



## **STINT Teaching Sabbatical 2017**

### **Final Report**

**Oleg Popov, Umeå University**

#### **Preparation and planning**

In December 2016 I received a scholarship from STINT with placement at the National Institute of Education (NIE), which is a part of Nanyang Technological University (NTU) in Singapore. It was there that I spent my teaching sabbatical, August - December 2017, a truly wonderful experience. At NIE I had the opportunity to further develop knowledge concerning teacher education in Singapore, a country with high performance in international comparative science and mathematics studies (TIMSS and PISA). During my preparation for the sabbatical, I expected to participate actively in pedagogical and academic activities at the host institution. Amongst other things, I expected to perform peer-teaching, peer-observations and develop and teach courses during the period of the teaching sabbatical. I can say that my expectations were more than fulfilled.

During the spring of 2016 my department of science and mathematics education hosted a guest scholar from Singapore who came to spend his sabbatical with us at Umeå University. Throughout the course of his visit we had many opportunities to discuss different issues, including educational development in his country. As a

result of our discussions, I became aware that education is a national priority in Singapore. The government provides, through the Ministry of Education (MOE), generous funding for the schools. Further, MOE closely monitors school performance, i. e. how public and private schools follow the curriculum, and the quality of pedagogical activities. He also offered me a book by Lee Kuan Yew, the founding father of modern Singapore, titled: “From Third World to First: The Singapore Story - 1965-2000”, that I read before going to the planning visit in April, making me well aware about the context of the country.

The planning visit gave me and my family only positive experiences of the country and the workplace. NTU officials and the head of the department of Natural Sciences & Science Education (NSSE) were very welcoming. My office was already available in April 2017, with my name on the door. It was important to make this planning visit in order to get to know the people with whom I would be conducting active communication in preparation for the sabbatical. My academic host A/P Paul Lee was of great help every time I needed personal or professional advice.

Before I discuss my professional activities during the teaching sabbatical it is important to give a brief introduction of my work place.

### **National Institute of Education**

The National Institute of Education (NIE) is an autonomous institute of Nanyang Technological University (NTU) in Singapore. It has own administration and infrastructure such as internet network, teaching platform, library service, pool, gym, etc. I had only limited access to the services provided because I did not have formal affiliation to NIE, but services were functional enough for me to fulfill my duties at the department.

NIE staff not only conducts research in education but also “content research”, meaning pure science research. At the Department of Natural Sciences & Science Education a majority of publications are in the fields of pure physics, chemistry and biology. NIE’s plasma research group is world-leading in their area of specialization. Therefore, the number of publications and citations from NSSE is very high in comparison to the amount of publications done by similar Swedish departments.

Value-work and leadership training are central for all educational programs. Voluntary work is promoted for NIE students with regular advertisements on the

website and around campus. Staff are expected to be role-models for the students. “The best teacher is one who can inspire the heart of every student and through this, change their lives not only within the classroom but beyond” (Lee Sing Kong, former NIE Director). “My teachers role modelled sound values for us to follow and emulate” (Vivian Huan, Associate Dean, NIE).

NIE is probably the only teaching institute at NTU that does not have foreign students. Selection and admission of Singaporean students is done very carefully, based not only on the highest school examination grades but also on interviews. Thus students have high study abilities, are motivated, ambitious and professionally oriented.

Diversity is a major slogan at NIE. This includes diversity in research but also Cultural Diversity. NIE is active in international exchange programs. It also organizes regular study visits and developmental work actions in the region. In some programs students have to spend six months at foreign institutions.

**Application for Semester Exchange**  
 Closing date: 9 February 2018  
 Calling all student teachers from the BA/BSc (Ed) Programme!  
 The application for Semester Exchange is now OPEN!

