Education for sustainable development on the teacher training program at the University of Gothenburg

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Abstract
The work to incorporate sustainable development into courses at university level is a complex task. It is therefore a challenge for everyone involved in the teacher training program at any university. At the University of Gothenburg, Gothenburg, Sweden, the main compulsory course involving sustainable development is given during the first semester of the teacher training program. This is the only sustainable development course that all the students have in common, but some of the students have other courses, that will be described in this article. The details of the main, common, course is outlined in our other conference paper and summarized here together with examples of other courses within the teacher training program where sustainable development is incorporated. Although the present concept is accepted and works well, ideas of further development needed for better incorporation of sustainable development in the teacher training program will be presented and discussed covered. In summary the concept at University of Gothenburg can be said to represent one of very many ways of dealing with sustainable development in teacher training programs, both nationally and internationally.

Keywords
University of Gothenburg, Teacher Training, Start Keys

1. Introduction and background
Education for sustainable development, ESD (Education for Sustainable Development) should be seen as clearly distinct from traditional "environmental education." Rather than teaching about the environment and nature (how human activities affect and are affected by its condition), we have to deal with an approach where the relationship man - environment is a process in which the two quantities should be an equal footing. Quite often it is other
people (in the present or future) which are mainly experiencing the consequences. Should sustainable development be achieved, people need to have insights on how their behaviors and choices affect not only the environment but also, therefore, themselves and other people. The basic idea behind ESD is that with the right skills and knowledge introduced early in life – already in early school years – it is more likely that people will reflect on the consequences of their way of life, which hopefully leads to a society based on more well-considered decisions and documents: a sustainable society (Sandell et al., 2005).

Sustainable development and education for sustainable development is a complex and demanding task for teachers at teacher training programs at any university (Henze, 2000; Axelsson et al., 2008). University of Gothenburg, Gothenburg, Sweden, have chosen to include it as a substantial part of the first semester of the teacher training program for more than 1000 students each year. The course is presented in our other article “Education for Sustainable Development in the Program for Teacher Training — Start Keys” while this article will focus on the possible development of the program and other courses including sustainable development.

With the combination of educational and professional skills of teachers from many different departments the students experience a creative and strong educational environment where sustainable development is included in many parts of their education.

The complete teacher training program is a common frame work for the whole vocational education for future teachers. The program is divided into almost 40 focus areas where the students can focus their studies according to the subjects and school level they are aiming at. The length of the education differs between 180 and 330 higher education credits (hec), equivalent to 180 to 330 ECTS, depending on if the students will be working at pre-school or upper secondary school or levels in-between. Because of this diversification it is important to have a common course in sustainable development during one of the semesters where the students actually study together. This gives them a common ground to start from, and an easy way to share experiences from different focus areas. On the other hand it might force the course to be too general and not as deep as some teachers and student wants it to
be. To include this course for all students is supported by the intention of the decade for education for sustainable development (United Nations General Assembly (UNGA), 2002). After the first, common, course in sustainable development the student have not only worked with sustainable development, but are also trained presenting, discussing and argue for the content in a multimodal way and in reports aimed at different target groups. All these aspects are important in their continued studies, as will be exemplified in this article.

2. Course description “Knowledge forming and sustainable development”

After completing the common course “Knowledge forming and sustainable development” the students should have deepened their approach to knowledge, created an understanding and insight of the changing nature of knowledge. The effect on the perception of the education for sustainable development is also scrutinized. The course focuses on the connection between the interpretations of knowledge from different perspectives and the contribution to the development of a sustainable society. Based on this the students should be able to select methods and an appropriate way of organizing their own pedagogical work. The course supports and encourages a critical and reflective approach to sustainable development by providing different perspectives on the topic through lectures, textbooks and seminars.

After finishing this course the student will to be able to

• respond to the ethical issues and the democratic processes that are linked to mankind and its contribution to a sustainable society,
• explain orally and in writing the knowledge complexity from different contexts (school, the scientific community, the surrounding community) and perspective (the teacher, the learner, authority, gender) as well as uncover and analyze the argument used to justify different positions,
• using digital tools to discuss and reflect on a pedagogical idea on Sustainable Development.

