

Report: Teaching sabbatical Amherst College, Dept. of Biology, Fall 2015

Joachim Sturve

Application

I first learnt about the STINT teaching sabbatical program when the director of studies at our department, Prof. Kristina Sundell, emailed information to the staff about the program and encouraged us to apply. After a lot of consideration I decided to apply since I want to improve and expand my teaching. I consider myself to primarily be a biologist and researcher but teaching takes a big part of my time and I have worked part-time as a lecturer for over ten years. I enjoy teaching, especially due to the contact with the students, and I felt it was time to expand on my pedagogical skills. And I realized that this program would give me more experience and new influences compared to pedagogical courses offered at my home University.

The main problem with the application process was to choose host College and after screening the Colleges/Universities homepages I selected a few that I found interesting.

Preparations and planning

In April 2015 I travelled to Amherst College for a visiting and planning trip. The week in Amherst was very well organized and my contact Janet Tobin had made sure that my visit was well prepared. A plan for the week was scheduled with visits to all essential people, from course leaders and staff to personnel at schools for my children.

Prior to my visit, I had been in contact with my academic contact Prof. Michael Hood that was extremely helpful. We had several Skype meetings and made a plan for my staying and activities. Initially we discussed the possibility for me to bring my course in Ecotoxicology to Amherst and give it as a part of the Colleges course supply. However, I expressed the wish to co-teach and participate in several courses given at the campus. I was given that advice at the STINT meeting in February by previous STINT fellows and I also felt that that would give me a greater insight in the Colleges courses and pedagogic and I would learn more.

Besides the academic part I also had the opportunity to arrange practicalities for my family. To find housing is difficult in Amherst but I was lucky in finding a nice house in a good neighborhood in the middle of Amherst. I also arranged with schools for my children, the

Wildwood elementary school for Astrid, 9 years, and Amherst middle school for Joar, 12 years. Our oldest daughter Emilia, 15 y, did not go to school in Amherst; she did her schooling through Sofia distans school in Stockholm, Sweden. Since she was on her last year of elementary school and had to apply to high school we decided on homebased teaching to secure Swedish grades facilitating her application to high school.

Due to the well-organized visit, arranged by Amherst college staff, I managed to organize with all practicalities for my family and to get a good overview of my teaching for the fall during the visit. This made the move to Amherst later in the year quite easy.

Amherst and Mount Holyoke Colleges

Both Amherst and Mount Holyoke (MHC) Colleges are liberal arts colleges founded in the early 1800's. The Colleges are similar when it comes to the amount of students and faculty and the ratio staff to students. However there are some differences, MHC is an all-female College and Amherst College is considered to have a higher national ranking and better economy. Both colleges are part of the five college consortium in the area and therefore it was possible for me to also get involved in courses at MHC. The five college consortium is a nonprofit educational consortium established in 1965 with the aim to promote broad educational and cultural benefits for its members. The consortium includes four private liberal arts colleges, Amherst College, Mount Holyoke College, Smith College and Hampshire College, and the Amherst campus of the state university (UMass).

Courses in which I was teaching

Since I decided to focus my teaching sabbatical on co-teaching I had the opportunity to participate in several course at different levels during the fall. I spent most time on the course in Animal Behavior at Amherst and Oceans Blue at Mount Holyoke due to the practical laboratory parts I led in those courses. In the other three courses I was mainly lecturing. The courses are described shortly here.

Amherst College

Animal Behavior (Biology 280/281), course leader Dr. Ethan Clotfelter: The course focused on animal behavior from both a mechanistic and a functional perspective. Based upon examples

from a diverse range of taxa, the course treats topics such as sensory ecology, behavioral genetics, behavioral endocrinology, behavioral ecology and sociobiology. My part in the course was to give lectures and supervise one of the laboratory parts. The lectures treated how foreign compounds, such as pharmaceuticals and pesticides, can affect animal behavior. The laboratory part was quite extensive and we studied how the pesticide imidacloprid and the pharmaceutical fluoxetine can affect different behaviors in two fish species, the zebrafish and the fathead minnow.

