Teaching sabbatical-
5 months at UC Berkeley

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Fig.1 Sather Tower (the Campanile)

This text represents the final report regarding my stay as a visiting professor at UC Berkeley during the fall semester 2014; a stay funded by the STINT program Teaching Sabbatical. The outline of the text follows the instructions provided by STINT.

Preparation and planning

The notification letter from STINT was received in mid December, 2013, and the information meeting were held in early February, 2014. This set up, of having an early meeting, where new STINT fellows can meet previous dittos, is very useful, as it allows the former to get a lot of valuable advices.

The contact persons at the Global Engagement Office and at the staff of the host department (Dept. of Mechanical Engineering) at UC Berkeley have during spring, 2014, given indispensable help regarding practical details such as affiliation letters, VISA-related issues etc.

A couple of points that need to be clearly stressed, for future STINT fellows going to UC Berkeley, are

- there is a major difference being a visiting scholar and visiting professor, as e.g. the latter are not eligible for the apartments handled by the university
- the fellows will most likely need to find an apartment by themselves on the private market, via sites like Home Away (www.homeaway.com). However, the available objects (furnished, for a specific time period, and reasonably close to campus) are not that many and are generally very expensive!

It was clearly communicated by STINT that the mandatory planning trip was not to be done too late during spring- and this cannot be stressed strong enough! If going too late, the scholar will have less time to do the necessary preparation for the teaching to be done during the sabbatical stay, and more importantly, she/he will have a much smaller number of apartment objects to choose among. According to my colleagues, not only scholars look for them, but also students, who rent them together.

Regarding school for children, it is to be noted, that a number of "proofs of residency" (such as utility bills) generally have to be shown to the school district. However, as a visiting scholar/visiting professor these requirements are much milder (even though the local school might say something else). Furthermore, please also note that a full immunization record must be shown to the school district, including vaccination for chicken pox (or a proof that the child has had the disease). A remarkable fact is that it may not be possible to get such an immunization certificate in English via the Swedish tax-funded health care system- which however is possible on the private healthcare market!

Regarding the planning for the coming teaching activities, it was recommended by STINT and by previous STINT fellows (at the information meeting in early February 2014) to take part in co-teaching activities, which clearly give a deeper insight into how courses typically are run at the host department, and which give natural contact surfaces with colleagues involved in teaching. However, it is to be stressed that co-teaching is not always an option, and that the fellow in those cases will be giving her/his own course, with all the pros and cons associated with that. An important thing to consider in that latter case, i.e. when setting up "your own course", is the course prerequisites, as a BSc-program in the same discipline may look very different in the US compared to in Sweden, and as graduate courses may involve students with very different educational background (such as MEng and MSc students in their first years, and PhD students close to their exam). Other important factors to consider in the early planning of the course is grading (if grades are to be given, or just pass/not pass), and how to plan for midterm exam, quizzes, final exam, mandatory activities etc.

Finally, as a last issue under this heading, the STINT fellow should carefully check when she/he is allowed to enter the US and when she/he must leave (after the "grace period") w.r.t. the time period specified on the VISA. As a visiting professor you will probably get a VISA for the semester (from its start to its end), while a visiting scholar may have other dates.

Tasks and responsibilities

As co-teaching in an existing course was not an alternative/option for me, it has been my great privilege to be able to plan and carry out a course of interest to the host department at UC Berkeley. More specifically, I have given a graduate course entitled "Deformation and life modelling in high temperature mechanics-gas turbine aspects". The topic was based on identifying a common interest among both the host and home institution, and the outline of the course was decided/set based on discussions with my faculty contact at the department.

The course was run as a seminar course over the whole fall semester with pass/not pass as final grade, and the examination was done by a large mandatory report, a programming task, and a final presentation under conference like conditions (abstract, presentation, and active discussions).

I would here like to take the opportunity to express the great pleasure it has been for me to meet and get to know all the interested, ambitious and skillful students following the course.

