

# STINT Teaching Sabbatical 2016 – Final Report

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Host institution: Nanyang Technological University  
(NTU), Singapore



UPPSALA  
UNIVERSITET



**NANYANG**  
**TECHNOLOGICAL**  
**UNIVERSITY**

## Preparation and planning

After being awarded the STINT Teaching Sabbatical scholarship, I was contacted by Mr. Eric Tey, Manager at the Office for International Affairs at Nanyang Technology University (NTU). Mr Tey was my main contact person for the handling the practical and administrative aspects of my sabbatical stay at NTU. My academic contact was Assoc Prof Shunuke Chiba of the Division of Chemistry and Biological Chemistry (CBC), where I had been assigned. Initial contact was via email, with the main objective of organising my one-week planning trip to Singapore in April 2016. The associate head of teaching, Assoc Prof Bingang Xing was also informed of my upcoming visit and sabbatical stay at the Division, and dates for the planning trip was arrived at by mutual agreement, with flights and accommodation being arranged by me from Sweden.

As I did not have any accompanying person for my sabbatical, the logistics of the trip was fairly straightforward. The three main issues to be dealt with during the planning trips were: (1) application for the Employment Pass (EP, i.e. work visa) at the Ministry of Manpower, (2) accommodation and (3) discussions about my teaching duties during my sabbatical stay. Although none of these details were discussed in advance prior to my arrival for the planning trip, Mr Tey was very helpful in organising right the evening of my arrival in organising the meetings and paperwork that was necessary to arrange these aspects.

For the application of the EP, it was necessary to book an interview in person at the Ministry, which Mr Tey arranged. He also accompanied me to the interview to field questions and fill in details that were necessary to ensure that the EP could be issued. I subsequently received a letter from the Ministry that I could present at the border upon my arrival in late July for the actual sabbatical. The actual EP (in the form of an identity card) was issued after my arrival and received by post.

Accommodation was arranged on campus through the NTU Housing Office, again with Mr Tey as my contact person. While the Housing Office seemed reluctant to issue any guarantee that I would be assigned a staff apartment prior to my planning trip, this proved to be unproblematic in the end. During the planning trip, a visit was arranged to see an apartment similar to what I would be offered during my stay. Initially an apartment much larger than what I required was shown, but on my request I was able to be assigned to a more suitable and smaller apartment (with a lower rent). Utility bills were to be additional to the rent for the apartment, and the Housing Office initially offered a choice between a flat rate of \$150 per month, or the actual cost based on meter-readings (with a final bill containing an estimate be paid in advance for my final month). After discussions with Mr Tey about the cost of utilities, I opted for the actual cost options, which proved to be more economical as my monthly bill was only around \$50, no doubt due to the fact that I was a single occupant.

Meeting with the academic staff in the Division of chemistry was arranged. Apart from meeting A/Prof Chiba and Xing about the general arrangements of my stay, I was also introduced to the colleagues who normally taught the course which I would co-teach during my time at NTU. I was assigned the compulsory third-year course CM3041 Physical and Biophysical Chemistry 2, and would take over from A/Prof Edwin Yeow the section of the course (50%) dealing with spectroscopy, and co-teach it with Ass/Prof Zhi Heng Loh, who would teach the section on quantum mechanics. I had in fact taught a very similar course for a period of about 6 years at Uppsala University (UU), and I would be able to take this opportunity to revise and update the course content. We met to discuss the format of the course, the background of the students, their experiences of teaching this course and what I could expect. While I

was to co-teach this course with Ass/Prof Loh, we would take our sections individually rather than jointly.

Apart from arranging the practical details for starting to teach at NTU, Mr Tey was extremely helpful in showing me around the NTU campus, the shopping districts closest to campus as well as other areas of Singapore. This gave me a very good introduction to Singapore and orientation for me to explore the island further upon my arrival for the sabbatical.

### Tasks and responsibilities

My position at the CBC was as a “STINT fellow”. As I was not receiving a salary from NTU, I could not be registered in the system as formal staff or visiting professor. This did in fact cause a number of administrative obstacles, as I fell between categories in the NTU system and had problems with e.g. access to online databases of professional development information and courses, obtaining a library card, being included in staff email lists where teaching and seminar information was being sent etc. According to Mr Tey it was also a struggle to organise an “@ntu.edu.sg” email for me, which was important for being able to access internal communication channels.