Seminar in Biogeochemistry (GEOL 450), course leader Dr. Anna Martini: In this seminar, the students examine tracers and proxies for microbial activity present in rock, sediment, soil and porewater. Environments studied include hydrothermal vents, deep sedimentary basins, early Earth and possible extraterrestrial habitats. The course focus on the major biologically relevant elements of the periodic table (C, O, S, N, Fe, P) and examine how these elements cycle through the environment, focusing on stable isotopic tracers of biological processes. The course put great emphasis on field and laboratory techniques and current scientific literature in discussions. My part of the course was to give lectures and lead a discussion based on research literature. My lectures treated nanoparticles in the environment and nanoparticle toxicity. However, I misunderstood the course and the background of the students and my choice of literature was not good a led to a discussion seminar that wasn't optimal. This was my biggest and only failure during the fall but also gave me some new insights.

Biodiversity and Ecology of Marine Environments (GEOL107), course leader Dr. Martin Medina-Elizalde: This course is a first cycle base course in marine biology. The main focus of the course is to examine the ecology, function and adaptations of organisms that support diverse marine environments from nearshore to offshore and from shallow to deep water. The course also treated how human activities are altering the marine environment, including the large-scale impacts of the Exxon Valdez and Deepwater Horizon oil spills, and this was my contribution to the course. I gave lectures in marine ecotoxicology focusing on oil spills and the problems with plastics in the oceans.

Mount Holyoke College:

Oceans blue (Biology 326-01), course leader Prof Renae Brodie: The course is an advanced literature course and based entirely on published research related to marine conservation and the

aim is to introduce students to the latest research in the ocean sciences and to current urgent concerns about global change and the environment. The focus was on primary literature and student-centered discussions improving the student's abilities to read, analyze and discuss research literature. The course explored several topics, including anthropogenic impacts on marine communities, ecotoxicology and marine geology. Each week the students had presentations and debated hot topics in marine conservation. One of the more interesting parts of the course was the student debates that were held at several occasions. My part in the course was to contribute with lectures, a practical laboratory part and to lead student projects in the end of the course.

Poisons: Death by Chemistry: A seminar course that deals with toxic chemicals, with a human focus, and their toxic mechanisms. As in the other courses I contributed with an ecotoxicological perspective focusing on the effects of endocrine disrupting chemicals and their effects in the ecosystem but also in humans. This course was not included in the initial plan for my co-teaching but the course leader, Dr. Alan Van Giessen, was my neighbor in Amherst and he asked if I could give some guest lectures which I did.

My teaching

My teaching was focused on two parts, lectures and practical laboratory projects. Regarding the lectures my contribution to all of the courses was within my area of expertise, ecotoxicology, and was a good complement to the curriculums. Since my part was quite open I took the opportunity to develop new lectures and expand my teaching portfolio. A relative new area for me, both for research and teaching, is related to animal behavior and how it can be affected by foreign compounds. So I developed new lectures and tested them in different courses. The lectures were appreciated and will be good additions to my courses in my home department. The practical parts were bigger challenges since I had to organize all the parts myself and make sure that everything I needed was in place. I had practical parts in two courses described above. In the animal behavior course the students analyzed fish behavior and how it was affected by pharmaceuticals and pesticides. A lot of work was focused on setting up of aquaria systems, including finding necessary equipment in a new environment, and exposing and maintaining fish. This laboratory part was also new for me and something I had to design from the beginning.

However, this part was quite successful, great fun and will be a valuable contribution to future courses in my home department.

