

# Enabling action-oriented and transformative learning for sustainability in vocational teacher education. Example from The University of Gothenburg, Sweden.

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This paper presentation draws on data from an Educational Sustainable Development (ESD), module in the Vocational teacher education programme at the University of Gothenburg, Sweden. There are two different kinds of data: Firstly, 30 group work projects, where the assignment was to design an ESD activity in upper secondary vocational education. Secondly, web course evaluations with the vocational teacher education students that were carried out at the end of the course including this ESD module. In all, 160 vocational teacher education students have participated from December 2013 – June 2016. The average response of the course evaluation is 80%.

As argued by e.g. Hofman (2015) and Sterling (2009), the need to integrate sustainable development in higher education is strong, but a difficult process. The results of Hofman's studies give a picture of how ESD "requires integrative and interdisciplinary courses", and also the importance of developing of action-oriented competences among teacher education students. This paper can be regarded as a response to such a call and for this purpose the details of the ESD module are brought forward.

The ESD module presented here is part of the course "Development and action research for vocational teachers", a 7.5 higher education (ECTS) credits course, at the Department of Education and Special Education. 30% of this course has a focus on sustainable development and this specific educational unit is provided by researchers and teachers from the Department of Biological and Environmental Sciences. The purpose of this unit is aligned with the dimensions of ESD, put forth by UNESCO. The syllabus includes seven "intended learning outcomes", two of which relate to ESD, formulated as follows:

- Describe and critically examine the concept sustainable development and how the concept is used in society and school.
- Design and present an ESD activity, based on the vocational area.

The course content related to these two learning outcomes is described in the course syllabus in the following way:

"One topic in the course is sustainable development, a key concept in international policy and in different curricula in the Swedish school system. Sustainable development and education for sustainable development is studied as an example of a key theme in school development. Here, the student will both develop knowledge about sustainable development and about different methods for ESD."

In this paper, we first present the content and form of this course module and present the ESD activities that the students have designed. Secondly, the results of the web course evaluation are presented. Finally, we discuss how this course module enables action-oriented and transformative learning for sustainability in vocational teacher education, and what can be improved. Our research can be described as self-studies in teacher education and is placed in the framework of action research. A systematic investigation on our own educational practice has been carried out. As action researchers Reason and Bradbury argue (2001, 2008), action

research is not so much a methodology as an orientation to inquiry. Exploring one's own practice, is a matter of making way for professional development in different ways, "in order to invoke the conditions to genuinely enrich students" (Hardy & Römmerman 2011, p. 470) and in order to find ways of morally informed and committed action (Kemmis 2010).

Initially, however, some facts and context are provided about the Swedish vocational teacher education program and about vocational programs in Swedish upper secondary school.

## Facts and context

Sweden has a compulsory nine-year school and a unified and integrated upper secondary school system. This goes back to a decision in parliament in 1968 (Opper 1989; Lundahl et al 2010), and since the early 1990s, both vocational and academic upper secondary education have been organized as three-year programmes. There are eligibility requirements for both the vocational and academic programmes<sup>1</sup>. There are 12 vocational programmes:

The child and recreation programme	The building and construction programme	The energy and electrical engineering programme	The vehicle and transportation programme
The business and administration programme	The hotel and tourism programme	The industry programme	The natural resource use programme
The food and restaurant programme	The health care programme	The heating, water and sanitation programme	The handicraft programme

Many programmes have several orientations. The following is an example of the orientations in The handicraft programme:

The cabinetmaking orientation should give knowledge about and skills in manufacturing methods and handling tools and machinery, and also knowledge about materials used in the industry. The orientation can lead to work in the carpentry area.

The floristry orientation should give knowledge about and skills in combining different materials to create floral arrangements of technical and aesthetic quality, and also give knowledge about potted plants, cut flowers, and other types of materials used in the area. The orientation can lead to work as a florist.

The hairdressing orientation should give knowledge about and skills in different methods, techniques and handling of tools, and also knowledge about materials used in the area. The orientation can lead to work as a hairdresser.

The textile design orientation should give knowledge about and skills in the construction, manufacturing methods, and handling of tools and machines, and also knowledge about materials used in the handicraft area. The orientation can lead to work in the textile industry.<sup>2</sup>

<sup>1</sup> The term "academic programmes" is used here, although there are different English translations, e.g. the term "general education preparing for higher education".

