, to basically solve the exercise. The reason for this drastic approach is that this method usually evokes the Archimedean Eureka effect, when the student notices the missing piece of the puzzle in his or her solution. In this case the situation is in what I believe Vygotsky called the zone of proximal development, and I'm erecting the scaffolding.

Now I move on to describe how I try to facilitate the achievement of self-organization in students' concept acquisitions. An important aspect is that the student him or herself can only achieve this stage. My roll is to stimulate and facilitate the process. What makes packages of knowledge reorganize to form parts of a higher order package? I think the answer is internal feedback in context sensitive situations. In planning the course this is where constructive alignment and formative examination plays an important role. I try to organize different activities alongside lectures and tutorials during the courses I teach, predominantly in the form of hand-ins, quizzes and computer labs. One problem with hand-ins is to make sure that the student really has mastered the exercises and not gotten a 'free ride' by having a fellow student solve them. Another is that it's quite time consuming to do the grading and

provide relevant feedback comments. A positive thing is that when students collaborate I'm actually using them as a resource in teaching, which is good for both strong and weak students. Regarding computer labs, they give the students the opportunity to experiment and get immediate feedback, but a necessary condition is that the instructions for the lab are really good. It is also a good opportunity to discuss material and concepts with the lab supervisor.

Example 2

Important for me is that my teaching and courses are characterized by: good organization, clear and well established aims of the whole course as well as of every teaching activity, relevance for the study program and for the industry, well prepared demonstrations to show on what the theory can be used. The importances of giving the students clear learning outcomes and relate to real world problems have become increasingly more obvious for me. Therefore, at each lecture, assignment etc. I begin with presenting and discussing the learning outcomes of the specific activity and put a lot of effort to relate theory, examples and numeric to real word phenomena and products. Throughout, the pedagogical principle is phenomena before abstraction. This to relate to reality and create motivation. Equally important is repetitions/reflections and at the lectures I always connect to previous lectures and sometimes to previous courses. Then in the end of lecture I try to reflect a little on what we have done. I encourage the students to ask questions at any times, at lectures, labs etc. and at office. I have no consulting hours but obtain an open door policy. During the lectures I frequently put questions to the students, e.g., I ask, "how should we begin to work on this problem?" Then I ask small questions along the way. This to get interaction at the lectures. It is also important for me to be involved in labs and tutoring of students. Obviously, teaching in small groups gives better contact as well as facilitates and improves learning and teaching. These are also great opportunities for me to learn what is difficult in the course and how to improve the course as well as teaching. At these occasions I also consider it very rewarding to coach students in their learning. Generally, I am convinced that we need to reconsider the role of the teacher and transfer focus from monologues at lectures to more of dialogue in smaller groups. I have for a long time been clear over the importance of detailed student learning outcomes of a course and I have put a lot of efforts to formulate them for my courses, see Appendices X. This helps me to plan the course, the teaching activities and the examination and most important, it guides the students through the scope of the course. Also, as the head of the program, I have formulated detailed program learning outcomes and connected them to the courses through a program design matrix, see Appendix X. This helps me to plan the curriculum and order the courses from the departments. It also demonstrates the main thread of the program and how the courses are connected. This also helps teacher of the program to plan their courses and teaching activities and gives the whole picture of the program to students and teachers.

Recently, I started to realize the importance of aligning the learning outcomes with the teaching activities and the examination. I did this for the course X. I used design matrices to align the learning outcomes with the teaching activities and the examination, see Appendix X. It helped me to plan the examination and to ensure that learning outcomes were assessed. The students were satisfied; they claimed that they were clear on what they needed to learn and that it relieved the stress on the final exam. On the other hand, it reduced their freedom and enforced them to work continuously with the course. This resulted in a quite high number of students dropping the course. Course evaluation is essential to improve the quality but also for the whole study program. In the improving/planning courses as well as in the program I use the course evaluations. The course evaluations were the major input when reforming education, developing and implementing specific CAD and Mat lab courses and reforming the sustainability education. Moreover, the course evaluations are important tools for me as head

of program when ordering courses from the departments.