The only formal tasks and responsibilities that I had during my sabbatical was co-teaching the course CM3041. This was a purely lecture course without any laboratories or tutorials, with a total enrolment of 169 students. I was responsible for delivering the lectures, writing and marking the midterm and final exams, and being available for consultations during the course. Other than these formal requirements, it was very much up to me how I wanted to go about performing these duties. As mentioned above, while I was co-teaching the course, the two sections of the course were very separate and there was little direct need for collaborative work with Ass/Loh except when compiling exams, organising the logistics of marking exam papers and reporting the results. A couple of other formal tasks associated with the teaching responsibilities was the moderating of the final exam paper for two other courses at CBC, where we were to check and assess the suitability and degree of difficulty of the exam papers against a standard rubric, and also the final CBC Board of Examiners meeting to discuss and moderate the final exam results for the course.

### Activities during the semester

#### *Teaching CM3041*

A substantial part of my time at NTU was spend preparing and delivering the course CM3041, with my part of the course taking place during the second half of the semester. Although I had previously given an essentially identical course at UU, I needed to translate the material. I also wanted to take the opportunity to revise and update the course content, adjust it to suit the needs of the local student population, and the teaching schedule for the course. In particular, I wanted to revise my lectures having regard to the current literature on chemistry didactics to try to help students enhance their conceptual understanding and scientific reasoning. Particular attention was paid to aspects such as linking the multiple levels of representations in chemistry (macro, submicro, symbolic, according to the Johnstone’s triangle model), inductive reasoning based on data and observations, scaffolding the material being taught with explicit linkages to what the students had been taught in earlier courses at NTU, and discussions of the nature of scientific models, how they are used, and how to construct scientifically sound argumentation.

The instructional technology infrastructure at NTU was far superior to what is currently available at UU, with an abundance of active learning classrooms, and interactive whiteboards/projectors and student response systems (“clickers”) being installed as standard (see further details below). I therefore took the opportunity to incorporate the use of learning technology in my course delivery as much as I could and where I felt it would be appropriate to enhance student learning. In addition to introducing clickers questions during the lectures and using the interactive whiteboard facilities, I also conducted my consultation sessions in active learning classrooms rather than in my office, as was the usual practice at NTU. Furthermore, I strongly encouraged students to use the discussion forum function on the learning management system (LMS) Blackboard for asking questions.

In addition to these aspects, continuous revisions to both my teaching strategies and materials in order to adapt to the local student population and study culture (see below for comparisons between UU and NTU with regard to these aspects). These are addressed further below. Adding the significant time required to draft and mark the midterm and final exams, the delivery of the course took up most of my time during the second half of my stay.

#### *Visiting active learning classroom and laboratory facilities at NTU and NIE*

There has been major investments into building and refitting tutorial rooms allow for increased student activity and group work, supported by technology such as interactive whiteboards and multiple display screens for displaying student group work. Such active learning classrooms were found across the campus at NTU and at the National Institute of Education (NIE), which was an autonomous organisation within NTU with the sole responsibility in Singapore for teacher education. I took the opportunity to explore these facilities and test how they could be used.

The most iconic building housing active learning classrooms (ALC) was The Hive, a building dedicated to such teaching spaces. These classrooms were also now standard for tutorials rooms across the campus, and different configurations were found at different sites. A very impressive initiative was the new faculty of medicine where the pedagogy of the entire degree program is centred on team-based learning (TBL). As such, no traditional lecture rooms were to be found as traditional lectures were not used as a teaching format. Instead, ALC's of various sizes were built instead, with the largest capable of accommodating over 240 students. This was the first time I had seen an example of such a large ALC, and it was clear that their dedicated team of support staff to ensure the smooth running of TBL classes in such large groups was an essential part of implementing this teaching method.

As part of my visits to these ALC's, I also sat in on a number of classes to observe how teachers used the space and technology in their teaching.



The Hive and an example one of the many ALC's housed in this building.



An ALC at the NIE.



The largest ALS at the Lee Kong Chian School of Medicine, capable of accommodating 240 + students.

### *Discussions and mentoring*

I attempted engage in discussions about teaching and pedagogy with members of staff. This took place most frequently with two assistant professors at the department. One of these was a very dedicated teacher who was a pioneer in using TBL in teaching a first-year general chemistry course for students in an elite scholarship program. We frequently discussed aspects of teaching at NTU, the implementation of the TBL format, as well as his work on using student blogs as a tool for both student learning and assessment. I observed one of his classes, and also attended together with him a TBL class at the medical school to see how TBL could be applied in their large scale ALC.