Activities during the semester

During my stay at the Dept. of Mechanical Engineering I have

- with my colleagues discussed the way they plan/set up their programs and courses at the host department
- visited seminars and lectures held by my colleagues
- with my colleagues discussed forms and issues regarding examination, e.g. quizzes which are generally not found in Sweden
- visited exams and presentations
- visited research presentations/seminars
- with my colleagues, as well as other representatives of UC Berkeley, discussed how they train/teach their students in oral and written presentation, where I personally think the latter is one of the most important topics in higher education in Engineering today!
- visited the student workshop at the Etchewerry Hall, where a lot of very successful and interesting activities are taking place (see a separate section below). I personally think that a basic hands on experience is crucial for our young future mechanical engineers, as they today do not get this as naturally as before (e.g. due to more computer activities)

Even though the Teaching Sabbatical program is not mainly directed towards research activities, I have during my stay

- with my colleagues discussed their research activities, and identified common research interests
- visited research labs at the department
- planned and submitted a research proposal together with a colleague at the Dept. of Mechanical Engineering
- discussed research work with PhD-students active within my field of expertise

Finally, I have declared my interest in taking part in faculty meetings and other similar events within the department, but have unfortunately not got any such invitation.

Important lessons, or, better, the main outcome

The main outcome of a sabbatical leave is of course that you will be able to better see your own university, department, programs, courses and students in the light of what is going on in a high ranked university, and to use the gained experience and knowledge for improvements.

Comparison between the foreign and the home institutions

I have here chosen to highlight some specific topics, where it is to be noted that my comments mainly are based upon my experiences from the Dept. of Management and Engineering at LiU and the Dept. of Mechanical Engineering at UC Berkeley.

- My impression is that most aspects of the university activities at UC Berkeley are subjected to more assessments and evaluations then at my home university. The most obvious such context is of course the ladder ranks for assistant professors (on tenure track), associate professors and full professors.
- According to a representative of UC Berkeley, pedagogical and teaching merits are of course always important, but become even more so the "further up you are"- to me, this is a very nice thing!
- The research and education are, to my impression, closely related at my host department, with e.g. a common track (one application) for BSc and PhD studies (even though it also can be done in two separate steps). This leads, according to me, to a situation where the PhD-student (after her/his) master degree, to a greater extent still is seen as a student, and not as a colleague (as in Sweden). This is further accentuated by the structure of the PhD-track, with "prelims", master and "quals", and less focus (than in Sweden) on the final defense of the dissertation.
- A major difference between my host and home departments, is of course the "fika" and to some extent "lunch" cultures, which were not found at my host department- of course time consuming, but do provide natural contact surfaces and are in a way "group/team building/strengthening".

Action plan

It should be clear for the future scholars that duties like being the main supervisor, the head of the Division, or similar, will partly fall on you, even if you are on a sabbatical leave, meaning that your free/spare time at your new location will have to be used for such things!

I have (so far) not got any new roles (on any level) at my home university, but will of course try to make use of my gained knowledge as the head of the Division of Solid Mechanics. Furthermore, by discussing topics and issues related to education with my colleagues (members of different groups focusing on pedagogical questions and educational programs), I will hopefully also be able contribute in that way.

Topics which I find very important, and which I would like to continue to work with, are

- the ability of engineering students to produce written technical reports of high quality (good language), as this has become so important today- not only for the students themselves and for their future employers, but also for the university in terms of evaluation based state funding
- the ability of students in Mechanical Engineering to handle basic mechanical tools and mechanical workshop equipment, and the relevant integration of such activities in courses, or the offering of such activities in other student contexts
- the question of finding the appropriate usage of commercial software in engineering education.

Student machine shop activities

After discussions with my colleagues at the Student machine shop at Etcheverry Hall, it can be concluded that manufacturing activities are seen as a natural and important part of the education; and that this integration have been done in a very successful way. More precisely, during the last decade, the size of the facility has increased, the “classical” machine park (lathes, milling machines etc) has been renewed and extended, and new modern manufacturing equipment (like 3D-printers) added. The staff is in the order of 6-7 very qualified experts, which take care of the students’ basic training, support the students in their work, carry out advanced machine work for the students projects and plan for the future development of the work shop.