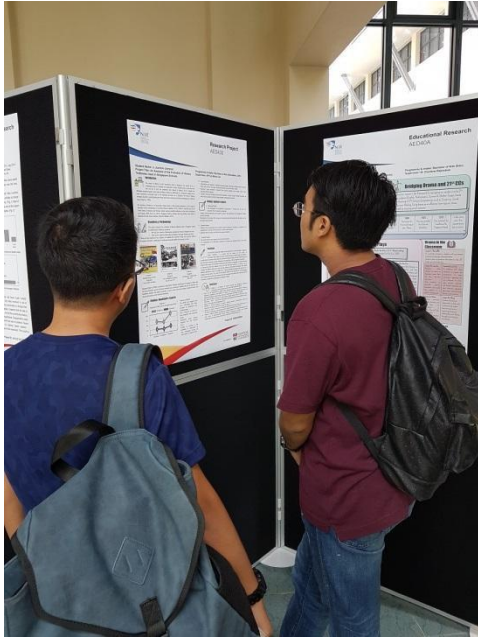
For enquires, please contact Mr Sunny Siteo / Ms Michelle Lim at 6790 3116 / 6790 3659 OR email to sunny.siteo@nie.edu.sg / michelle.lim@nie.edu.sg

Like us on Facebook  
<https://www.facebook.com/niebabs/>

University	Subject	Exchange period
Queen's University, Canada	All	Sept – Dec 2018
University of Stavanger, Norway	All	Sept – Dec 2018
University of Helsinki, Finland	All	Aug – Dec 2018
Pädagogische Hochschule Zürich, Switzerland	All	Sept – Dec 2018
Linköping University, Sweden	All	Sept – Dec 2018
Stockholm University, Sweden	Math and Science major only	Sept – Dec 2018
VIA University College, Denmark	All	Sept – Dec 2018
The Education University of Hong Kong, Hong Kong SAR	All	Sept – Dec 2018
National Taiwan Normal University, Taiwan ROC	Chinese major only	Sept – Dec 2018
University of Taipei, Taiwan ROC	Chinese major only	Sept – Dec 2018

### Call for exchange semester

Students at NIE study several courses (4-5 per term) in parallel. During the second year many of them start to do educational research (a project course lasting one year). This is an elective course but if a student does not choose this course, then it will become a compulsory educational research project during their third year.



Poster section of the 2<sup>nd</sup> – 3<sup>rd</sup> year students' research projects.

Further, the fourth year curriculum contains a compulsory “content research project” course. Science students have to choose physics, chemistry or other subjects to, under individual supervision, do their research in.

NIE also has some specific rules, for example a code of conduct and dress code for student teachers on campus. As stated in the code of conduct, NIE aims to develop student teachers into *cultured teachers*. “A cultured teacher is one who is smart looking, confident, caring, creative, and a mentor, learner and leader. As part of the desire to project a positive total image of teachers, a code of conduct and dress code for student teachers on campus has been established and student teachers are expected to observe the code.”

There is regular staff rotation between NIE and MOE. The Department of Natural Sciences & Science Education (NSSE) has 30+ staff members, among them six teachers (specialists) seconded by MOE to work at NIE for 3-4 years. After they finish their duties at NIE they return to MOE to work as curriculum specialists or master-teachers.

Finally, I would like to comment on a typical feature of NIE academic culture: the use of abbreviations in different documents and during the meetings. This professional context-bound jargon was often difficult for me to decode, particularly in the beginning of my teaching sabbatical.

## **Tasks and activities during the teaching sabbatical**

During my sabbatical I taught a physics course at NIE and was a part of the group of seven permanent staff members teaching physics. The permanent staff members all combined content research with some educational studies.

My course QSS50C had 21 students, most of them women representing all major ethnic groups in Singapore. They were studying to be primary school teachers. During the semester they had 14 modules of different length. The final course test of the course I was teaching took place on the 24th of November. The students were rather tired then but performed well as expected.

I made an open seminar for NIE staff about my research on the 11th of October. In general, NIE-staff are overloaded with a variety of seminars, open lectures and other professional development opportunities. It was also interesting for me to attend these when I had time. Often the activities provide free lunch, something uncommon at Umeå University.

