

Paper 40. Experiences from an International Training Programme on ESD in Higher Education at Chalmers University of Technology

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Abstract

The Swedish International Development Cooperation Agency (SIDA) is funding, as part of its bilateral development assistance, International Training Programmes (ITPs) to support social and economic development in developing countries. Niras Natura (previously Ramboll Natura) has since 2008 organized an ITP on ESD in higher education together with Rhodes University in South Africa and the last two years also with Tongji University in China. The ITP is implemented in cooperation with UNEP and seeks to support the Global University Partnership on Environment and Sustainability (GUPES) initiative. The participants in the ITP come from universities and ministries of education (or similar) in Africa and Asia. Participants from universities typically belong to the staff of teachers/researchers or university management. All participants have their own change project for ESD with the purpose to enable participants to link the learning from the ITP to their own work context and institutional priorities. The ITP is going on for almost a year and includes several phases where the participants mainly work on their change projects at their home university (or ministry). Early on in the ITP, the participants spend two weeks at universities in Sweden and since the start of the ITP in 2008, the participants have spent their last week in Sweden at Chalmers University of Technology, with the purpose to share knowledge and experiences in ESD and institutional change at universities. Chalmers has a long history on ESD since the 1980's and is constantly working to improve the quality and increase the quantity of ESD in the educational programmes. The aim of this paper is to evaluate how an ITP like this can contribute to ESD and institutional change at universities. The objectives are to find out which influence Chalmers' contribution to the ITP on ESD in higher education has had on: 1) change projects and other ESD activities of the participants and 2) the ESD work at Chalmers. We have sent out a survey to participants in the ITP and another survey to lecturers at Chalmers who have contributed to the ITP. Some results are that people at Chalmers have got an opportunity to reflect upon the ESD work that they have done so far and for the future. The sharing of experiences has been inspiring and increased the engagement.

1 Introduction

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two weeks at universities in Sweden and since the start of the ITP in 2008, the participants have spent their last week in Sweden at Chalmers University of Technology, with the purpose to share knowledge and experiences in ESD and institutional change at universities. Chalmers has a long history on ESD since the 1980's and is constantly working to improve the quality and increase the quantity of ESD in the educational programmes.

The aim of this paper is to evaluate how an ITP like this can contribute to ESD and institutional change at universities. The objectives are to find out which influence Chalmers' contribution to the ITP on ESD in higher education has had on: 1) change projects and other ESD activities of the participants and 2) the ESD work at Chalmers.

2 The content of the ITP and the ESD work at Chalmers

The ITP was first managed by Michael Ward (2008) and Anna Olsson (2009) at Ramboll Natura and from 2011 by Marie Neeser at Niras Natura (previously Ramboll Natura). The first year there were participants only from Africa but since the second year, half of the participants were from Asia. Heila Lotz-Sisitka at Rhodes University in South Africa was the pedagogical leader during the first year. Michael Ward was the pedagogical leader during the second year together with a representative from the Asian Institute of Technology. Heila Lotz-Sisitka has continued as a pedagogical leader from 2010 together with Dahe Jiang (2011) and Fengting Li (2012, 13) at Tongji University in Shanghai. The ITP was first organized in collaboration with MESA (Mainstreaming Environment and Sustainability in Africa) and in later years with GUPES.

During the first two years of the ITP, the participants spent three weeks in Sweden and since 2010 two weeks. During these weeks, the participants have visited Stockholm Resilience Centre, Uppsala University, and Chalmers University of Technology. The purpose has been for the participants to learn about: sustainable development, ESD, and how to work with ESD at a university.

Chalmers was asked to contribute to the ITP as a good example for how a university can work with ESD. Chalmers has a long history on ESD since the 1980's and is constantly working to integrate ESD and SD in under the vision "Chalmers for a sustainable future". John Holmberg has been a UNESCO chair in ESD since 2006. And at the time, there was a large ESD reform project running at Chalmers (from July 2006 to June 2009), which was funded by the Chalmers management [Holmberg et al., 2012]. The purpose of the ESD project was to integrate ESD into the ordinary structures of the university to secure good quality of ESD. The ITP fits well in international training responsibility taken on by Chalmers: hosting the conference "Knowledge and learning for a sustainable society" at the EU top meeting 2001; hosting the conference "Learning to change our world – the Göteborg consultation on learning for sustainable development" (a conference offered by prime minister Göran Persson in Johannesburg 2002); arranging a series of expert workshops in ESD, e.g. "Drivers and Barriers for implementing sustainable development in higher education" in Göteborg December 7-9 [Holmberg & Samuelsson, 2005]. The idea of using Chalmers as an inspiring example for how to work with ESD and SD is also central in the agreement between UNESCO and Chalmers regarding its chair in ESD.