There were also many discussions concerning teaching with another assistant professor who was very keen on improving her teaching. I offered to act as her teaching mentor for one of her lectures, which she accepted. As I have also done at UU as a teaching mentor, this involved discussions before her lecture, observing her lecture, and another discussion after her lecture to provide feedback. On top of this, we also engaged in discussions throughout the semester.

As much as I attempted to engage in pedagogical discussion with colleagues as much as possible, this was not always easy as there was no obvious space such as lunchroom or tearoom where staff members would informally gather. As such, spontaneous encounters and discussions were rare and it was not always easy to find colleagues to discuss with. In any case, I did make contact with other teachers and attended a couple more classes. All these discussion, observations and encounters gave very interesting insights into teaching practices and the educational culture at NTU.

In addition to meeting colleagues at NTU, I also managed to arrange to meet a professor in chemistry education at the NIE towards the end of my sabbatical. We had some very interesting discussions and exchange of experiences about our respective teacher education programs. Given the severe shortage

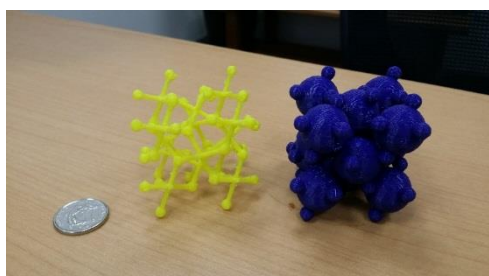
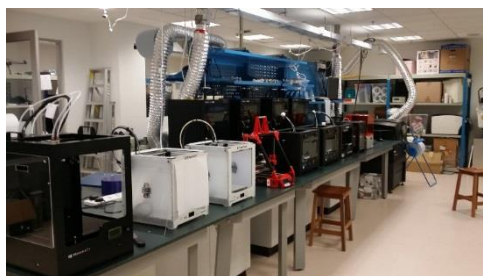
of secondary chemistry teachers in Sweden, it was fascinating to see the differences in professional status, recruitment systems and content in the teacher training programs in Singapore and Sweden. The fact that there were many researchers specifically in discipline-based didactics in the various school subjects teaching didactics at the NIE seemed to be a particularly strong point in their teaching education program. It was also interesting to see that, despite the NIE being an autonomous unit within NTU, there was little contact or exchange between the two institutions.

### *Exploring 3D-printing*

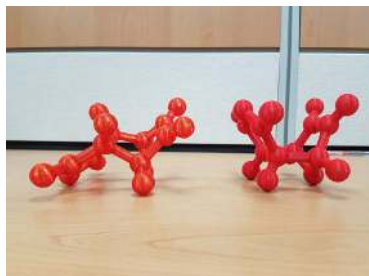
There was a 3D-printing lab at the School of Physical and Mathematical Science (SPMS) which was available for both students (especially those attending the course Making and Tinkering) and academics. A variety of different makes and models of 3D printers with different capabilities could be found in this lab, and a technician was employed full time to help those using the facilities. With the kind permission of the senior lecture in physics in charge of this lab, I was able to try out designing models for 3D printing and consider how they could be used as teaching aids. Along the way I gained many insights into the possibilities and limitations of using 3D printing for teaching purposes.



3D-printing lab at the SPMS.



Examples of 3D-printed molecular models



### *Use of blogs as a teaching tool*

As mentioned above, an assistant professor at the department was one of the forerunners in the use of blogs as a tool for teaching and assessment. Students work in groups to produce blog pages according to a template in order to explain concepts in chemistry both from a theoretical and technical perspective, but also for popular science communication through both the written word and other media such as short videos. Students learn therefore both the subject content, but also communication skills.

As a result of my discussions with this assistant professor and seeing his students' work, I became interested in exploring this further. As the WordPress user and developer conference WorkCamp happened to be held in Singapore during my stay, I attended this conference, which gave me insight into a user community that I did not previously know about. I also met two members of NTU Library's

blog team (Blogs@NTU) that provide support to all teachers and students using blogs at NTU. Two members of this Blogs@NTU gave me an excellent personal introduction on how to create blogs, as well as the different variations of the WordPress platform that were available, including those geared towards use in education.