Thus, I attended, to name a few, the following activities:

- NIE research in education introduction day on the 28th of August.
- ASEAN workshop on Frontiers of Physics 2017, in partnership with CERN, on the 30th of August.
- School science conference on the 16th of September.
- TEDx at NTU on the 7th of October.
- Biology Olympiad on the 18th of November.

I regularly observed classes in science and technology education for pre-service and in-service teachers and visited excellent laboratory facilities at NIE. Many productive discussions with colleagues took place in formal and informal arrangements at NIE premises and at restaurants in and around the campus.

Work in teacher education involves close contacts with schools and I visited several schools in Singapore. School visits for foreigners are not easy to arrange, but my colleagues at NIE were very helpful. I could join them for their research fieldwork in schools. I will report here slightly more extensively about the school system, as my activities in teacher education included gaining an understanding of the local school context.

As a visiting scholar for five months in the country, I got a clear understanding of the existing societal pressure on students to achieve high academic performance and to build up a fine CV, starting in the earlier school years. Students are expected

not only to have high grades in school, but also complement their educational merits with participation and awards at scientific conferences, competitions, voluntary work, leadership courses, to be in charge of club activities, etc. This imposes much stress on students and not least on their families for organizing and facilitating every kind of activity. I have heard comments from Singaporean educators that the main reason for the high academic performance of Singaporean students, and the high placement in different international measurements and competitions, is found in the societal mentality of extreme “study dedication”, borrowed from Chinese culture. In Chinese culture, education is seen as the way to assure future success in life. “There are no magic pedagogy but rather hard study”, commented one colleague.

Students’ performance is measured by a variety of examinations, making the students extremely focused on tests and exams. What do I need to know for exam? What is the right answer? Therefore, as a colleague explained, problems can arise when there is no single right answer, like in discussion of climate change issues. This could be a shock for some students. Not all of them ready to face reality where no right answers, but instead different possible solutions that all have pros and cons. Consequentially, students sometimes opt for more structured subjects and disciplines that provide more satisfaction for their “examination mentality”.

Secondary education is organized in streams (tracks): Special (specialized STEM, culture, or sport high schools, e.g. NUS-high), Express (Junior colleges) and Normal (academic and technical). Special and express track students are from earlier school years focused on theoretical studies and high academic performance. However, according to a colleague, most of Junior College graduates have good intellectual skills but sometimes lack social skills. Thus, students need to develop social and collaboration skills when they commence teacher education. Group work is not easy from the beginning for those who focus on individual performance, as they are trying to compete for leadership in their groups.



NUS-high school physics lesson

However, special and express tracks do not accommodate the majority of secondary school students. Most of the students are on normal “slow/low” tracks. Usually, for these students to enter a theoretical track it is necessary for them to attend private tuition centers and take extra exams.

In normal municipal/community secondary schools, student study motivation and support from home are rather weak. According to my guide in one such school, teachers are expected to “complement or even substitute parents” providing sound values and being “care-gives” in many ways. Schools are aiming to endorse the learners’ self-discipline, responsibility, respect for themselves, peers, teachers and elderly people. Value-work is considered a very important part of the curriculum. In general, community schools are more like Swedish schools in their approach to education, but in Singapore discipline and collective activities are more strongly emphasized.

I would like to mention the Applied Learning Program (ALP) and the Learning for Life Program (LLP) courses: project-based studies that can give students the possibility to work on topics of their interest in schools. These activities are not formally graded which gives more space for relaxed study and creativity.



Applied Learning Program poster in a community school

During my stay in Singapore (2017) the government announced closure of 50 schools by the year 2019. This is a result of declining birth rates in the country and parents hunting for places in the best schools. Thus, the less privileged schools have to be closed or merged with more prestigious ones. This will lead to a lower demand for new teachers in Singapore and affect admission rates to some NIE programs.

### **Comparison between the NIE and my home institution in Sweden**

Diversity, flexibility and fine tuning of education according to the demands of MOE are typical features of curriculum work at NIE. However, the examination system is rather rigid. Even when a course has one or two students they have to do written exams. Oral examination is practically absent in science courses.