I strongly believe that the duty of the teacher is to convey the joys of learning and create enthusiasm and a supportive environment. A good learning situation is when the students know what knowledge and skills that are required and are convinced that they are relevant and up to date. Further, the teacher should be demanding and put clear and stable goals that the students understand are obtainable. In the end, what is important is the work of the students. All students can perform well and the teacher's work is of great importance to this without it being necessary to move the responsibility for learning from students.

To summarize, cornerstones in my teaching are:

• Create order. Plan and organize courses well. Formulate clear goals, prepare learning situations well, update course materials and websites to avoid administrative problems, and both students and teachers can focus on knowledge and skills.

• Encourage students to put questions any time and allow time for discussions.

• Engineering is a professional degree and teach to prepare students for successful careers.

• Integrating general engineering skills (e.g., communication, teamwork, intellectual property and sustainability) in the courses, where they are needed and with a clear progression according to plan.

• Phenomena before abstraction. I always start a lecture by showing a practical phenomenon or a major application and then go through the theory and the models needed.

• Transfer focus from extensive training of special problems with in before known solutions to training of more open general problems.

• Solve the complete problem, i.e., from choosing model, putting forward mathematical equation describing it, solving theses equations and simulating to assess the quality of the model and the solution.

• Use modern computer tools for design, computations and simulations directly in the basic courses. This is to make it possible to study complex and realistic problems but also to visualize and thereby enhance understanding of phenomena and theory. This has also been shown to create motivation.

• Collaborate between courses for example by having common computer exercises and laboratory projects.

Example 3

I will focus here on theoretical insights around pedagogy. Above, I have given account for my pedagogical studies, study tours, etc. Today there is increasing consensus in my field that if the objective is to generate individuals capable of practicing, then a preferred pedagogy is learner centred, interdisciplinary, process-based, co-creation oriented, experiential and socially situated (Mwasalwiba, 2010, Kyro, 2008, Gibb, 2011, Cotton, 1991, Ollila and Williams-Middleton, 2011). In this regard there is strong resemblance with a progressive pedagogy where social interaction, co-construction of knowledge, social immersion and collaborative learning are emphasized (Jonassen, 1999, Tynjälä, 1999, Woods, 1993, Pittaway and Edwards, 2012).

However, such progressive conceptions of what constitutes effective education have had substantial difficulties reaching a wider adoption in educational practice, both within and outside my field (Neergaard et al., 2012, Labaree, 2005, Mwasalwiba, 2010). There is a considerable gap between preferred and applied pedagogy, often due to the higher cost of active approaches and their misalignment to the conventional educational systems and paradigms (Mwasalwiba, 2010, Ardalan, 2008). The prevailing paradigm in most educational institutions rather emphasizes standardized tests, individual work, and detached theorizing (Jeffrey and Woods, 1998).

I see great promise in further integrating my field with more progressive pedagogical thinking such as expansive learning (Engeström, 2009) and its foundation in cultural-historical

activity theory (Vygotsky, 1978). If students "only" gain personal experiences but fail to build up general understandings of how key phenomena in my fieldwork then they might be successful in a specific applied context but are not guaranteed an ability to be competent in other types of situations.

Finding a balance between traditional (sometimes called "top down") and progressive ("bottom up") learning, I would argue is not enough. Rather, a main ambition of mine has been to develop ways to integrate between these two learning principles. Although yet to be researched more systematically, I am today convinced that the students in the way they systematically reflect upon their interaction with different environment gain considerable more knowledge than more traditional students having to rely only on literature or on a restricted amount of data/context etc. By demanding the students to "relate back" into established theories and categories, they actually not only add insider action-research insights, they also anchor their unique experiences into a more translatable and thus general understanding. In other words, having to translate to others the transformative process that the students are experiencing is both a process of legitimization of action and a critical means for reflection anchoring experiences into more general understandings.

Description of my efforts to develop as a teacher and visions of the future

Example 1

I think that the students in direct conversations have provided the most decisive input in my professional development as a teacher during the courses. I should also mention my daily contacts and discussions with fellow mathematicians. My development as a teacher is, and has been, an on-going process. I find it hard to pinpoint any decisive factors in this, apart from my willingness to listen to students and colleagues and, of course, my exposure to the actual teaching situation and reflection on the results. Nevertheless, I'll try to indicate how I've taken some things aboard after having studied pedagogical texts, but I want to emphasize that this is something that has happened over an extended period in time; it has taken time for the influences to mature and merge with my practical experiences.