As a result of this, I tried creating a blog for myself ([www.felix1477.edublogs.org](http://www.felix1477.edublogs.org)) to gather together various photos from my sabbatical stay. While this blog has not been updated extensively due to a lack of time (and limited storage space for the free version), it gave me an great hands-on experience and ideas that could one day lead to their use in the classroom in Sweden.

### *Second language acquisition and chemistry didactics*

One of my interests in chemistry education and chemistry didactics is the issue of the use of representations in teaching chemistry, specifically how they can help or hinder students from understanding chemical concepts. One aspect that has been discussed in the literature is that chemistry has a particular “language” of its own, and particular ways that are accepted for communicating and discussing chemistry. This “chemical language” is significantly different from everyday language, and an inability to understand or use it can lead to significant barriers for students learning chemistry.

As I am also very interested in learning foreign languages in my spare time, I became interested in considering whether the literature concerning second language acquisition (SLA) and second language instruction may have insights to offer that could also be applicable to chemistry education. As part of this, I found the undergraduate course Second Language Acquisition that was run by Ass/Prof Luca Onnis and he kindly allowed me to sit in one his class.

Apart from being introduced to various concepts and literature in SLA, I also had the opportunity to participate in a class that was run at The Hive in one of the ALC's, and experience first-hand how the classroom dynamics and methods of instruction is influenced by such a classroom. Furthermore, Ass/Prof Onnis also used student blogs as part of his teaching and examination, in the form of the production of WikiChapters produced by students that were edited, updated and expanded by students taking the course in successive years. An interesting sequence for improving students' writing and argumentation skills was used, where students first critiqued the chapters from previous years and discussing areas of improvement, before they themselves worked on editing and expanding chapters themselves.

As the focus of the course moved on in its latter parts to aspects very specific to language learning (use of corpus databases, phonology etc), it became less relevant for my thoughts concerning applications in chemistry education. At this time I stopped attending the classes, but it was nevertheless a valuable experience in learning the basics in this field of research, and observe another teacher's teaching practice.

### *Conferences*

I was able to attend a number of conferences during my time in Singapore:

- International Conference on Chemistry Education, Kuching, Malaysia.
  - This was a conference I was already planning to attend, but my much closer geographical location made attendance much easier. I presented two oral presentation and was also able to attend the annual meeting of the IUPAC Committee

on Chemistry Education (for which I have since become the National Representative for Sweden).

- WordCamp Singapore, 2016.
  - As mentioned above, this was a user and developer conference for the WordPress blog platform.
- Innovations in Teaching Seminar 2016
  - An internal conference for teaching staff at NTU. It was a good way to meet some other teachers at other faculties at NTU.

## Comparisons between the host and home institutions

### *Student population*

The most obvious difference between UU and NTU regarding the student population was the much higher number of chemistry students at NTU. The yearly intake into their chemistry program is around 240 students (which does not include the chemical engineering program, which is taught by another department). By contrast, around 25 chemistry students start each year UU (with a further 60 in the chemical engineering program, which is also taught by the Section of Chemistry at UU). Aside from the practical aspects with much large classes at NTU (169 students in CM3041 compared to usually around 20 students in the corresponding second-year course that I had previously taught at UU), there seemed also to be larger spread in the background knowledge and interest in chemistry for the students at NTU compared with UU. A number of colleagues recounted that the chemistry program is not one of the more attractive programs at NTU, with chemical engineering being seen as more prestigious and preferred. According to the local staff, the main focus for a significant number of students is to obtain a university degree, with the choice of chemistry as a subject being secondary, which is seen to affect the extent to which these students' motivation and interest in learning chemical concepts well as opposed to strategically getting through the program as expediently as possible.

Since I only taught one half of a course, it is difficult to confirm such claims or otherwise, especially since I only had personal contact with a small number of students in the class. Apart from the challenges of having personal contact in a large enrolment class, the lecture attendance rate was also quite low. All the lectures at SPMS are by default recorded and uploaded online, so students could watch (and re-watch) lectures at any time. This no doubt affected the lecture attendance rates, especially given the early starts of the lecture for CM3041. The Wednesday lecture that started at 8:30 am was attended by around 25 – 30 students, whereas the 9:30 am lecture on Mondays had somewhat better attendance, at around 80 – 90 students. Nevertheless, it was clear (during the final examination invigilation) that there were many students who never physically attended any lectures or came to office consultation hours. Compared to my experience at UU, with much smaller student numbers and higher lecture class attendance rates, I was usually able to have more direct contact with the students.