The scientific knowledge available and needed to achieve sustainable development of the course is emphasized by treating "sustainable development" as a central concept to ensure that current needs are met without compromising the needs of future generations.
Theoretical knowledge should be applied in practical action with implications on both individual and group level.

The documents governing the school work at all levels of education (Swedish National Agency for Education, 2006c; Swedish National Agency for Education, 2006a; Swedish National Agency for Education, 2006b; Swedish National Agency for Higher Education, 2009) stipulate that all schools should work with the concept of sustainable development, but the interpretation of the documents varies from school to school (Axelsson, Sonesson et al., 2008). To meet these demands knowledge of responsibility and justice as well as training skills is required. This is essential for preparing children and young people for the coming changes and challenges and thus a central part of the course. The course also deals with the influence of our lifestyle and the tools needed to prepare students to make informed choices, participate in democratic processes and thus contribute to a sustainable development of our society.

An essential part of the course is a project aiming at providing a better understanding of education for sustainable development where students work in groups with a didactic approach to sustainable development. Based on their own interests and focus areas in the teacher training program, the students select one aspect of (education for) sustainable development for their project. They identify and form a clear theoretical foundation of the group project partly based on their comprehension of the knowledge development and observation methods in an earlier part of the semester.

The emphasis of the course on sustainable development is underlined by combining a didactic perspective with an academic or school discipline in the project. Both parts are needed. With the supervisor as a discussion partner the initial discussions and brainstorming by the group results in a proposal of an idea for a theme of the project, with emphasis on education for sustainable development in a school or class. The supervisors do not supply the ideas for projects, but this comes from the students during the initial discussions, using the combined knowledge, ideas and experience of the group members.

The project will train the students transposing texts for different target groups since they need to present the use of the project outcome for two different target groups. One report is written for an academic audience while to other is intended for pupils in the school. The group also produces a multimodal slideshow - a "start key" for learning sustainable development. The main, academic, report should work as a user's guide for the multimodal
presentation of the project, documenting the objectives, concepts, methods, and implementation of the education for sustainable development idea of the group work. The slideshow is designed to introduce the selected sustainable development aspect to the school pupils. It consists of text, images, graphics and audio to introduce (education for) sustainable development to the pupils. Over the years of development of the course and course concept we have noted a change in attitude among the students. Initially many students had the opinion that the professional relevance of ESD was very low. The growing interest in sustainable development in the society can now be seen since the initial reluctance to work with ESD now is gone.

Just like the students, the teachers and supervisors at both the university and the school where the students do their practice, have a varying knowledge of and attitude towards ESD. This point to a continued need for ESD education of teachers involved in this course, on all different levels. This is a situation that is not unique for Sweden (Lozano-Garcia et al., 2008). As one tool to deal with this educational problem, the “Start Keys” for the education for sustainable development, produced by students in the Program for Teacher Training at The University of Gothenburg, can act as inspiration to work with sustainable development in education.

3. ESD and Home and Consumer Studies in Teacher Education program

This is the first example of a set of courses that the students on the teacher training program can take, if they specialize on the direction of household and consumer studies. The department of Food and Nutrition, Science and Sports at the University of Gothenburg has chosen to integrate Education for Sustainable Development (ESD) in the entire degree specialisation of the household and consumer studies in the teacher training program.

Household and consumer science deals with the very core aspects of sustainable development such as health, resources, environment and globalization. Based on the different dimensions of sustainable development the course management developed courses with an integration of general courses, internship, focused courses and specialization courses. In all courses the sustainable development aspect is integrated with didactic elements as well as relevant academic subjects with the goal for the students to develop their attitude towards ESD. Examples of such integrated courses are Everyday Family Life (15 hec), which provides a knowledge base on sustainable development from a household perspective and Food and Meals in a Sustainable Society (15 hec) to increase their
understanding of sustainable use of foodstuff and sustainable ways of preparing meals. There are also courses to inspire students to think about future and global perspectives.

One of the students’ tasks is a project to replace the food, snacks and beverages of a student cafeteria with more sustainable products. Other projects include food handling and composition or preparation of meals. Labelling of food, seasonable choices, transportation and imported food in relation to locally produced food are also taken into account. Research reports and information technology are often used to assess the relationship between food trends and sustainable development.