• I try to make the students feel comfortable asking non-intelligent questions and to think that intelligence is a malleable rather than a fixed entity. I do this because I think that aptitude and willingness to take risks are important components when it comes to struggle with challenging tasks.

• In lecturing I tend to pay increasing attention to what is taught, why it's taught, and to explain what competence or mastery of competences look like. I do this to try to encourage meta-cognitive strategies and to provide a knowledge-centred environment that facilitates further learning and doing with understanding.

• I've come to see formative assessment as an increasingly important instrument in teaching. It makes students' thinking visible to both the students and me. It permits me to get a grasp of students' preconceptions and understand where the students are in the developmental corridor from informal to formal thinking, and to design instructions accordingly.

References

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Detailed description of two or three courses showing my pedagogical competence

Example 1

This was a course for 3rd year X Engineering students with the objective to give the students' basic knowledge of X, in particular applications with connection to, or which can be suitably used on, computers. For this course I decided to focus on continuous assessment. The teaching was quite traditional, lectures plus tutorials, but the examination was by means of weekly home works. The students were allowed to collaborate freely but had to hand in their own written solutions. There was an individual oral 'control' exam at the end. The strategy I adopted was to give lectures at a high level and fast pace, and give challenging home works which the students could get indirect help with at the tutorials. The solutions of these problems required for the most part independent argument/proof on behalf of the students, rather than just applying a formula, hence the grading was not a routine matter. My plan was to provide the students with a general framework of tools during the lectures, and then challenge their understanding of the subject with the problems. I gathered the tutors weekly to discuss what kind of support we should offer the students during the tutorials. Based on these discussions I revised my forthcoming sets of problems, to adapt them better to the kind of help we agreed to provide.

The course was evaluated using the standard web based protocol used at X University, the result of which was then discussed with a university official and a randomly selected group of five students. Student evaluations, course description, course memos, lesson plans, examination tasks are all enclosed in attachment X.

Example 2

I and three other teachers developed the course X. The general objective of the course is to give an overview of X. A special emphasis is put on the basic physical principles of the measurements, where the aim is to give a detailed knowledge. An understanding on a system level shall also be acquired. The course has about 15 students and includes lectures, two laboratory exercises and one MATLAB exercise with reports. The examination is a written exam. I give lectures about X and one laboratory exercise of about 4 hours, which includes writing a report. My part corresponds to 25-30% of the course. According to course questionnaires the students are in general satisfied with the course, see appendix and Table X. Of course there are issues to be worked on and improved, based on the comments by students, as mentioned briefly in section on future teaching.

A general pedagogical obstacle in this course is to take into account the students different level of knowledge. The course is rather broad and the students are from varying background and disciplines, such as physicists, electrical engineers, geoscientists and chemists both on the MSc and PhD level. My (our) approach is to try to sense these differences from discussions during the lectures, something that is possible since the course is small (10-17) students. I then try to adapt to these differences and provide extra help and background to the ones needing it.

A second obstacle is to create a common structure around the course avoiding overlap due to the fact that we are three lecturers. Primarily going through each other's lecture notes and having a kick-off meeting where we discuss these issues avoid this. We also have a common introductory lecture.

The student appreciation of the course has been evaluated through course questionnaires (attached). I have also attached course-meeting protocols from 2012 and 2010 with student course representative and teachers. The summary from the 2012 protocol was the following:

"The course was very well appreciated. The course covers a broad field. 11 students answered the questionnaire that corresponds to 68% of the students. The students claimed to have worked 15-20 hours per week. Most students have attended 75-100 % of the teaching. The overall impression was good, with an average score of 3.9". It is however difficult to assess the Pedagogic skills of the individual teachers since, unfortunately, this was not asked in the Questionnaire. My feeling is that the students appreciate the laboratory exercise although some student wants to have more laboratory instructions.

Example 3

To describe my efforts to develop and renew my teaching in concrete terms, I will write about the way I changed my teaching in Course X the second time I gave it.