### *The relation between teacher and student*

As is typical at all educational institutions in Asia, teachers are accorded a large degree of respect by the student (and other non-academic staff). Students mainly address their teachers as "Prof [surname]", but with teachers with whom they feel more comfortable they could also be addressed by their first name, but always preceded by "Prof". Generally students also defer to what the teacher says and are slow to question or point out possible mistakes. It can be difficult to gain enough trust among the students for them to ask questions publically in a lecture, and even more seldom that they would openly point out mistakes that a teacher may have made (though happily this did happen once!). Once



they felt comfortable and confident enough with the teacher, however, they may approach them during breaks or after class to ask questions. It was however clear that this was very dependent on to what extent they felt the teacher was approachable.

This is in significant contrast to the situation at UU, where students are much more likely to ask questions during lectures or other classes, and interrupt a teacher if they suspect that a mistake has been made. In implementing student-active teaching methods, it is generally easier for students at UU to join in in ways that require open participation, whereas NTU students seemed more comfortable with methods that were more anonymous or discrete (e.g. answering anonymous clicker questions). The Swedish academic culture is clearly much less hierarchical and authoritarian than what is the norm in Singapore. At UU there is more negotiation between teachers and students about e.g. what is an acceptable workload, the quality of teaching, difficulty and levels of expectation on student achievement etc, whereas at NTU the students seemed to be more or less bound to accept what is given to them. While they clearly also have opinions about these aspects, discuss this amongst themselves, and have a degree of influence through course evaluations, these are nevertheless more a culture of acceptance than at UU.

A comment I often heard from colleagues was that NTU students were “passive” or “lazy”. This was however not the impression that I got for the majority of students who attended my classes. While it is undoubtedly true that the students were much quieter and not likely to openly ask or respond to questions in class, it was also clear that they were very attentive and actively thinking about the material that was being discussed. From a formative evaluation (carried out via anonymous post-in notes) and the final course evaluation, it could also be seen that the students appreciated the various opportunities to be active during the lectures (e.g. via clickers, being asked questions), even though they also recognised that they were often quiet otherwise. Naturally there were also students who were less attentive, but this was not, in my opinion, more that I have encountered at UU.

#### *Status of teaching merits vs. research merits*

From discussions with a large number of teachers, both at the CBC and also other departments, it was clear that research merits is prioritised much higher than teaching merits at NTU, with respect to tenure, promotion, salary and annual bonuses. Every year all academic staff undergo an annual appraisal, where their achievements during the past years are evaluated against the key performance indicators (KPI's) that were set for them the previous year. There are four areas of KPI: research, teaching, outreach (interpreted in the sense of student recruitment) and service to the department (sitting in different committees etc). Although all these areas are considered to be important, without exception the opinions of the academics with whom I discussed this with intimated that research was the most important. One must publish enough papers in the right journals, and be speakers at the right conferences. With regards to teaching, the key instrument for assessment is the course evaluations that are filled in by students, and according to the staff I have spoken to, teachers are expected to achieve an average score of 4.0 (on a scale of 1 – 5) to be regarded to have performed satisfactorily. However, according to those I discussed this issue with, while it is essential that one meets the minimal expectations for teaching performance, they generally view that meeting this expectation is enough, since they perceive that excelling in teaching does not otherwise give extra merit in considering the teacher's performance. In particular, there is a perception that excellence in teaching cannot compensate an average or below average performance in research, whereas if one excels at research, then shortcomings in teaching performance could more readily be overlooked. Clearly, these are impressions amongst the academic staff whom I have talked to, and does not necessarily reflect official

policy or practice, but it is nevertheless apparently a widespread conception amongst the teaching staff.

There are complicated and sometimes contradictory conceptions amongst different strata of the organisation of what teaching merit entails. Speaking to those involved in evaluating teacher merits for staff applying for tenure and promotion, they were firm in their opinion that when writing their evaluation reports to the promotion committees that they do not simply look at the teaching scores alone, but also take into account the qualitative responses of the students, and whether the teacher had made attempts to innovate and implement new pedagogies in their teaching. There is a recognition that such efforts can at least in the initial stages negatively affect a teacher's teaching score, since there is often a period of refinement and adaptation required, for both the teachers and the students. This is also communicated to the teaching staff at various pedagogical courses and seminars. However, as far as the teaching staff with whom I have discussed are concerned, they are overwhelmingly sceptical that this takes place in practice, or at least the extent to which promotion and tenure committees take such adjustments into account. As such, there is a widespread concern amongst the teaching staff about their teaching evaluation scores, as meeting the 4.0 average is regarded as so important for appraisals and performances. However, this also seemed to lead to a reluctance, at least amongst some members of staff, to make changes or test methods that may lead to lower student satisfaction. The much higher esteem in which research performance is perceived to be held compared to teaching performance also leads to strategic choices being made on what to prioritise given available time and resources.