The participants have spent one week at Chalmers every year. The main purpose of this week is to share experience of the ESD work at Chalmers. To give a broad description of the ESD work at Chalmers, the invited speakers come from different parts of the organization and have different functions such as: vice president, head of center, environmental coordinator, teacher, and student. A typical session is 1 hour and 15 min long and starts with a presentation that should not take more than 45 min to give room for a discussion that should at least get 30 min. The invited speakers are asked to talk not just about positive results but also about change processes, including challenges and disappointments. Ulrika Lundqvist has

been the local coordinator for the ITP since the start, and was also involved in the ESD project. The content of the week at Chalmers has changed over the years to give an updated description of the ESD work going on at Chalmers, but there are also some parts that have been included in all (or most) of the years.

An appropriate structure that can be used to describe the part of content in the ITP that is about ESD in curricula is the four steps in a backcasting approach [Svanström et al., 2008]: 1) description of goals to where one should aim; 2) present state analysis in relation to the goals; 3) good examples that are in line with the goals; 4) strategies or measures for how to go from the present state towards the goals, i.e. the change process. Additional content in the ITP are: greening of campus and ESD in its university transition context.

2.1 Description of goals

Description of goals for the curricula is necessary to create a shared vision of in which direction one should aim towards. The description can be used later for analyzing the present state and to decide on relevant strategies and measures towards the goals.

A set of learning outcomes for courses in environment and sustainable development have been developed at Chalmers and are presented in the ITP [Segalàs et al., 2009]. At Chalmers there is a local course requirement that all students should have five full time weeks of study (i.e. 7.5 ECTS) in environment and sustainable development in their education, since 1985. This requirement is fulfilled by different courses in the different educational programmes, which are usually adapted to be relevant for the respective fields of engineering (and for architecture). However, there is no official description of what should be included in these courses and the educational programme directors and the teachers can make their own interpretations. The learning outcomes were developed as a part of the ESD project to secure good quality in these courses and programme directors and teachers were invited to take part in the process.

In another project at Chalmers, the industry's needs of competences in sustainable development were investigated and the results are presented in the ITP [Hanning et al., 2012]. One of the purposes of the investigation was to give input to a further development of the learning outcomes and of the courses in environment and sustainable development. The results show that especially the economic dimension of sustainable development should get more attention in the courses.

2.2 Present state analysis

The present states of educational programmes and courses have to be analyzed on a regular basis in relation to the goal, e.g. described as learning outcomes. The results of the analyses can be spread at the university with the motto that the quality of the courses should not be the responsibility of just the involved teachers but should be a concern for the whole university. The results of a present state analysis that has been performed at Chalmers have been presented at the ITP [Lundqvist and Svanström, 2008]. The purpose has been to show an example of a methodology for how an analysis can be done and to show examples of problems that can occur in the courses.

2.3 Good examples

Educational programme directors and teachers can learn and get inspiration from good teaching examples. Preferably the examples should be within the same educational field. The examples can come from the same university. The ITP has included both presentations of some good teaching examples as well as a presentation about a project with the purpose to collect and spread good examples within Chalmers [Holmberg et al., 2012].

2.4 *The change process*

Advice for successful change processes constitutes a major part of the ITP. Three important components for successful change project at Chalmers are presented [Holmberg et al., 2012]: 1) a neutral arena; 2) individual engagement and involvement; and 3) commitment from the management.

Every year in the ITP, the Centre for Environment and Sustainability (GMV) has been presented as a *neutral arena* that has been of great importance for the development of ESD at Chalmers. GMV is placed outside the organization of the research departments and can in this way avoid lock-in effects and make researchers from all departments feel welcome to take part in its activities. GMV work as a platform for cooperation and information exchange, and can function as an engine for issues that otherwise often become everyone's interest but no-one's responsibility.

Examples of methods to create or support *individual engagement and involvement* are presented in the ITP, such as the individual interaction method (originally from Delft Technical university) and workshops for teams of teachers in educational programmes. Universities, with their core values of scepticism, curiosity and freedom of speech, have a high degree of autonomy, which must be respected in a change process. Teachers hate to be taught! The change process must therefore build on the engagement and involvement of individuals.

A clear *commitment from the university management* definitely facilitates a change process and can be necessary. The ITP includes a description of how the ESD work has developed since the 1970's at Chalmers, from a bottom-up process driven by a few enthusiastic teachers to become a balanced top-down/bottom-up process with a clear commitment from the management. The role of the university management can be to clearly motivate the change process and systematically create incentives and other structures that correlate with the change process.

Besides these three components, engaged students can play an important role in a change process. The student organization Chalmers Students for Sustainability (CSS) has had a presentation in the ITP most of the years. CSS has been very active and visible at the campus the latest years and has increased its memberships.