<sup>2</sup> The text is from the publication *Upper secondary school* from the National Agency for Education: <http://www.skolverket.se/publikationer?id=2801>

Upper secondary education also provides so-called introductory programmes for students who do not meet the eligibility requirements for vocational or academic programmes. Vocational subjects are also provided within these introductory programmes. In all, 35% of the students in Swedish upper secondary schools attend a vocational programme. The ESD modules presented in this article have been developed by vocational teacher education students with students in mind who attend these upper secondary vocational programmes described above.

Swedish vocational teacher education is made up of a 90 ECTS credits programme: 60 credits of course-based studies and 30 credits of work-based training (practicum) in upper secondary schools or adult education. This can be arranged as full-time studies of one-and-a-half-year, or part-time studies. At the University of Gothenburg, the arrangement is a three-year part-time study programme, mostly distance-based with some on-campus meetings at the university. Most of the students (75%) already work as unqualified teachers in upper secondary education and in adult education.

As regulated by the Swedish National Agency for Higher Education, there are two requirements to be admitted into vocational teacher education: (1) a general university entrance requirement based on completed high-school studies with so-called core subjects, and (2) specific competency-based requirements for vocational knowledge and skills in subjects matching the upper-secondary vocational subjects in different areas. The 60 ECTS studies of vocational teacher education contain courses on general knowledge and skills that all teacher categories study called “a joint core of educational science”. As formulated in the English summary of the Inquiry on the new teacher education (SOU 2008:109, p. 26), these are the areas of the core of educational sciences:

- The organisation of education and its conditions, foundations of democracy
- Curriculum theory and didactics
- Theory of science, research methods and statistics
- Development and learning - Special needs education
- Social relations, conflict management and leadership
- Assessment and grading
- Evaluation and development work.

The contents of these areas are meant to be adapted to the specific teacher education programme. Thus, vocational teacher education students study these areas, but with literature, issues, tasks (etc.) based on their vocational program. This is in short the national framework for Swedish vocational teacher education, for the educating universities and colleges to match and build on, when designing the curriculum of their teacher education programmes. The Swedish higher education system is highly decentralized and how the course content is to be organized is for the local university or college to decide. In this way, university boards also formulate their specific priorities. The teacher education board at the University of Gothenburg has stated that ESD is a theme of priority for all teacher education programmes.

## The module and the instruction

The position of the course “Development and action research for vocational teachers” is in the later part of the vocational teacher training programme. The course starts with one day on campus, and ends with one day on campus. The rest is carried out as distance studies. The course has five assignments, all of which are introduced at the first campus day of the course. The ESD module with its two assignments is the last in the course (*i.e.* Assignment 5, below). The approximate time for the module is three weeks, part time (50% studies). The student work is carried out via a digital Learning Platform and via Adobe Connect, and the presentations take place at the final campus day of the course. The instruction for the

assignment is as follows (The text is directly translated from the course guide, which is in Swedish)

***Assignments:***

This definition of sustainable development by the Brundtland Report is the most frequently used: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Three main *interrelated* pillars are identified:

- environmental protection
- social equality
- economic growth

This definition and other key aspects of sustainable development will be discussed in the lecture on campus the first day of the course, during the introduction to assignment 5.

Sustainable development is interpreted differently in media, on the web, in the course literature and in other books. During the first day of campus, you will be given reading instructions. The course literature is a foundation for you and your project group to be able to take a stand on how education for sustainable development (ESD) can be carried out in vocational education. On the Learning Platform, you will also find links and documents on ESD.

Assignment 5 consists of two parts, 5a and 5b. Assignment 5a is the major part and is carried out as a group project. The task is to design an ESD activity that can be carried out in a vocational education programme. Assignment 5b is a short personal reflection text, based on the course literature and the content of your group work.

***Assignment 5a:***

Plan an ESD activity that can be used in upper secondary vocational education. Examine how sustainable development and environmental issues are part of the curricula and other policy documents of the programme, and other important documents, such as job descriptions, scope of work, etc. You will find links for inspiration on the Learning Platform.

The form of your ESD activity is optional. For example, you can make a film, a slideshow, a Prezi, a poster, a flyer, a play, or a course material concept. You are completely free to choose the form for your ESD activity. The only limitation is your imagination! You don't need to have a completed activity at the presentation of the ESD activity, but you need to describe a plan in accordance with the questions below:

What is the content of the ESD activity?