The follow-up assessment of the course showed a high degree of student satisfaction with the course on an overall level. There was, however, some disturbing thing that could not be neglected. One was the sheer amount of manpower required: 5 tutors had to grade 30 sets of non-trivial homework problems every week. The oral exam of each student individually took two weeks during which I did absolutely nothing else, and still I only had 15 minutes for each student. From the students' point of view there were also problems. One was the amount of time they put into the course in relation to the number of points it gave in their program. A second problem, which only became known via the anonymity of course evaluations, was that some students were upset about how the format allowed some of their classmates to get a 'free ride'. Some students were contributing a lot more than others to solving the home works. Of course, the oral exam was meant to catch this, but in practice it didn't, because a 15-minute exam cannot test whether a student has contributed to what may have been many hours of problem-solving work.

The criticism I took on board when giving the course again in 2011, was that the serious students, as well as the teaching staff, were putting in too much work, while other students were getting a free ride. I preserved the basic set up of the course, but reduced the number of home works from 5 to 3, and replaced the oral exam by a written one, counting for 2/3 of the final grade. In addition, I changed the outline of the lectures from just providing a general framework, to also include some 'standard' material, which was examinable. This year the student evaluations contained some of the best comments I have ever read from students. Student evaluations, course description, course memos, lesson plans, examination tasks are all enclosed in attachment X.

In general, I try to keep an open eye and ear during courses, to get a feeling for how the students perceive the teaching and curriculum. Specifically, I usually appear in the lecture room well before it's time to start, to have a chat with early students. On these occasions we don't just talk about the course on which I'm about to lecture, but quite often also about the general workload and problems arising in parallel courses. I like to do this because I find that it build confidence with at least some of the students. Confidence in the teacher is of course an important aspect when it comes to attracting and keeping the students' attention, but to me it's equally important in making the students apt to disclose their opinions on the course while it's going on.

Description of my work as a supervisor

Example 1

When it comes to supervision of master's students my experience is limited to two completed cases. On both occasions I questioned colleagues, who knew the students from their teaching, as well as investigated grading reports, to get a good picture of the quality and level of ambition of the students. I also took a good look at the written rules at the universities

concerning the thesis projects, and made sure that both the students and I were aware of the details. The two students I've supervised had rather different ambitions and qualities. For the ambitious student we agreed on a problem were I was not 100 % certain about the result; i.e. I could not foresee a detailed path in the work to a final result, but I was sure something could be done. To me this is the ideal state of affairs for this kind of project. The work will then contain some degree of uncertainty and thus reflect the general situation in doing research, and hopefully also the joy of overcoming difficulties. For this thesis the idea turned out great. As predicted, unexpected situations appeared, some of which the student solved herself and others where my knowledge was challenged.
For the less ambitious student I proceeded differently. Here we agreed on a problem for the thesis, of which I was certain of the solution. This time the challenge for me was to get the student to feel the joy of independent success, while I knew the solution all along. Actually I think this project was harder for me than the first one; I spent a lot of time thinking about how to coach in a good way, without just giving the correct answer to the problems that showed up. I partly solved this by pointing to appropriate references in the literature, a job that the first student did all by herself. When this was not quite sufficient I studied the references with the student, and indicated why a certain result would resolve a difficulty in the work.

Example 2

Supervision is a difficult process. In my opinion it is about creating effective learning and research situations. In case of supervision of research students, I like to take an active part in the research. The start of the PhD-studies is crucial and it is very important to create a supportive environment and to strengthen self-confidence. In the beginning of the process I have taken a large portion of the responsibility for the progresses of work, formulating the problems, choosing theoretical framework and methodology and been very active in the report writing process. I believe that ideal supervision is that the PhD-student and the supervisor work together in a candidate master relationship for first the two to four years and during that time write two to three articles together. Then transfer responsibility to the student and change to more traditional supervision (someone to bounce ideas with and proof reader). The PhD student should be the single author of the last article. The most important outcome of the supervision is qualified engineers and researcher that can carry out qualified work in industry as well as in academia.

Supervision of Master theses can be even more difficult since the variation of projects is large. Their aim is to serve as a learning experience that integrates the disciplinary knowledge that the student has learned over the course of the education with the professional skills needed to make use of the knowledge in practice. One challenging aspect is that the problem might not be precisely in my field of expertise. Another challenging aspect of master theses projects is due to that most of master theses are carried out in industry. This is essential as it enables the student to apply his/her knowledge on a "real" problem, strengthening learning and motivation. However, it also limit my ability of influence the process and goals of the project. For industrial master theses project I, normally met the students every second week to follow up and discuss the project. In the end, the main concern is proof reading of the report and sometimes prepare the students for the presentation.