During the development process the department noticed the importance of using tools that the students later can use in their own teaching. It could for example be development of a game that they later could use in the schools during their internship. The development was initiated by a new teacher training program and the results of the first years with the new courses are generally very positive. The students say that they now are able to manage sustainable development in their own learning process as well as in their teaching. Students feel familiar with the curriculum of their program and the perspective it provides (health, resource management, gender and culture) and how it can be interpreted and seen in relation to ESD and sustainable development in itself.

The department also concludes that if sustainable development is integrated with other perspectives and content, there is no need to mention this all the time. Initially this was done, but it became tedious for the students and their response was not always positive. Both teachers and students feel more comfortable discussing sustainable development after the introduction of the common sustainable development course during the first semester.

4. Design for Sustainable Development at the University of Gothenburg
The second example is selected from the courses dealing with design, where sustainable development can be an important component and vital for the future use of the products and processes that are designed. There is a great potential for designers and design teachers to strive for a more sustainable development. Management of scarce resources can be enhanced by clever design in the process of renewing products or techniques. Technology can play an important part of the necessary change but it is also a matter of changing lifestyles. Therefore, the School of Design and Crafts at the University of Gothenburg has developed the course ‘Design and Sustainable Development'. The purpose of this course is
to convey basic understanding of the ecological, social and economic dimensions of sustainable development and inspire the students to act accordingly. Students, designers and entrepreneurs learn together what can be done to change current trends and what methods and tools are available to change in a more sustainable direction. In this course students learn about design tools, fair trade and quality of life and standard of living. They discuss design for everyone, environmental impact, choice of materials and best practices. The course includes a group project in which participants apply the methodology of ‘Design with Care’ and other methods to propose a sustainable design in one of the areas of product or service design, or visual communication.

The insight that design has a responsibility for a sustainable development is the most important outcome of this course. Designers have a large influence on people’s physical environment, activities and attitudes. This responsibility is advocated as a positive opportunity to help to change the attitudes towards consideration, equality and sustainable development in society.

5. Suggestion for a revision of the teacher training program

Since the responsibility of teacher training education in Gothenburg is said to be a concern of the whole university it opens up a unique opportunity to combine educational and professional skills from all different departments to create a strong education environment for the students. The current common course on sustainable development “Knowledge forming and sustainable development” involves supervisors from different faculties as well as staff from the public school. This gives the students a chance to combine environmental science, sustainable development, observation methods, work place experiences, argumentation techniques, and the use of information technologies (IT) in their studies. One of the outcomes of this part of their education is a multimodal presentation with text, sound and music in a slide show aimed at a school level suitable for their own part of the teacher training program. The group presentations are generally called “Start keys for education for sustainable development” and are aimed at being the starting point for education for sustainable development for the pupils. The development and implementation of this concept is summarized above, in the first part of this article and in more detail in the article “Education for Sustainable Development in the Program for Teacher Training — start keys” also presented at this conference.
A guiding idea for the development team behind the course is progression. The future teachers have to strive to find and design a meaningful way to integrate ESD into their teaching to make it meaningful for both themselves and their students/pupils. It will not be sufficient to teach and provide tools for ESD in the initial course of the teacher training as the case is today. A persuasive approach to this issue requires experience and maturity, two components which few students have achieved in the initial stages of their education. To deal with this future requirement two ESD packages — one big and one smaller — are proposed in a suggested revision of the ESD component in the teacher training program (Boman et al., 2007). The suggestion is based on the results from two surveys conducted among the departments involved in the teacher training program of University of Gothenburg. The surveys were intended to get an overview of the extent and content of components of education for sustainable development that already exists in the program. The results show that ESD is rarely dealt with and that sustainable development is treated very different in the different focus area courses, if treated at all.

5.1. The big ESD package
This package has a strong (and as far as possible, equal) emphasis on the concept of sustainable development, the concept of ESD and didactic aspects of ESD. An introductory module (knowledge building and knowledge concepts) concludes with the introduction of the concept of sustainable development and draws attention to the ethical aspect of ESD. Here the different parts of ESD as well as how to relate to those parts as a teacher are treated. This provides a good transition to the second module, which analyzes the ESD concept in depth and puts it into an ecologically, socially and individually context by asking questions as. How do you implement sustainable development in the classroom? What opportunities and challenges does society face? What development instruments are available? What is the relation between the ecological dimension and the other dimensions?