Which are the goals/the intended learning outcomes for the ESD activity?

Which perspectives are in focus?

How can you enable "the three pillars" to be part the content of the activity?

How can the activity be connected to syllabi?

What do you see as the challenge of the activity?

What is the potential for further development of the activity'?

**Check:** A short proposal outlining content and form is uploaded on the Learning Platform latest May 17. On May 24, a short 'status report' is uploaded, with possible questions to your teacher. Your teacher will give feedback latest May 26.

**Oral presentation/examination:** May 31, the presentation is upload on the Learning Platform. Also, bring a USB to the oral presentation. The presentations take place on June 1, 12.30-16.00. During the morning of this campus day, you are able to meet and prepare your presentation together.

**Degree:** Pass or fail.

**Feedback:** From your teacher during the check and from your teacher and peer students during the group's oral presentation. The teacher will also provide written feedback to each group after the seminar, latest June 16. After this, the groups who want to make possible revisions of the final product can do this, and after this the presentation can be uploaded at <http://libguides.ub.gu.se/projektarbeten>

We want you, your schools and others to be able to make use of in the ESD activity plans produced by you. We hope to be able to build up a web archive of such important ESD material for others in vocational education to utilize.

**Assignment 5b:**

Write a personal reflection in two parts:

- Half a page where you reflect upon the sustainability of the ESD activity of your group. Relate to the definition of the Brundtland report.
- Half a page where you give your reflections on how the students will receive or react to the ESD activity.

**Degree:** Pass or fail.

**Deadline:** Upload your document on the Learning Platform. Give it your name and 5b.

**Feedback:** From your teacher in the Learning Platform assessment tool, latest June 16.

## The 30 ESD activities: themes/content

Thirty group projects with the planning and design of an ESD activity have been presented on campus, using Power-point, Prezi, etc. These have been categorized here and the headings have been translated to English. Two basic types of activity were developed: ESD cross-vocational activities (11) and ESD activities connected to a specific vocational area (19).

<p><b>Content specific to a vocational area:</b></p> <ul style="list-style-type: none"> <li>• <i>Eco-driving</i>. An ESD activity for the subject Transport (The vehicle and transportation programme)</li> <li>• Recycling. A module in The vehicle and transportation programme.</li> <li>• Environmental awareness in transportation. (The vehicle and transportation programme)</li> <li>• Sustainable development in the building and construction sector. (The building and construction programme)</li> <li>• The sustainability of bricks. Environmental issues in construction. (The building and construction programme)</li> <li>• Sustainable development and tendering. (The industry programme)</li> <li>• Recycling. A module in The energy and electrical engineering programme.</li> <li>• Energy consumption. The natural resource use programme.)</li> <li>• Grocery shopping service for seniors. (The food and restaurant programme)</li> <li>• Taking an ethical and an environmental stance. (The food and restaurant programme)</li> <li>• Sustainable development for hairdressers. (The Handicraft programme, orientation Hairdressing)</li> <li>• Sustainable development in the field of hairdressing. (The Handicraft programme, orientation Hairdressing).</li> <li>• Products in the hairdressing vocation – from the perspective of sustainable development. (The Handicraft programme, orientation Hairdressing).</li> <li>• Sustainable development in the Handicraft programme, orientation textile.</li> <li>• Sustainable development in trade. (The business and administration programme)</li> <li>• Furnishing and decorating a hotel room. (The hotel and tourism programme)</li> <li>• Climate smart food in an elderly care center. (The health care programme.)</li> <li>• Food, health and environmental influence. A project in The health care programme.</li> <li>• Health pedagogy and sustainable development. (The health care programme).</li> </ul>	<p><b>Cross-vocational activities:</b></p> <ul style="list-style-type: none"> <li>• Theme day: Are you climate smart?</li> <li>• Role-play on sustainable development for students in vocational education.</li> <li>• Eco Bazaar. A teamwork for three vocational programmes.</li> <li>• Theme work for vocational programmes on biological diversity. The case of palm oil.</li> <li>• Theme work on health and sustainable development. For students in the Health care programme and the Child and recreation programme</li> <li>• The time machine. An ESD game for students in upper secondary school.</li> <li>• <i>So much better</i>. An ESD theme work for students in upper secondary education.</li> <li>• An ESD project for students in The energy and electrical engineering programme, The vehicle and transportation programme and The building and construction programme.</li> <li>• A theme day on sustainable development in the upper secondary school "Somewhere-in-the-country".</li> <li>• Organising a sustainable upper secondary examination party. A collaboration between students in The business and administration programme and in The food and restaurant programme.</li> <li>• Ethical and environmental trade. For students in different programmes in upper secondary education.</li> </ul>
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As the headings show, the themes of the planned ESD activities cover a range of perspectives and areas. Next, two examples are presented.