5. Production of study materials

Example 1

In the basic courses I produce lecture notes that I publish on the course home page. The notes are generally much appreciated in course evaluations. I also put a lot of efforts in producing course materials, assignments, exams and quizzes, se attached materials in Appendices. The following compendia are written by me together with co-authors: ….

Example 2

I taught a one-month master's course on X while on an exchange at University X. I wrote my own comprehensive lecture notes for this course, which are on my homepage. These notes follow the customary formula for this kind of material. Students at this level are quite knowledgeable and accustomed to reading standard advanced texts. The pedagogical twist one can exhibit is basically the choice of material, the order in which it is presented and the choice of examples. If something is specific in my style of writing, it's probably my wish to present things as if I'm telling a story, sometimes suppressing details when ideas are first presented, and then return to the finer points a little bit later on in the text.

I've written lecture notes for an introductory course for science students, who are not going to be exposed to any further training in my field in their education. In producing the text I had to take into consideration that the students were not particularly interested in my subject per se, and not fluent in computations even of a simple character. I solved this by carefully choosing examples and subject content with a distinctly applied flavour and still presenting the subject in a rigorous way. The exercises keep the skills to a minimum, focusing instead on a lot of images, from which the students are supposed to draw conclusions. I only gave this course once, but the material has survived and is still in use for this course.

6. Management in the field of education

Example 1

In addition to the administration involved in the course work I am chairman for the teaching staff of the department (faculty) since 2010. On the faculty meetings we discuss various aspects of teaching. Recently we decided to have more frequent meetings with a specific focus. Topics that have been covered so far are evaluation procedures, research supervision, research courses and pedagogics. The meetings aims to harmonise the teachers views on the above issues, minimise duplication of courses and laboratory exercises as well as giving tips for improvement. The agenda of the meetings is determined jointly, however, I have a central role as chairman.

Example 2

Taking on the role of co-creator a new school of X has been central in my work since 1996. This leadership has over the years also included substantial amount of administrative and managerially oriented work, necessary to make not only the school more sustainable but also to contribute to developments at the University and beyond. In short, I would highlight the following administrative and pedagogical leadership:

1. Co-creator to the X research school and research program (see Attachment X for reference)
2. Leading a multi-disciplinary research group (see Attachments X)
3. Starting, developing and financing X (see Attachments X)
4. Involvement in regional development processes (see Attachment X). This work is necessary to create an attractive innovative and entrepreneurial environment.
5. Being a university manager in different capacities: vice-dean, program director, and head of division (see CV).

8. Pedagogical activities and knowledge sharing outside the university world

Example 1

Since the start of X in 1997, I have met with and presented for multiple groups visiting our school. At least 50 visits in total from every corner of the world have come to visit us and learn more about our developments (see CV). The perhaps most distinguished visit was the current Swedish Prime Minister visiting 2005. The value of such meetings, where others come to us, is substantial. You learn about developments in their environments and from the discussions and questions asked. I have also partaken in the following study visits as providing valuable pedagogic learning: …

Example 2

I have presented the pedagogical innovations and developments at several international and national conferences/workshops, e.g., see list below: …

9. Other pedagogical qualifications

Example 1

I am a member and active in several educational networks. I attend and present educational innovations at international conferences. Through CDIO, I have a worldwide network. I have organized one international workshop on education. I am active in the Swedish X educations and organized the meeting for X engineering educations in June 2008.

10. Appendices

Example 1

Attachment 1 Verification of teaching and judgment of performance during my time as a Ph.D. student at Unversity X.
Attachment 2 Course evaluation, course name, spring 2009, University X.
Attachment 3 Verification and judgment of performance in the course X for teacher students, Fall 2009.
Attachment 4 Course evaluation, course name, Fall 2009.
Attachment 5 Verification of teaching in a Ph.D. course on X, Fall 2010.

Chalmers University of Technology
Faculty Appointment Committee
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