A strong didactic-oriented part is incorporated into the course, to penetrated different aspects of sustainable development. At the same time ESD is only touched upon, and is covered in more details in a later course, as explained below. The group project from the current course is retained, although reduced in extent since ESD is not treated. The project is done in close connection to the students’ practice in different school environments. The final presentation of this project, including a slideshow with text, pictures and sound, also provides training in communication and rhetoric.
The University of Gothenburg interprets The Swedish Higher Education Act (Swedish National Agency for Higher Education, 2009) that ESD should be integrated into all courses. That means that the students should have further insights into sustainable development during the semesters they read their thematic specialization.

To keep the concept of ESD living throughout their studies, the students are suggested to follow a series of seminars so that they do not lose touch with sustainable development and in particular with education for sustainable development in the period before the conclusion of their studies where the new ESD course is recommended to be placed. It is suggested that at regular intervals (e.g. 1-2 times per semester) practice workshops and seminars are arranged that highlight different aspects linked to the teachers' mission to teach about sustainable development and convey ESD. One way to increase incentives for students to visit these seminars may be to give sufficient credit for active participation. This probably means that the seminar series need to be included in different courses, to make it possible to give credits. Difficult, but definitely doable.

In the current common course, there are many students who believe that the content of the course feels "strange and distant." This objection is understandable. When students go the course, there still have 6-10 semesters left until they are graduated as teachers and have hardly any idea of what it will mean to serve as a teacher — let alone be able to see what their teacher training education should include to make them comfortable with the concept of ESD. If the current course during their first year is the only element of sustainable development they work with this may prove to be poorly invested use of available resources. It is in the final part of the training students have matured in their professional role as teachers to fully reflect on ESD. Establishment of a new course is therefore proposed. It should be given in one of the final semesters and have a focus on the didactics behind ESD. In addition to a introductory lecture on sustainable development and ESD, students should more actively work exclusively with issues of how to get pupils engaged and learning about sustainable development and the requirements this puts on teaching. The course concludes with a practical work for students to disclose planned teaching moments and get this plan discussed by both other students and their supervisor. This new course is a good opportunity to also accommodate and integrate all four perspectives — the historical, ethical, international and ecological — of sustainable development into the curriculum. This course would ideally be administered as a part-time course (in parallel with one or more other courses) to allow time for reflection.
5.2. The “small” package

This proposal has some elements in common with the big package, but is downsized in the last part, the extensive ESD course. The didactic-oriented initial course is suggested to be the start of the small package, as well as for the big package. The incorporation of sustainable development into the thematic specialization course is also included in the small package as is the group project work. The major difference between the packages is that is the small package no new ESD course is proposed, but instead ESD should be incorporated into the thesis project all students must du during the last semesters on the teacher training program to get their exam. The inclusion of a reflective ESD part in the thesis is similar to the way many thesis projects deal with for example the gender issue. To still be able to receive response and be graded on the ESD, it is suggested that students in their thesis integrate a reflective discussion of ESD, focusing on perspectives of ESD that naturally fall within the subject matter of the thesis. This is a less ambitious proposal than the big package, but it has certain advantages. Among other things, you can use the supervisors teaching in the sustainable development course in the first semester for the assessment of the ESD content in an easy way if it included as an ESD annex to the thesis. Difficulties may arise to find enough supervisors having sufficient skills in ESD during an initial period. Initially an introductory training session in ESD must therefore be offered for most supervisors.

5.3. Comparison between the big and smaller package

The "big" package has the possibility of integrating all perspectives of sustainable development into the curriculum of the new, final course. Since this course is not included in the small package the total integration is not possible in the small package. The new course in the "big" package also offers the opportunity to promote the progression of students' communication skills, which is not as easy achievable in the small package. The "big" package accomplishes a higher level of common training in ESD to all students, not achieved in the "smaller" package. Without further investigation about the possibilities and limitations at different levels and in different specializations it is currently not possible to rank one of the packages as more possible to implement than the other.