## Example 1: Organising a sustainable graduation party



A collaboration between students in The business and administration and in The food and restaurant programme.

**The content and form:** A three-day case. The students in The business and administration programme and in The food and restaurant programme (year two) receive an order to arrange the upper secondary schools' party for the students that graduate (year three).

Lectures and films of the three pillars and on fair trade etc. is mixed with group work. The activity ends with presentations by the students.

**The goals/learning outcomes:** The aim of the teachers is to provide the students with an understanding on how choices affect people and the environment, and to develop the students' awareness of sustainable development. The students shall present a plan for the party, based on sustainable development

**Perspectives in focus:** "The school should develop the social and communicative competences of students, and also their awareness of health, life style and consumer issues." (Fundamental values/curriculum).

### **The three pillars:**

- **Environmental:** Transport, farming, country of origin, cycling
- **Economical:** Transport, marketing, site of production
- **Social:** Conditions of production, cycling, eco-labelling

**Connection to curriculum/syllabi:** To the overarching goals in the curriculum, to the syllabus of the following subjects: Entrepreneurship, Sales and customer service, Food and nutrition

### **Challenges:**

- The students are from different programmes.
- Each student has different knowledge of the themes/issues.

- Source criticism
- How shall the students be assessed, in group/individually?
- Feedback
- The time limit
- It is more difficult to find information about social SD, than of the other two pillars.

**Potential development:**

- All students can join a project like this
- It can be expanded and involve other programmes
- The project can be divided into slots

**Example 2:** Eco-driving. An ESD activity for the subject Transport (The vehicle and transportation programme)



**The content:** A task in the subject Transport, in the Vehicle and transport programme.

**The goals/learning outcomes:** “Students should develop knowledge about and skills in choosing the right equipment and methods for carrying out tasks with regard to the environment, quality, safety and finance.”

“Students should develop the ability to carry out different tasks based on the requirements of sustainable development.”

**Perspectives in focus?** Safe driving- conscious driving.

**The three pillars:**

- **Environmental:** Renewable fuels, climate issues
- **Economical:** Fuel saving, smooth driving maintenance, servicing, streamlining, etc : ecodriving
- **Social:** Safe driving, awareness of others.

**Connection to curriculum/syllabi:** To the overarching goals in the curriculum, to the syllabus of the subject Transport.

**Challenges:**

- That all students shall reach these goals.
- The time/economy to create a learning unit

**Potential development**

- There is much focus on sustainable development in society



- Ecodriving is a skill that improves employability as professional driver

## Conclusions about the ESD themes

As the list of the themes and the two examples provided here show, the ESD activities that the vocational teacher education students have designed cover quite different areas of vocational education, and have different perspectives and focus. The presentations all convey how ESD can be connected to and supported by syllabus and curriculum, and they give concrete examples of methods for teaching and learning ESD. We now turn to the data we have from student evaluations of the course.

## The results of the course evaluation questionnaire

As mentioned earlier, the course is given twice a year. At the end of the course, the students fill in a web questionnaire. The presented data below were generated on six occasions. On average, 79.8 % of the students have filled in the questionnaire (range 56-94%). Two questions address the ECD module. These are represented as A and B in the table columns. Question A: To what degree have you achieved the course goal to “Carry out a project in sustainable development related to your own vocational field”? Question B: To what degree has your work with and the examination of the ESD project provided a learning experience for you?

The results show the percent of students that were very satisfied (answered 4 or 5), (questionnaire: scale 1-5, of which 5 is the best possible).

