

# ONE THOUSAND FLOWERS IN DELFT: A BOTTOM-UP APPROACH TO IMPROVE TEACHING INTERNATIONAL STUDENTS

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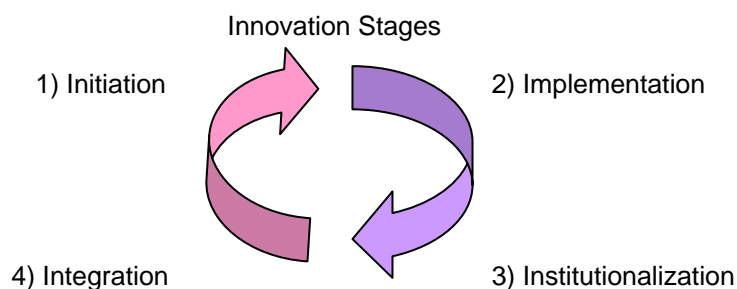
## Abstract

Delft University of Technology (DUT) is becoming more and more an international community. Since lectures on master level are all conducted in English, the numbers of students from foreign countries attending DUT are rising and international cooperation within educational projects is a necessity. To prepare educators for the continuing internationalization and globalization of education, a project named 'One Thousand Flowers in Delft' is launched at DUT. The key strength of this project is the bottom-up approach to internationalization. The Flowers project approach is a method to stimulate lecturers to turn the spotlights on internationalization in their own classrooms and to apply international skills, knowledge and attitudes in order to make these topics a more integrated part of the regular curriculum. This approach has proven itself over the years in ICT projects as an important motivational factor for lecturers, because it uses the challenges they themselves experience in class as a starting point. Instead of educational advisors prescribing lecturers what to improve on, lecturers come up with small-scale projects on topics they feel need improvement. The solutions participating lecturers find often turn out to be very valuable for a larger group of lecturers, since these solutions are rooted in and easily applicable to everyday education. In this paper, we will discuss the development and results of five Flowers and consider the possibilities the results have to offer other lecturers.

**Keywords** - International students, intercultural communication, multicultural group work

## 1 INTRODUCTION

As a rule, general processes of educational innovation follow three non-linear stages: initiation, implementation and institutionalization. Initiation is the stage in which the willingness to adopt a certain innovation is expressed. In the implementation stage the innovation is introduced, and in the institutionalization stage the activities become common practice (Fullan (1991) [1]. Van de Wende (1996) [2] in her study on "internationalization of higher education" mentions another stage that we might call integration (see fig. 1). In the integration stage, governments and institutions design strategies that integrate the international dimension into the mission, administrative hierarchies, curricula and budgets of the institution in question.



**Fig. 1: The four stages of educational innovation (Fullan, 1991, van de Wende 1996)**

This paper discusses an initiative of the Centre of Expertise on Education FOCUS to consolidate internationalization in the English-medium degree programs at Delft University of Technology by the "One Thousand Flowers in Delft" project [3].

The national educational board states [4] that many curricula know international aspects. We may, however, not always be aware of these international aspects. Therefore, it may be valuable to consider which elements curriculum or subject level is already dealing with internationalization and can be positively emphasized. Another question may be; in what way can a subject or curriculum be adapted to become more international.

Until recently, the internationalization at Delft University has for lecturers mostly been a top down issues. The institutionalization still remained limited to a relatively small number of lecturers, who have been involved in the creation of a joint degree or joint education programs. These lecturers usually have a large amount of experience with internationalization. However, the general lecturing populace, does not have an equal amount of experience and is struggling with changing learning environment. The main idea behind the Flowers project is to stimulate the initiative to internationalize the curriculum based on positive practical experiences, realized by lecturers in their instructional settings, such that they can adequately address the increase in international student number and the rapidly changing learning environment.

The central aim of the Flowers project is to help lecturers and students realize internationalization in education creates a positive experience and broadens the horizons of both lecturers and students. Derived from the central aim are four sub goals. The first is to realize an academic integration of local and international students/staff; i.e. more intercultural sensitive students/staff. Second, with the Flower project the initiators try to achieve a sustainable integration of an international dimension at subject of curriculum level. Third, dissemination of best practices is an important aim. Fourth, with this project the initiators hope to broaden horizons of both students and staff to better prepare them for a globalized world.

## **2 THE ONE THOUSAND FLOWERS PROJECT**

In order to encourage lecturers to pay attention to the intercultural awareness of their students within the regular classes, the One Thousand Flowers project was launched in November 2008. Participating lecturers develop and incorporate small-scale internationalization projects known as 'Flowers' in their teaching to enhance student skills in working in international environments with international groups. Lecturers are in the lead: based on their own assessment of the needs of their students, they decide how to integrate intercultural skills in their teaching. This grassroots approach has proven itself over the years in ICT projects as an important motivational factor for lecturers [5], because it uses the challenges lecturers themselves experience with international students in class as a starting point. The current 'One Thousand Flowers' project group consists of eight lecturers. The group of participating lecturers converges on a regular basis to assist one another with advice and receive educational support. The Flowers are supported financially through one time € 1000, - incentive which participants can spend on educational matters of their own choosing. This project started late 2008. At this point, most initiatives are still running and have not yet been evaluated. Results, discussed in this paper are therefore necessarily of a preliminary nature.