In the course Oceans blue at MHC I had two practical parts. The first was a laboratory that illustrates biochemical effects of pesticide exposure. It is a practical apart developed and used for years in my home department and there was no need for further development. Fresh water mussels were exposed to the pesticide malthione and biochemical effects (biomarkers) were studied. The main challenge for this part was to organize the practicalities and find equipment and chemicals. The course leader is an ecologist and had limited facilities for biochemical analyses measuring enzymatic activities, so I had to involve other laboratories which sometimes can be difficult and sensitive. However, it was very successful and the students got very nice results clearly showing how aquatic organisms can be affected by pesticides. The second part was based on student independent projects and I supervised two of them, both involving effects of foreign compounds on crayfish. One group focused on the pesticide imidacloprid while the other focused on the pharmaceutical fluoxetine (active substance in prozac). It was a long time study in the end of the course and the students had to design and implement the study themselves under supervision. Both groups were organized and hardworking and got relevant results. The projects were new for me as well and once again, great contribution to my ordinary teaching activities in Sweden.

Other course related activities

Besides teaching at different courses I also took the opportunity to participate in other courses as an observer. One course of particular interest was the introductory course Molecules, Genes and Cells (Biol191) that give an introduction to the molecular and cellular processes common to life with an emphasis on control of energy and information flow. Central themes of the course include metabolism, macromolecular function, and the genetic basis of cellular function. The course is based on lecture but have a big part devoted to team based learning (TBL) which interested me. TBL is a good strategy for student involvement and I participated in several sessions to learn successful strategies for TBL. The idea is to let students in groups working as teams contribute with different parts of a problem to get a complete answer to a specific question in the end. To make a TBL session successful it is most important to formulate good questions/assignments that can engage the students and let them work as a team and contribute

with parts of the puzzle. One very nice example was when the students got the assignment to draw a mitochondria and a chloroplast on a white board and include all biochemical process important for their function, off course without course literature or other help. Prior to the TBL session the topic was treated during normal lectures earlier in the week. After one hour all groups had drawn nice mitochondria and chloroplast including all biochemical processes they were supposed to know, and this with very little help.

Comparison between host and home institution

I have since many years extensive research collaborations with several colleagues in many countries, and I'm fully aware of similarities and differences in culture and how problems are solved. However, my experience in the field of pedagogy was quite limited since I hadn't participated in any teaching abroad, besides PhD courses and guest lectures that are quite international. I had therefore difficulties in knowing what to expect and tried to keep an open mind. One thing I was curious about was how the college students compared with my students back home. It was quite clear that both colleges are "elite" schools with well-motivated students with strong academic background. The main difference, as I see it, is that there is a stronger selection of students in these colleges leading to more motivated students, while the Swedish system doesn't have the same selection. The motivated students I have in Sweden are on the same level as the students I met in Amherst, but in Sweden I also have less motivated students in the same course leading to a lower average. The homogeneity of students makes it easier to teach and to keep an appropriate level on the lectures. However, I soon realized that the college students are much more grade oriented focusing most off their efforts on parts of the course that secured good grades, leading to a bit more narrow-minded approach to studies.

Center for community engagement (CCE)

One of the practical problems I encountered was the lack of office space at the department of Biology. The facilities were very nice but the only place available for an extra office was in a laboratory, which would have served. However, as an alternative I was offered office space in the center for community engagement (CCE) which turned out to be a great solution. The CCE is located in the Keefe building is located in the middle of campus. The Keefe building serves as a Hub for students and contains several student support offices such as; Office of Student Life,

Multicultural Resource Center, Women and Gender Center and the Schwemm's Coffeehouse.

There were constant activities and exhibitions in the building leading to a great flow of students giving me the opportunity to chat with students from all over the College.

The CCE is an office that provides faculty and students with the opportunities to collaborate with the society outside the College. The aim is to facilitate collaboration and to engage the society in meaningful ways that may enrich an innovative liberal arts education. The staff at CCE was extremely helpful and made sure to keep me in the loop regarding activities that could interest me.