It was interesting for me to see two clear tracks available for carriers within the educational system: research, and professional pedagogical work. This corresponds to two academic degrees: PhD in education (research oriented) and Doctor of education (practice oriented research). We do not have this in Sweden.

The NIE campus has many posters and banderols propagating for official visions and innovative pedagogy. A language of “Cs” is broadly used: Critical thinking, Communication, Collaboration, Creativity (these are four twenty-first century skills), and further, Cooperation, Convocation, Confluence of ideas, Continuum, Confidence, Co-teaching, Compassion. We generally do not have such exposure to visuals at Swedish Universities. I do not know how effective these are at influencing the attitudes and worldviews of future teachers and staff.



Networking and connecting people is actively promoted by NIE's leadership. All departments have a policy of broad international recruitment, exchange and sabbatical programs. Staff have regular long term academic visits abroad (different forms of sabbatical) for research and writing activities. This is an important part of competence development for NIE teachers that has no equivalence in the Swedish teacher education institutions.

The admission of students into teacher education is a very selective process in Singapore. It can be compared to the admission to medical faculties in Sweden. When demographic situation in the country is changing, as it is now, with fewer children in schools, Singapore needs fewer teachers. As a result the selection procedure is becoming even tougher.

The balance between research and teaching is strict at NIE. Professors cannot freely disperse their time between teaching and research but must instead, even if they have funding for research, teach courses according to the needs of the department. Everybody should teach undergraduate and masters students. Masters courses are normally given on evenings, not an attractive time, but old professors and young lecturers will do their teaching duty in master courses. People often joke that "research is considered more like hobby for the staff – they find time anyway to do it, but teaching is a holy activity". Everybody takes teaching very seriously.

Some words need to be said about the relation between the teachers and the students at NIE which are very friendly. Every professor teaches in average 3-4 courses per term and supervises some student projects; therefore they get to know students quite well. I was surprised by the fraternity uniting teachers and students there.

The status of pedagogical merits is high at NIE. It is comparable, but not equal to, research merits. Teachers are expected to do a lot of curriculum work, develop new courses, new laboratory activities, ICT-solutions: apps, animations, etc. They participate as judges in science fairs and competitions. These activities are voluntary, but an important part of their pedagogical work. They also supervise school students' preparation for such competitions. Most of the courses are technology rich, in the sense that they use ICT and laboratory facilities.

MOE and NIE have a very close relationship, not least in defining the research priorities relevant for the Singaporean context. For example, MOE provides block funding, around 120 million Singaporean dollars, on a five years basis, for

educational research at NIE. Such a research link between Skolverket and teacher education in Sweden has just started to develop.

### **Action plan**

The use of technology in education, like receiving and giving “just-in-time” feedback from and to students. Using digital media such as videos for assignments proved to be very effective in the courses that I taught and attended at NIE. I will use these tools in my pedagogical work in Sweden and spread them to my colleagues.

This teaching experience in Singapore accentuated my interest in intercultural science education. I did a lot of reading and thinking regarding this. Intercultural science education is, as a topic, relevant for the Swedish education research and teacher training system. I plan to continue to work in this area more systematically now.

I have already made a presentation for my department, and invited colleagues from other institutions working with teacher education. I will join the alumni network of STINT fellows at Umeå University, and hope to be an active part of it.

I was invited to give a presentation at Södertörn University on topics related to my scholar experience at NIE. There are different issues possible to address comparing Singaporean and Swedish teacher education. For example, ways of spreading and sharing the results from the teacher students’ final research projects could be explored and problematized based on Singaporean experience. These issues will be in focus in my forthcoming conference presentations, research applications and educational development work.

### **Acknowledgements**

I would like to thank STINT for the scholarship and Umeå University for nominating me as a potential STINT candidate. I am also very grateful to my colleagues from NSSE and NIE with whom I collaborated and socialized during my five month long stay in Singapore for their hospitality and friendship.