### **2.1 Flower themes**

The four central themes have been chosen to emphasize the central internationalization policies of Delft University of Technology as described by Spiekerman in 2005 [6].

The first theme fits the central policy of joint education with preferred partners, in which local students in cooperation with the partner institution jointly design a product or solve a problem. The projects are small and explorative in nature and maybe up scaled in the future.

The second theme supports the Internationalization at home policy, in which local students are prepared for the international environment at the university itself and acquire competencies for the international labor market. Another aspect of theme two is the desire of the University to be internationally oriented and to have an outward open attitude, using the available knowledge of the international student body and staff to prepare for an international society and working contexts.

The third theme supports the ambition of the DUT to develop more distance learning modules and enlarge their open course ware systems comparable to the MIT open course ware system.

The fourth theme, finally, supports the profiling of DUT in the area of sustainable, technological solutions contributing, specifically, involving third/second world development stakeholders increasing the societal relevance of technological development.

Each of these themes equally contributes to internationalization of the curriculum. The four themes of Flower projects are: (1) 'International projects': students of DUT work together with students of foreign universities in a joint project and deliver a joint product, design or activity. (2) 'Internationalization at home': students enlarge their intercultural awareness by; for example, improve their intercultural communicative competencies by taking workshops within regular classes. (3) 'Internationalization & ICT': foreign and local students follow a joint module via ICT applets and local field/home work. (4) 'International Entrepreneurship & Development': students work at technical sustainable solution for global problems. We will discuss the development and results of five Flower projects, covering all categories.

### **3 ONE THOUSAND FLOWERS: EXAMPLES**

In this section five of the in total 22 Flowers will be briefly discussed. These Flowers have been chosen as they are the most ahead in the implementation of their project plan. We have asked the four project owners to write their own contribution to this paper on the basis of four central questions. (1) What is the objective of your Flower? (2) Which internationalization aspect in your instructional setting did you want to address with your Flower? (3) In what way did you intend to achieve the result? (4) Which lessons have you learned so far?

#### **3.1 Minor International Entrepreneurship & Development by Esther Blom**

*This Flower was initiated by Delft Center of Entrepreneurship. The Flower is an example of the "International Entrepreneurship & Development category".*

The Delft Center for Entrepreneurship developed a minor program called "International Entrepreneurship & Development". The program aimed to attract students with in interest in engineering in developing countries. The program covers one semester and is open to all third year bachelor students. The first batch of students started September 2008. The program is made up by the following courses Social Entrepreneurship, History of Technology, Collaborative Business Design, Technology & Global Development, Business Finance & Marketing, and Communication & Cultural Diversity. Sustainable development, social issues, and entrepreneurship were addressed in all these courses. The theory as taught in these lectures is applied to real-life case studies. These projects were initiated by NGO's and entrepreneurs that face challenging issues relating to engineering and development. The students studied the case and published a report on their solution and ideas. An example of such a project is "Plakkies". Students set up a flip-flop factory in South Africa producing flip-flops from recycled materials. This initiative creates employment possibilities for HIV infected women in the townships of Durban. Profits made by the factory are reinvested in society through prosperity projects for children organized by the KidsRights foundation. Most students, who attended the course, were touched by the subject. This reveals their interest in contributing more of their time to sustainable development. In September 2009 the second edition of this minor program will be offered. The number of students enrolling in this course has already doubled as compared to the previous year! The Flower project funded the exchange of information with the other participants and a number of guest lectures.

#### **3.2 Sense your world! By Rob Kooij**

*The Flower "Sense your World" was initiated by the department of Telecommunications at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS). The category of this Flower is "Internationalization at Home".*

The Department of Telecommunications has many employees from non Dutch descent: just the PhD students originate from 12 different countries! The "Sense your world" Flower aims to explore this diversity. The main aim of "Sense your world!" is to collect opinions from people in the countries where PhD and MSc students are from about certain fashionable and technological developments. We aim to enhance the cultural awareness of all students by having them share their heritage through involving their relatives in this project.

