Implementation of Education for Sustainable Development in Universities of Applied Sciences

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Abstract

Universities of Applied Sciences have emerged from the former German "Ingenieurschule" and "Fachhochschule" and from this tradition they have a strong focus on engineering and industrial application. This poses a particular challenge on the implementation process for Education for Sustainable Development (ESD) at these universities. We look at these implementation processes from a managerial and organisational point of view. We have a twofold focus:

- The processes and methods to implement ESD at a university
- The pedagogical methods for ESD

The basis for all activities is a sustainability portfolio, which combines sustainable development (SD) in education, research, operation and transfer (EROT) with a holistic approach of SD. Working on the implementation process for ten years conducting action research, various methods have emerged like the prepared projects method for students' projects on sustainability or the development and use of educational games.

Keywords

Education · Sustainable development · Project method · Research education

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1   Introduction

Education for Sustainable Development has been identified by the UN as the most important measures to reach Sustainable Development (SD), since it "allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future" (UNESCO 2014). In the basic Brundtland-Report, SD is defined as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987).

The UNESCO defines Education for Sustainable Development in the following way: "Education for Sustainable Development means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way" (UNESCO 2014).

The competences that are needed for shaping a sustainable future can be summarized by the term "Gestaltungskompetenz" (shaping competence), that has been coined by de Haan (2008). Throughout the years, there have been a lot of definitions, listing between eight and twelve elements of shaping competence. Holzbaur et al. (2013) identified five core areas of shaping competence:

- ethics: competency to deal with own and other people's and group's values
- knowledge: competency to acquire and integrate new knowledge
- planning: competency to plan
- action: competency to implement plans and to participate in decision processes
- reflection: competency to analyse and reflect processes.

The precondition for ESD is responsibility. Thus universities need to dispute with this topic and their own specific responsibility too. Leal Filho (2015) points out that especially higher education institutions are playing a key role in making a major contribution to a sustainable development. Due to their "formidable body of knowledge and expertise", higher education institutions "are uniquely placed to help society to identify and implement the social and technical solutions to the environmental challenges they have helped to identify" (Leal Filho 2015, p. 5). Subsequently he identifies three main approaches of implementing sustainability in higher education institutions: an individual one, a sectorial one and an institutional one. Nevertheless there are many problems that are preventing universities from the implementation processes, like a lack of strategic goals or a reduced willingness to promote structural changes (Leal Filho 2015). These problems need to be identified and solved, since an implementation of sustainable development is unavoidable.

Our contribution to the fostering of these implementation processes, especially at Universities of Applied Sciences (UoAS) is given from an organisational point of view.

The focus is on two aspects. At first we describe general processes to implement SD at a university, like the compilation of a sustainability portfolio (Chap. "Looking Beyond Fossil Fuel Divestment: Combating Climate Change in Higher Education"). Second we present successful pedagogical methods to foster ESD, like project learning and simulation games (Chap. "Beyond Recycling: Developing "Deep" Sustainability Competence"). The processes and methods presented are easily replicable for other universities.

2 General Remarks on Implementing SD at Universities

2.1 Universities of Applied Sciences

Universities of Applied Sciences have the triple mission of education, research and transfer. These Universities of Applied Sciences (UoAS) have emerged from the former German "Ingenieurschule" and "Fachhochschule" and from this tradition they have a strong focus on engineering and industrial application. This poses a particular challenge on the implementation process for sustainable development at these universities. Research is strongly focussed on applications which in fact supports transdisciplinary research. Moreover, their research focus is strongly influenced by third party funding.

2.2 Universities and Responsibility

A contribution to sustainable development requires the awareness and acceptance of responsibility. Fortunately it can be seen, that universities are getting more and more aware of their responsibility. At first they have responsibility to the students, who are the decision makers of tomorrow and thus shaping future' society. This results second in responsibility towards society. Third especially UoAS have responsibility to the industries, which need qualified employees. And fourth, a university needs to be responsible in their management of funds, which they receive by the government.

We start with short overview on responsibility and sustainability. Responsibility refers to the consequences of human action. One can only be responsible for the things that depend on him or that can be influenced by himself (Zimmerli 2014, p. 21). Being responsible does have three dimensions minimum: *Someone* (subject of responsibility) is responsible *for* somebody/something (object of responsibility) *towards* someone/institution (instance of responsibility) (Zimmerli 2014, p. 22).

The philosopher Hans Jonas was one of the first, who pointed out the correlation of technical progress and the concomitant growing responsibility.

The basic thesis of his work "The Imperative of Responsibility" is that the promise of latest technology, like genetic manipulation, has turned into a threat, due to unpredictable consequences of action. In addition in many cases it is very hard to tell, which person is responsible for undesirable outcomes of action, like global warming or the loss of biodiversity. For that reason Jonas recommends an "Ethic of Responsibility" and an orientation along impending threat instead of possible promises. The uncertainty needs to be integrated into the ethical theory. "It is the rule, stated primitively, that the prophecy of doom is to be given greater heed than the prophecy of bliss" (Jonas 1984, p. 31). In addition inspired by Immanuel Kant, Jonas formulates a categorical imperative for responsible action: "Act so that the effects of your action are compatible with the permanence of genuine human life" […] "Do not compromise the conditions for an indefinite continuation of humanity on earth" (Jonas 1984, p. 11).