My colleagues specifically mention three courses in which large machine shop activities can be found. The first one is a third year (junior) course in mechatronics, where typically some kind of device is built, tested and evaluated. As this generally is the first course in which the students come in contact with the work shop, they will get a 5 hours introductory training including a general overview of the workshop, and instructions and practical training in how to handle basic work shop equipment as well as a lathes and milling machines- all with safety as the main issue. After this, the students will be able to handle the basic tasks related to their course work. If more advanced/difficult manufacturing steps would be needed, the staff is, as mentioned above, available as a resource. The other two courses mentioned regard machine elements and control, resp.

The available space in the workshop is used in a very effective way, such that many milling machines, lathes (c.f. Fig. 2 below), heavy duty drilling machines, saws etc are made available to the students. In addition to this, a number of CNC-machines, a water cutting device and other types more advanced equipment can be found in the workshop, which are used by the staff or by interested students (under supervision). It was mentioned that during the renewal of the machine park, new lathes of identical type and with the same digital equipment, were replacing the old ones, thus facilitating the education/training as well as enhancing the work flow in the shop, as the students are not restricted to one specific machine.

Fig. 2, Lathes in the student machine shop

As mentioned previously, in addition to the classical machine shop equipment, also modern manufacturing processes are available to the students, such as 3D-printing, see Fig. 3 below.

Fig. 2, 3D-printers (in the background)

I was also told that the workshop at Etcheverry Hall will soon also be equipped with a modern laser scanner (made available by a donation). Thus, by a combination of classical and modern production/manufacturing equipment, the faculty and staff have the possibility to set up courses in which simulation based design may be combined with actual manufacturing, testing and evaluation- the last issue not least important for the students learning- why did the final product behave as it did, and what could we possible have done differently?

I am very glad to see that the pendulum has swung back in such a positive and promising way at UC Berkeley, as it is so important for the engineering students in their future careers, as well as for the reputation of the university who educates them, that they have a basic understanding and experience of basic tool and machine handling. As the students are less and less likely to have that experience when they come to the university, it is of crucial importance that it can be provided in their education. Furthermore, to see that it also can be incorporated in such a good way as at UC Berkeley is really impressive and encouraging. Actually, I was told by the staff at the student machine shop that a basic experience of this type is seen (not surprisingly- my comment) in very positive terms by American companies when it comes to summer internships or actual jobs!

Practical details for future scholars

Even if the information material from UC Berkeley is very good, and contains a lot (most) of the practical information needed for a visitor, I have nevertheless given some comments below, which the future fellows might have some use of.

Driving license

According to the information provided by UC Berkeley, the State of California does not recognize any international driving licenses. Furthermore, when checking with different authorities and actors such as DMV (the Department of Motor Vehicles), AAA, BPD (Berkeley Police Department) and UCPD (University of California Police Department) which type of driving license you need (Swedish, International or (temporary) Californian), no clear picture emerges, and it often comes down to that "it's up to the officer who pulls you over".

Insurance for rentals/tenants

According to a representative of a major insurance company in the US, the tenants in Berkeley are very well protected by the law, independently of what it says on the contract which the landlady/landlord requires to be signed. However, you may get an extra insurance for a very cheap price!

Bank business

One possibility to handle bank affairs is to go to any major US bank company, and set up an account. However, our experience is that using Swedish debit or credit cards works very well. However, the former are also to be "used as credit cards" as the debet code won't work (the same seems also to be true for debet cards from other states in the US).

Transportation in Berkeley

The public transportation in Berkeley works very well, and as we were lucky to get a very good housing close to downtown and campus, no car was needed in the daily life. By the BART (Bay Area Rapid Transit), one can very conveniently travel in the Bay Area, including both the SFO and the Oakland airports. When going to/from an airport with a lot of luggage an airport shuttle is the preferred choice, as it often is far less expensive than an ordinary cab. When using public transportation it is recommended to get a so called "Clipper card", on which you easily add value, and which can be used on BART, local busses and the SF MUNI (San Francisco Municipal Transportation).

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