One of the more interesting occasions (not initiated by CCE) was the siting of students of color in the library in the middle of the term. The siting was a form of strike and a support action against racist attacks that occurred in other Colleges during the fall. It became quite clear that there were several cases of racism also at Amherst College even if the region is supposed to be more liberal. Several students gave testimony of difficult situations and structures. It seems as if racism, even if more subtle, is present also at Amherst College. However, as far as I understood it, the siting led to constructive discussions between the students and the faculty led by president Bidy Martin, and it will be very interesting to see how this issue develops.

Overall the placement at CCE was positive giving me the opportunity to see more of the College and related activities. However, on the down side, it made the daily contact with the staff at the Biology department more difficult.

Future perspectives

The main benefit of this teaching sabbatical was the privilege to spend an entire semester focusing on teaching and reflecting over pedagogy and how to improve and expand on my own teaching. Even if I'm not a trained teacher, but a biologist and researcher, teaching is a large part of my daily activities, as it is for most researchers at Swedish Universities. I strongly believe that the main teaching load at Universities should be carried by active researchers and scientist and not staff working only as teachers/lecturers. However, the teaching has to keep a good level and lecturers need the possibility to reflect and expand on their teaching, and get further education if necessary.

The experiences I got and the lessons I learned during my teaching sabbatical in Amherst are valuable and will definitely lead to an improvement of my future pedagogical work. During the fall I had the opportunity to develop new lectures and practical laboratory parts, which I already

have used in courses in Sweden. Besides these direct effects there are many influences I would like to apply in my courses in Sweden.

Grading is always difficult and I saw several benefits with a more fragmented grading, meaning that one course is divided in several well defined parts that were graded separately leading to a final grade. Many courses in Sweden are graded on one large final exam making the students too focused on that, often putting in too little work in the beginning of the course and a large effort in the end.

Team based learning seems to be an excellent complement to a course and I can see several ways to implement the TBL strategies in my ongoing courses. Even though I knew about the strategy before it was valuable to participate in a well-structured course and see it working in real life. In addition, I got good contacts with the teachers at the course and they offered support whenever I decide to implement the strategy in my courses.

Another pedagogical strategy I experienced and will implement in my own teaching is debates, which I experienced in the Oceans blue course. Even though we frequently use debates or discussions in our teaching we do not structure them as well. Here the debates were very structured with a specific topic, and the teams had to be for or against. And the timing was very strict with well-defined time for both teams to put forward their arguments, followed by time for critique, followed by time for reorganizing, followed by final arguments. The well-structured form forced the students to be very clear and focused on what they wanted to say and how to respond to their opponents. I believe that this is important for selecting and valuing background literature and to think through a specific topic. And this will help students to put knowledge in a context and perspective.

Future Collaborations

During my staying in Amherst I met several interesting researchers and a lot of possible collaboration opportunities presented themselves. A concrete and ongoing collaboration is with Prof Renae Brodie at MHC. One of the students final research projects in the Ocean blue course led to very significant and important findings and is now in the process of being published as a research paper. We also have other projects going on at the moment and we are planning to continue collaboration focusing on the important field of animal behavior and ecotoxicology. Also with Prof Ethan Clotfelter, course leader of the Animal Behavior course at Amherst

College, there are possibilities to continue collaboration. Besides direct effects and contacts the staying in Amherst gave me a bigger understanding of the situation for researchers in general in the USA, making it easier to start collaborations with researchers on the other side of the Atlantic.

Acknowledgement

I would like to thank STINT for this amazing opportunity, both for me and for my family. I'm confident that this program is leading to clear improvements of the pedagogical level at Swedish Universities. I know for sure that it has given me a lot of new experiences and inputs. I would also like to thank Janet Tobin and Prof Michael Hood, my contacts at Amherst College, for all the help I got and for their effort to make my staying successful. I would also like to thank everyone I collaborated with, both at Amherst and MHC, as co-teacher. Last but not least I would like to thank Prof Kristina Sundell at the department of Biology and Environmental Sciences that showed me this opportunity and helped me during the application process.