<b>Semester:</b>	<b>A</b>	<b>B</b>
Fall 2013	66 %	50 %
Spring 2014	69 %	84 %
Fall 2014	96 %	88 %
Spring 2015	100 %	76 %
Fall 2015	88 %	71 %
Spring 2016	89 %	75 %
<b>Average:</b>	<b>85 %</b>	<b>74 %</b>

These results can be compared with the results of two other questions in the questionnaire of this course, represented as C and D in the table below. It can also be compared with the result of E, covering a comprehensive aspect of the course.

**C:** To what degree have you achieved the course goal to “describe some theories and perspectives on school development”?

**D:** To what degree have you achieved the course goal to “design and present a plan for a school development project with an action research questions and with suggested methods for

collecting data?

**E:** Has the course as a whole been relevant to the teaching profession? (Scale 1-4, of which 4 is the best possible: 4: as a whole very relevant, 3: most parts relevant.).

Semester:	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Fall 2013	66 %	50 %	75 %	75 %	84 %
Spring 2014	69 %	84 %	84 %	74 %	84 %
Fall 2014	96 %	88 %	100 %	92 %	100 %
Spring 2015	100 %	76 %	100 %	100 %	94 %
Fall 2015	88 %	71 %	77 %	78 %	100 %
Spring 2016	89 %	75 %	83 %	84 %	94 %
Average:	<b>85 %</b>	<b>74 %</b>	<b>86 %</b>	<b>84 %</b>	<b>93%</b>

The results from the questionnaire show that overall, the students are positive to the content of the ESD module and the work that is carried out within this part of the course. The questionnaire also has the possibility for complementary textual answers, and these also confirm the picture that the content of ESD and the module is appreciated, with comments such as:

“Initially, I did not see what sustainable development had to do with school improvement and the rest of the course, but I have changed my mind” ...

“A subject that was much more interesting than I thought” ...

“I think it is great that you have this in our programme, many people including fellow students are so ignorant about these issues”

As shown by the table, the answers of the question “To what degree has your work with and the examination of the ESD project provided a learning experience for you?” (i.e. question B) show a potential for pedagogical improvement. We will return to this in the final discussion.

## Final discussion

The research presented in this paper can be described as self-studies and is placed in the framework of action research. We have conducted a systematic investigation on the content and form of an ESD module in a course where we teach in vocational teacher education. The results of the questionnaire show that overall the students express positive experiences. Here, we bring forth some conclusion of these positive results.

Firstly, we think that the interdisciplinary construction of the course is a necessity, with engaged lecturers and teachers from the Department of Biological and Environmental Sciences. ESD is a complex and particular topic, and in our view the learning of ESD in higher education studies requires teachers with specialized content knowledge. Secondly, we

think that the form of the module, where the students work in groups with the task to design and present an ESD activity that actually can be used and applied by teachers in upper secondary vocational programmes, provides a meaningful and authentic pedagogical challenge. Thirdly, we think that the construction of the task where the students choose the theme and the form of presentation, but need to connect to specific questions<sup>3</sup> provides a balanced framing and enables inquiry-based and action-oriented learning. These students all have vocational knowledge and experiences from their specific vocational fields. They are often well acquainted with issues of sustainability and recycling in their own field, before they read the course literature and start working on the task of the ESD module.

As the groups present their work for the other vocational teacher education students in class, and power-points/other kinds of presentations are accessible on the web, our view is that this module enables an action-oriented ESD pedagogy, allowing for the vision of transformative learning, as put forth by UNESCO. Yet, the answer to the question “To what degree has your work with and the examination of the ESD project provided a learning experience for you?” in the student evaluations presented above, tend to show slightly lower results than the other questions. The question has been formulated this way, based on an idea that the students get examples and are provided learning experiences during the examining presentations. However, some of the comments in the textual answers show that students are nervous about their own presentations, and do not have the capacity to accommodate the presentation of others, or are tired after their own presentations. In our critical reflection, we see a need to change this question, it does not serve a relevant purpose. We also see a potential for addressing the idea of transformative learning stronger. This could e.g. be scaffolded by short films, inspired by the pedagogy of flipped classroom, where the transformational ethos is discussed by us teachers involved in the course.

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<sup>3</sup> What is the content of the ESD activity? Which are the goals/the intended learning outcomes for the ESD activity? Which perspectives are in focus? How can you enable “the three pillars” to be part the content of the activity? How can the activity be connected to syllabi? What do you see as the challenge of the activity? What is the potential for further development of the activity’?

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