Comparing this to the situation at UU, it does not seem so different that research excellence is significantly more highly regarded in general compared to teaching performance. While this perception seems to be changing, and teaching excellence is clearly promoted more and given wider recognition (e.g. the Excellent Teacher title in recognition for teaching excellence that is on-par with the Docent title for research, various internal funding opportunities for teaching development), it is nevertheless an undeniable conclusion that the primary criterion for advancement and success in academia at UU and Sweden is research output. With university departments' ever increasing reliance on external funding, research output is crucial for many academic's survival in the system. Criteria for academic appointments and promotion do stipulate pedagogical skills as a requirement, but it is generally still research output that is the primary factor. The major difference between UU and NTU is the system of annual appraisals and KPI's, where staff are additionally ranked in their performances against each other. This difference is a reflection the different philosophies for evaluation and quality assurance between Singapore and Sweden, where Singapore adopts a much more metrics-based, relative ranking approach (like much of south-east Asia), with numerical assessments and the normal distribution being the norm. By comparison, such systems are now much less commonplace in Sweden (a comparison can also be drawn to the abolition of relative grading system in schools and universities in Sweden, whereas such systems are standard in Singapore and much of south-east Asia).

#### *Professional development of teachers*

At NTU there is a central Teaching, Learning and Pedagogy Division that is responsible for teachers' professional development, and offer a range of courses and seminars throughout the year. The topics covered range of course design, student active teaching methodologies, TBL, assessment, instructional technologies etc. These courses and seminars are open to all teachers for their professional development, and all newly recruited teaching staff attend a three-day introductory course on teaching in higher education. They also arrange the internal conferences addressing issues of teaching and pedagogical development, such as the annual Innovation in Teaching Seminar. There is also a

Centre for Research and Development in Learning (CRADLE) consisting of teachers from across different departments of the university that aims to support research into student learning in higher education. At UU, there are also similar organisations such as the central Academic Teaching and Learning Unit under the Division of Quality Enhancement, as well as faculty-based organisations such as the Council for University Pedagogical Development (TUR) at the Faculty of Science and Engineering, and the parallel organisation PRÅM at the Faculty of Medicine and Pharmacy. Furthermore, the Centre of Discipline-based Education Research in STEM (MINT) at the Faculty of Science and Engineering also support research efforts into higher education teaching and student learning.

As such, similar organisations exist at both NTU and UU for professional development of teachers. During my short sabbatical stay at NTU, it was difficult to get a sense of the extent to which teachers actively participate in the activities of these organisations in order to make a comparison with UU. Nevertheless, opportunities exist at both institutions.

#### *Infrastructure, use of technology and organisational structure*

One of the most striking things about NTU is the fantastic infrastructure that it has, for both research and teaching. Being a young and rapidly expanding university, the buildings and facilities are generally very new and construction continues. It is evident that economic resources is not a problem at NTU, and staff and students enjoy excellent infrastructure.

In the domain of teaching facilities, the great infrastructure with respect to the active learning classrooms, interactive whiteboards and campus-wide clickers system were already mentioned above. The dedicated support teams were another brilliant feature at NTU. By comparison, Uppsala has a long way to go in terms of enjoying the same level of technical and support infrastructure. While there are now being discussed more and more for further building projects, and there are pilot projects in different campus areas, it will take time for these to become standard like they have at NTU. The Swedish financing model for universities, and the system of state-company owned real estate which universities have to rent from, seems to make such expansions much more complicated to achieve. Labour costs are also high in Sweden by comparison, which also makes it more challenging to hire dedicated teams of technical support staff, especially before these technologies can be shown to be well-adopted and that there is a high demand for such support. This creates a Catch-22 situation: without sufficient technical support, many teachers would be put off from testing and adopting new instructional technologies and teaching methods. But this means in turn that demand for technical support would remain low, thereby not sufficient to justify investing in support staff.