As the name of the project suggests, the students ask people from different continents of the world about their opinions on the applicability of sensor nodes. The reason to choose this subject is that wireless sensor and RFID technologies are hotspots in both the academic and industrial domain. The wireless sensor endpoints will likely rise to 41 million worldwide in 2010 and the market is expected to be as high as \$5.3 billion. However, this skyrocketing depends on the spread of recognition of the

technology and the desire of the applications. Therefore, we want to collect the opinions of people from every corner of the world. This way telecommunication students learn to acknowledge diverse opinions on new technology and engineer solutions that meet people's needs. Whenever PhD or MSc students return to their home country, they conduct interviews with a (grand) parent (or a member of another generation than their own) and tape this with a video camera. Interviews are conducted in the mother tongue of the student. The interview starts with a few general questions about education. Examples questions are "What kind of education did you receive?" and "What educational means were used?". The interview proceeds with a few general questions about ICT, for instance "Do you frequently use computers?" and "Do you have a mobile phone?". The final part of the interview focuses on sensor nodes. The student shows a sensor node, see Fig. 2, to the (grand)parent and asks, amongst others, "What do you think this is?" and "How much do you think the device costs?".



**Fig. 2: A sensor node**

When the student returns to Delft, the camera is handed over to the project team. The student makes an English translation and subtitles of the interview for the project team. The goal of this Flower is to make video clips in 10 countries. All clips will be placed on a designated website. So far, the project has yielded interviews in the following countries: Ethiopia, China, Nigeria, Poland, Spain, Sweden and Uzbekistan. Fig. 3 shows a screen shot from the interview conducted in Uzbekistan.



**Fig. 3: Interview in Uzbekistan**

Additional interviews are planned in Portugal, Iran and Germany. The project is currently working on the translation of the interviews into English and arranging the subtitles. The "Sense your World!"-website is being designed at the moment. When the project is finished, we will contact external parties that might be interested in the cultural aspects of the project, such as documentary makers, journalists and cultural organizations. A recent spin off of this project is an increase in interaction between PhD-students of different cultural origin, sharing their experiences.

### **3.3 Master Introduction week, by Dagmar Stadler**

*This Flower was initiated at the Faculty of EEMCS. The Flower falls within the theme of "Internationalization at Home".*

At the faculty of EEMCS approximately 50% of the master students are from abroad. Between arrival in the Netherlands and starting the program, there is little time to introduce key figures, inform the students about the program and the Dutch educational system. Also, foreign students would like to mingle more with Dutch students. On the other hand, Dutch students need to learn intercultural communication and skills. To facilitate this, two master programs will kick off by an introduction week. All first week lectures will be offered off campus and students stay overnight. This way we 'force' the students to interact. Next to the regular courses, six students of different backgrounds form a team that works on an interdisciplinary project. The projects are designed in such a way that students rely on each other's specialist knowledge and experience. To support the students in developing intercultural communication skills, they played a negotiation game. In this game teams need to buy information. However, they do not have sufficient funds to acquire all necessary information they need

to win the game. Students are allowed to buy information from other teams, but selling information will diminish their chances to win the project competition. Throughout the week the students have the chance to get to know their lecturers and the key persons in the program and to familiarize themselves with the Delft education system. In addition, the students have plenty of opportunities to socialize and have fun. The opportunity to participate in the Flower project has greatly helped to have this program materialize: staff and participants of the Flower project shared their ideas and experiences about similar projects at TU Delft.

### **3.4 Intercultural Virtual Seminar, by Otto Kroesen**

*This project falls under the categories “International projects and Internationalization & ICT” and was initiated by the philosophy section at the Technology, Policy and Management (TPM) faculty.*

The intercultural virtual seminar was organized by the Faculty of Technology, Policy and Management. The seminar aims to connect students from Delft, Kenya and Ethiopia and work jointly on finding low tech solutions for local problems. The Intercultural Virtual Seminar (IVS) initiative started in 2008. Within this framework two Flower incentives were awarded: one to support a workshop on intercultural virtual communication and another to cover the costs of the African students involved in participating in the IVS. Within the actual IVS, students from Ethiopia, Kenya and the Netherlands work on solutions of socio-technical problems in Africa by means of virtual communication. Currently nine students in Delft, eleven students in Kenya and eleven students in Ethiopia participate in the seminar.

The first Flower was important because it created an opportunity to develop and agree on a shared approach and set of rules necessary for virtual communication. The workshop addresses the experiences, difficulties and accordingly the solutions/rules for distant teamwork. The workshop specifically focused on problems relating to Africa, like the special requirements of low connectivity and the cultural differences. The workshop set the stage for the technology and the methods used for the Intercultural Virtual Seminar itself. It made especially the teachers aware of the pitfalls involved so that they were prepared to manage them. It also was important in that other teachers participated in the workshop, who were involved in similar projects so that they too could learn and share experiences.

In the project itself, the students developed questionnaires to collect information on energy, clean water and solid waste problems in the slums in Kenya and Ethiopia. Students worked together to develop a framework to better understand the problems and to analyze what solutions were feasible and efficacious.