5.4. Training of teachers

The integration of sustainable development is implemented into all parts of the entire teaching program is a major challenge. In many parts of the teacher training program there is lack of skilled teachers for an implementation. This means that the teachers on the program should take a course in how ESD can be integrated as a natural part of their teaching practice. In this way they will at least be familiar with the concept of sustainable
development, education for sustainable development and have been training how these ideas can connect to and be integrated into their own teaching. Based on the response from the students it is also clear that this kind of course should be offered to teachers already working in the schools.

The course for the teachers on the teacher training program should be offered opportunities to receive training in the meaning of sustainable development, most likely in the form of a series of seminars. Here, issues of a more substantive nature are included, but also illustrations of more ethical, historical and political natures: Besides seminars addressing the ecological, social and economic dimensions, seminars should also include issues such as the ideas that the most accepted interpretation of the ESD concept are based on. How have these ideas evolved? What political impact has sustainable development had? How is sustainable development addressed in an international context, e.g. within the UN, EU and World Bank? Undoubtedly the competence exists at the university to give such a seminar series since there are a number of teachers at the University of Gothenburg already conducting research on and teach these issues.

5.5. Seminars on the integration of sustainable development.
In the underlying surveys many comments were given regarding the possible problems to integrate sustainable development in courses that do not clearly address this issue. This was also raised in conversations with teachers at the University of Gothenburg. These observations are understandable and currently this question has no complete and universal answer. However, there are internationally and in Sweden growing research and experience that should be consulted to provide guidance in these matters. A fasttrack for the integration should therefore contain two parallel series of seminars to cover the conceptual training on what education for sustainable development is, and a seminar series that focuses on questions about how such integration can be achieved. The seminars should be organized in such a way that the examples and research results presented will also be followed by opportunities for the teachers to discuss how it can be applied to their own teaching. The latter is believed to be of a particular importance for a successful implementation of ESD. In many schools you can find new and inspiring examples of learning for a sustainable development. Attracting teachers and school leaders with successful examples to contribute as inspiring speakers and participate in seminar discussions should be encouraged.
6. Discussion and synthesis

The integration of Sustainable Development (SD) into the course work vary extensively in Swedish higher education despite the fact that the Swedish Higher Education Act (Swedish National Agency for Higher Education, 2009) Chapter 1, Section 5 declares that "In the Course of Their Operations, higher education institution Shall Promote Sustainable Development to Assure Gift for Future Generations and a Sound and Healthy Environment, Economics and Social Welfare, and Justice.". This formulation is open for a large variety of interpretations since it does not explicitly state that SD should be included in the actual course work. The University of Gothenburg is fairly advanced in terms of central objectives but when it comes to implementation, it is most likely not better than many other universities in Sweden.

There is a considerable variation even between and within programs at the university, for reasons mentioned above. At University of Gothenburg the Act has been interpreted as “Sustainable Development should be integrated into all first-cycle and study programs.” This is part of the policy of the university leaving very little room for any exceptions, but still the differences are large between and within the different programs at the university. In discussions among colleagues the differences should be seen as a manifestation of the academic freedom. Others believe that the lack of SD in some courses and programs should be seen as obstruction. If there are no legal or negative economic consequences, little will be changed over the years to come. The real impact of ESD will come when there are enough teachers and researchers that believe it is important and relatively easy to implement ESD in the courses, and also goes all the way to really implement it.

The University of Gothenburg has an ambitious follow-up tool for SD and Environmental integration in courses and programs, but it gives an uncertain result, as the departments differ how they interpret the meaning of SD and to what extent SD is actually integrated in their courses. A comparison with other universities in Sweden is impossible as most of them do not have tools for identifying SD integration factors. This tool, its implementation and impact is discussed in the article “Eco-labelling of courses/programs and training course for university teach” on this conference.

New programs for Teacher Training in Sweden will start in 2011. They will not offer better SD integration opportunities than today as there are still no central demands or offers to
stimulate such integration. It is up to the respective university to accommodate that – just as it is today. The ambition of the team responsible for the survey and the proposal for changes in ESD in the teacher training program is that this work can be the basis for a thorough and careful implementation of SD and ESD in the teacher training program. This ambition is backed up by the support of the Centre for Environment and Sustainability, GMV, University of Gothenburg and Chalmers University of Technology. The centre has a good reputation in its ability to act as a driving force in the implementation and follow-up of SD on both universities in Gothenburg. This can be utilized in the reforming process of the teacher training program at University of Gothenburg.