2.5 *Greening of campus*

Every year, there has been a representative from the Environmental office at Chalmers who have had a presentation and in later years also from the company Chalmersfastigheter, which owns and maintain a large part of the buildings at Chalmers. The presentations have included examples about: taking care of waste for recycling, travel policy for employees, green areas at the campus, the introduction of an environmental management system ISO 14001, and construction of a building with reduced environmental impact. The presentations have always been complemented with a guided tour in some part of the campus.

2.6 *ESD in its university transition context*

Since education is linked to research, innovation and the overall management of the university a part of the ITP has been devoted to put ESD in its context at Chalmers. Chalmers has been active in implement the vision of "Chalmers for a sustainable future" by increasing collaboration and lowering barriers within the university itself as well as between Chalmers and external stakeholders. The result was a new "virtual" matrix structure of the university, accomplished through eight Areas of Advance. Each Area of Advance constitutes a neutral arena for transformation by providing meeting places where research, education and innovation activities at Chalmers can be internally linked and made visible to the surrounding world. The Areas of Advance provide Chalmers with excellent possibilities to collaborate

with business and society in regional knowledge clusters by providing a framework to work concurrently with operational bottom-up and strategic top-down processes for a sustainable future.

3 Method

3.1 Surveys to the participants

We have sent an electronic survey to all the participants since 2008, i.e. approximately 110 people. We have got only 14 answers: 1 from 2008, 5 from 2009, 4 from 2011 and 4 from 2012. As a complement to our own survey, we also present some results from the survey made by SIDA in 2011, 2012, and 2013. The response rate was 100% in all years, i.e. 25 respondents in 2011, 32 in 2012, and 31 in 2013.

3.2 Survey to lecturers at Chalmers

We have sent out a survey to the lecturers at Chalmers who have contributed most to the ITP over the years. The persons who have answered the survey are listed in table 1.

Table 1: Lecturers who have answered the survey.

Marie Arehag	Has been involved in many reform projects with the aim to improve the quality of education, e.g. the ESD project
Andreas Hanning	Has performed a study about competence needs for ESD in industry and has an employment at the department for Shipping and marine technology
John Holmberg	Is the Vice President for sustainable development and holds a UNESCO chair in ESD, and has been involved in the ESD project as well as other ESD activities
Jennica Kjällstrand	Is the environmental manager and involved in activities about sustainable campus and the environmental management system
Ulrika Lundqvist	Is working as a pedagogical support person for ESD and has been involved in the ESD project as well as other ESD activities, and is also a teacher in courses for SD
Magdalena Svanström	Is the head of the Chalmers Learning Centre and has been involved in the ESD project as well as other ESD activities, and is also a teacher in courses for SD

Ulrika Lundqvist has also been acting as the local coordinator for the ITP at Chalmers. Which means that she has got an opportunity to participate at all sessions during the week at Chalmers and to get some more contact to the participants compared to the other lecturers who usually only take part in their own session.

The questions that the lecturers were asked to answer are: 1) How do you perceive that your contribution to the ITP can have had an impact (also indirectly) for you and your work? 2) How could your contribution to the ITP have been different in order to increase the impact for you and your work?

4 Results

4.1 Survey to the participants

The participants who have answered the survey had different types of employment at the time for the ITP but most of them worked as teachers at a university, see table 2. There was also a variation in change projects but most of them were about course development, see table 3.

Table 2: Employments of the respondents. It was possible to choose several alternatives.

Employments	Number of respondents	Share of respondents
Environmental manager at a university	0	0%
Teacher at a university	9	64%
Educational programme director at a university	1	7%
Part of a university management	6	42%
Employed at a national ministry	3	21%

Table 3: Topics for the respondents change projects. It was possible to choose several alternatives.

Change project	Number of respondents	Share of respondents
Campus greening	3	21%
Course development	10	71%
Educational programme development	3	21%
Development of policy document for the university	0	0%
Development of policy document for the country	2	14%
Other topic	1	7%

Out of the few respondents, 92% have answered that they were “very satisfied” (grade 5 out of 5) about the week at Chalmers and 7% that they were “rather satisfied” (grade 4 out of 5). This result can be supported by the results from the surveys made by SIDA (with a response rate of 100%), see table 4.

Table 4: Results from the surveys made by SIDA to the participants in the ITP in 2011, 2012 and 2013. The maximum (i.e. the most positive) grade is 5.