The primary lesson to be learned from the IVS is the fact, that communication across cultural diversity takes an extra effort. The learning goal of the IVS was formulated as: work on socio-technical solutions across cultural differences, and to be capable to operate in such a context. This takes due preparation, a clear set of rules and also attentive management of the tutors. Maybe the most important lesson is that it cannot be done within the framework of a longer-term partnership or commitment from all the partner institutions involved. Without that, misunderstanding, irritations, etc. cannot be overcome. If such a partnership is in place short-term failures can be connected to a long-term process of success.

### **3.5 The Policy-Flower: Intercultural workshop for reflecting on cultural flavors of policy analysis styles, by Niki Frantzeskaki and Alexander de Haan**

*This Flower was initiated at Engineering and Policy Analysis (EPA) department at the TPM Faculty and falls in the category of “Internationalization at Home”.*

Policy analysis students are taught methods and tools to deal with complex societal problems, to analyze them systematically and consistently towards feasible and robust alternatives. It is often the case that course instructors are confronted with remarks or questions from international master students that address the following: *“These methods might work in an ideal or well-structured sociopolitical system, but in our country they will not work”*. Being alerted by this comment, we introduced an intercultural exercise in the form of a collaborative workshop to policy analysis master students in the introductory course of the policy analysis methodology.

In the policy analysis workshops, students experience and apply the methodology of policy analysis that is mainly to analyze the problem by rationalizing it. Concerning the intercultural collaborative workshop, students are asked to share their thoughts and experiences with their group mates and to reflect upon *dominant or prevailing policy styles that captures the current practices in policy analysis*

and to indicate *their personal desirable policy style that captures* what they foresee as a needed and useful policy analysis style for their country. Our idea behind this dichotomy is that the prevailing policy analysis style emerges from the cultural context that differs and differentiates every country. The desired policy analysis is a reflection of the novice analysts on the wished and useful policy practices for an improvement of the policy making process as it is currently practices in their home countries.

To further reflect and address the intercultural complexities, students are also asked for an indication and reflection of the Hofstede's dimensions for their country and for them personally by requiring them to fill in Hofstede's questionnaire. Last but not least, the personal stories shared with group members during the workshop were asked to be briefly reported with the individual assignment of the all the students participating in the workshop. We need here to note that our master class has a high intercultural character, with students from different countries with different backgrounds and working experiences.

For the design of the intercultural workshop, the Flowers project team aids us with discussion and interaction workshops and sessions, where we co-designed the task list of the workshop and shared experiences about teaching multi-cultural groups. In this interactive and dialectic way between educators from different departments of the University as well as between educators and education researchers, we revised and self-improved our teaching approaches as well as our facilitation approach towards multi-cultural groups.

After realizing two intercultural workshops, one in October 2008 and one in March 2009, we as educators adapted or realized that we had to adapt to a new way of grading; especially when warrants or assumptions of policy arguments have a cultural "flavor". In Frantzeskaki, N. et al, [7] is presented how the answer of a student in the final exam shows how his experience in his country is translated in a policy argument about uncontrollable factors. The responses of the two professors who graded his exam show how we adapted and realized the influence of cultural identities in policy warrants and the student did not get penalized (fail the exam) for their cultural background.

Our experience with the Policy-Flower shows that apart from stimulating and motivating students to reflect and realize multicultural complexities, educators can learn to recognize cultural identities, be prepared to face them and not penalize students due to assumptions or perceptions that are not in line with the Western thinking that is often dominant in rational models and formal methods of decision making. Educators have to reveal to both students and other educators how to incorporate and reflect on cultural 'flavors' in education.

## **4 CONCLUSIONS**

Although most Flowers still have to be finalized, the above results already show the positive spin off of the Flowers project. Immediate offshoots of the Flowers project are:

1. The increase in cooperation of lecturers interested in incorporating internationalization into their courses. Lecturers have contacted one another to share experiences also beyond the formal support structure of the Flowers project
2. The dissemination of tacit knowledge on the implementation of an international dimension in courses. Much of the experiences and knowledge amongst lecturers remained invisible and did not receive due attention from the central board to be of use to the entire university. In the present project the knowledge and experience become visible and available to the entire university audience
3. The distribution of best practices amongst university staff. As these practices become shared in the university more lecturers become enthusiastic to contribute or to acquire information of the Flowers project or immediately with their colleagues next door. Learning from one another creates a more socially integrated institution.

Last but not least it instigated an initiative of lecturers and policy makers to join forces to rewrite the present policy document on internationalization. Rewriting is particularly focused on the internationalizing of the curriculum and course levels, instructional approach and coaching of international students including a definition of boundary requirements for a good quality of our international university. Other internationalization issues are tackled by different stakeholders. The Centre of Expertise in Education FOCUS has the idea the best is yet to come.

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