The existence of technology infrastructure and support is, however, no guarantee for adoption and use of the technologies. There needs to be other incentives for teachers to use such technology, which is something that poses clear challenges at NTU. During my time there, I observed a surprisingly low rate of usage of the instructional technologies, and this seems to be confirmed by comments in my course evaluation where students stated almost with surprise that they appreciated my actually using the technologies available. This is a domain where UU could potentially be more successful in, as there is, in my opinion, a rather comparatively more positive attitude towards teaching activities. There is also a more developed network of pedagogical support and training at both the university and faculty level. These strengths should be exploited more in future development work at UU.

Another big difference between NTU and UU is the overall organisational structure. As is common at Swedish universities, the management and leadership structure is largely built upon the idea of collegiate leadership, “primus inter pares”. By comparison, NTU is much more hierarchical and top-down in nature, which is also a reflection of Asian culture in general. This difference can be clearly felt

in the nature of directives, chains of command in decision-making processes, as well as the performance evaluations and ranking that all employees are subject to. Critical discussions amongst staff members are common at UU and wide consultations during decision-making processes are indeed expected as standard. The situation is very different at NTU, where decisions are made and implemented according to the established hierarchy. Both of these systems have their advantages and disadvantages. While the collegiate model at UU ensures that a large number of people have the opportunity to have their say, decision-making processes can become extremely drawn out and can lead to a lot of inertia and frustration. Furthermore, it is in general not possible in any case to please everyone, and there is a risk of ending up with a compromise that no one is satisfied with. By contrast, decision can be made and executed at a much faster pace, which leads to a more dynamic environment, where strategic decision can be acted upon quickly and potentially take advantage of prevailing favourable conditions. The downside is though that the experiences and opinions of those lower down in the hierarchy are not always taken into account, despite the fact that they are often the ones who have to implement and are most affected by the decisions. This can have a negative impact on the working climate and employee motivation. The continuous evaluation and ranking processes also seem to create an elevated amount of stress amongst the staff.

## Lessons, personal reflections and the future

The observations above have provided much food for thought about the role of a university, the role of a university academic, different styles of leadership and organisation structures, and different ways of implementing change and improvement. In hindsight, many of the insights I have gained have been unexpected, and not necessarily only through direct observation of different practices, but rather through the contrast that I noticed between the host and home institutions. Many have occurred to me on my return to UU and seeing the contrasts in the reverse direction.

Many of the lessons I take with me are already mentioned above, but there are some overarching themes, issues and questions that have emerge for me include:

- What are the roles, responsibilities and goals of a university? What main purposes should it try to fulfil, and what are the criteria to judge excellence and achievement? How should such evaluations be conducted in a meaningful way that leads to quality enhancement and not encourage instrumental “check-listing”? What should be the balance between quantitative and qualitative measures of success?
- There is a distinct need to provide specialised support to academics in their roles as teachers. There is an increasing demand on teachers to cover all bases in terms of teaching, administration and technical know-how, and this in many cases can raise the threshold too high for innovations.
- It is important to avoid disconnects between different levels of management, leadership and implementation of initiatives (e.g. top-down policy vs. grass-root level implementations; directives and requirements vs. (dis)incentives for effective implementation; stated aims and goals vs. pre-conditions for implementation).
- It is vital that the reasons, justifications and motivations for initiatives be communicated clearly and convincingly to all affected levels in order to achieve meaningful and sustainable change.

- Agents of change can involve all levels of the organisation, from the university leadership and management, academics, support staff and students. A shared vision and belief in the goals and objectives are key elements of achieving meaningful quality enhancement.

My time at NTU has been valuable and enriching in many ways, some of which I had not expected before I participated in this Teaching Sabbatical program. Partly as a result of my stay at NTU, I have been given the task of working as a Coordinator for Instructional Technology at the Faculty of Science and Technology at UU to work on coordinating and starting initiatives for the use of instructional technology at the faculty. This is a multi-faceted role that includes identify needs and opportunities to improve and increase uptake of instructional technology in teaching at the faculty to improve student learning, supporting the creation of networks and support (infra)structures (both technical and pedagogical) to enhance the effective use of such technology. This work will also involve, together with stakeholders in the faculty and the university as a whole, formulating visions, strategies and infrastructure specifications for build upon existing efforts and foster new initiatives. This is a big and somewhat daunting task in addition to my current duties, but one which my time at NTU has given me many more tools and ideas to try to accomplish.

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