Question	2011	2012	2013
How do you consider the IMPORTANCE of the following "part" of the ITP: Institutional Change in Higher Education (Chalmers)?	4.92	4.88	4.90
How do you consider the PERFORMANCE of the following "part" of the ITP: Institutional Change in Higher Education (Chalmers)?	4.88	4.81	4.84

On the question if there were any specific parts or content during the week at Chalmers that have been useful for them in their change projects in the ITP or in later work on ESD: 92% of the respondents answered “yes, to a large extent” (grade 5 out of 5) and 7% “yes, to a small extent” (grade 4 out of 5). Table 5 includes parts that have been mentioned by the respondents as useful for their change projects. Ways in which the respondents have used knowledge and inspiration from the week at Chalmers, either in their change project in the ITP or in their later ESD work, are listed in table 6.

Table 5: Parts or content that are mentioned by the respondents as useful for their change projects. The result is based on interpretations of the free answers from the respondents.

Parts or content that have been useful for the change project	Number of respondents	Share of respondents
Internal environmental work	3	21%
Curriculum development	4	29%
Student engagement	5	36%
Institutional structures and change	4	29%

Table 6: Ways in which the respondents have used knowledge and inspiration from the week at Chalmers. The result is based on interpretations of the free answers from the respondents.

Ways to use knowledge and inspiration	Number of respondents	Share of respondents
Sharing with and involving colleagues	4	29%
Sharing with and involving students	4	29%
Curriculum development	6	43%

In one of the questions of the survey, the participants were asked to give suggestions for how the week at Chalmers could have been different to have been more useful for them. Three of the respondents suggest more interaction with students. Some other suggestions are to include field visits, e.g. to recycling industries and innovative technologies, and classroom visits and more interaction with teachers. Another suggestion is that there could be more cultural sharing and that participants could take a more active part and have presentations about their countries. In the last question in the survey, the respondents got an opportunity to add some final comments. In two of the answers there are suggestions to arrange an alumni conference for the participants with the purpose to share experiences from successful change projects.

4.2 Survey to lecturers at Chalmers

Some important factors that have been mentioned for how the lecturers perceive that the IPT can have had some impact for them and for their work are summarized in table 7 and are described in the text below.

Table 7: Important factors that have been mentioned by the lecturers at Chalmers

Lecturer	Reflection on ESD and own work	Energy, inspiration, motivation	Knowledge and experiences from participants	Continued contact with participants	Chalmers has become more well known
1	x	x		x	
2	x	x		x	
3	x	x	x	x	
4	x		x	x	x
5	x			x	x
6	x	x	x	x	

All of the lecturers consider that the IPT has given them an opportunity for *reflections* on ESD and on their own work. It is mentioned by one of the lecturer that there has been opportunities for reflections both when preparing the presentations as well as in the discussions with the participants. According to one of the lecturers it has also been an opportunity to reflect on change processes and success factors and that it has helped her to better understand her own work and how to continue. Another lecturer mentions that he has got an opportunity to reflect on the present situation at Chalmers and how it can be improved. One of the lecturers does not think that it has given her so much the last years since there has been a lack of direct connection to her present work.

Four of the lecturers have explicitly mentioned that taking part in the ITP has given them some *energy, inspiration and motivation* for their continued work. Some possible reasons for this that have been mentioned are the awareness of that you are not alone struggling with similar challenges, and the possibility to share these challenges and frustrations with others. However, one of the lectures also mentions a frustration about the ESD work at Chalmers and a wish of a joint analysis about how to move forward.

One of the lecturers mention that it has been valuable to get some *knowledge about ESD work in developing countries*, e.g. about collaborations with communities. However, it is also mentioned that we could have tried to have more dialogue with the participants to get some feed-back on our own ESD

work. The local coordinator at Chalmers for the ITP also mention that it has been valuable for her in her role as a pedagogical support person for ESD to get information from the other lecturers about their present ESD work and about their challenges.

All the lecturers mention *continued contact with the participants* as an important factor. However, with some exceptions it has mainly been in the form of a few e-mails. Some of the lecturers mention that they have been uncertain about how to continue to keep in contact with the participants and for which purposes. One of the lecturers is especially frustrated and sees it as a failure.

Two of the lecturers mention that the ITP has contributed to make the ESD work at *Chalmers more well-known internationally*. It is mentioned as important both for the individuals whose work is spread as well as for Chalmers in general.

5 Discussion and conclusions

It can be concluded that the participants as well as lecturers have been very satisfied with taking part in the week at Chalmers in the ITP. The lecturers express that it has been valuable for them as individuals and the participants mention that they have shared their gained knowledge and experiences with colleagues and students and that it has resulted in some curriculum development. Our overall conclusion is that Chalmers through this IPT has been successfully working as a good example in ESD, which is in line with the high ambitions of the university. The five years period of funding from SIDA is now to its end and it is uncertain how the ITP in ESD will continue. GUPES can certainly play an important role for its continuation.

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