Thirty years later Vogt defines responsibility as a basic willingness to account for one's own action (Vogt 2009, p. 384). Shouldering responsibility is an act of freedom. Man can choose between several options for action, provided that he considers himself being free and not determined. As a consequence accountability can be demanded, especially if the chosen action has negative consequences for third parties. The challenge of the 21st century is that due to an increase of new technologies and the thereby increased options of action, the attribution of individual responsibility is not possible anymore. Since it is unclear who or which (technical) invention caused a specific unwanted consequence like global warming, it is not possible to hold the causer liable. Nowadays one needs to accept responsibility for consequences that have not been caused by him (alone) (Zimmerli 2014, p. 23).

Therefore it is essential to overthink the borders of technical progress. Just that things can be done, does not mean that they should be done, since they might not be good for society. In this context Jonas Imperative is very useful, when trying to find the "responsible" border of technical progress.

Due to these unpredictable effects of technical achievements engineers are highly responsible for common welfare (Hieber 2014, p. 11). It is important that right from the beginning of the developing process of technical inventions possible applications, risks and consequences are discussed—like the example of nuclear fission has shown impressively. For this reason, higher education institutions, who qualify future engineers, are asked to train future engineers not only with expertise but with "estimation competence" and competence to assume responsibility. The estimation of possible consequences of action is essential for shouldering responsibility and definitely challenging. This "estimation-competence" requires networked thinking to understand complex global relationships. Measuring instruments like the Ecological Footprint that accounts "whether the planet is large enough to keep up the demands of humanity" (Global Footprint Network 2003–2015). Can help to identify some of these unwanted consequences. "The Ecological Footprint represents the productive area required to provide the renewable resources humanity is using and to absorb its waste" (Global Footprint Network 2003–2015).

Table 1 Stakeholders of a university and main requirements

Stakeholders	Demands
Students	Education
Society	Social responsibility/transdisciplinarity
Economy	Development/training
Scientific community	Science/research

Universities that want to assume responsibility need to consider the main requirements of all stakeholders. Thus the responsible university is also a responsive one. Lategan and Holzbaur (2010) have developed a model for a responsible university, that responds to the claims of the various stakeholders. The stakeholders are represented in the supervising body of the university and hence deciding about the university strategy. Every stakeholder of the university has his own requirements and demands. The responsible university responds to the needs of all relevant stakeholders, as long as their demands are legitimate. The difficulty is to balance, which needs are essential ones and which are not. Table 1 presents the demands of the four most relevant university stakeholders.

2.3 The Baden-Württemberg Way: Network of Universities for SD

For a better understanding of the implementation process, the special environment in Baden-Württemberg is outlined.

In Baden-Württemberg, a Center for the Enhancement of Ethics in Science and Engineering (rtwe—Referat für Technik—und Wissenschaftsethik) was established in 1991 as a central service unit for all Universities of Applied Sciences (UoAS) in Baden-Württemberg. The rtwe was established to support UoAS in implementing science and technology ethics and technology assessment in their teaching, research, projects and curricula. Most of the 21 UoAS have implemented the position of a senates delegate for science and technology ethics who is responsible for implementing the program at his university and is also part of the Baden-Württemberg network for Ethics in Science and Engineering meeting twice a year in one of the participating universities and organizing seminars and workshops.

From the early days, there was a strong focus on the application of ethics and on environmental issues leading to a strong interest in all aspects of sustainable development. Based on these activities, the Baden-Württemberg Network of Universities for Sustainable Development (HNE = Hochschulen für Nachhaltige Entwicklung) evolved and was formally established in 2005. It is managed by the rtwe and has a similar structure with senate's delegates for Sustainable Development as representatives of their university, with regular meetings and workshops. Several universities have also established positions for a coordinator for sustainable

development who is planning and implementing education for sustainable development at his/her university.

The HNE is an open network with intensive communication via email lists and with more than 200 members in 21 UoAS. From this network, a Federal network evolved which allows professors from other universities all over Germany to participate in the network activities. The HNE is also part (as an organization and via several shared memberships) of the Baden-Württemberg network for Education in Sustainable Development (BNE = Bildung für Nachhaltige Entwicklung) focusing on teacher´s education in ESD but also considering question of methods and curricula for implementing ESD in all areas of education.

HNE and several of its members have been rewarded several times as a project of the UN Decade Education for Sustainable Development 2005–2014.

3 Implementing ESD at UoAS

3.1 Stepwise

Especially at universities with a technical focus, it is helpful to use technical topics, like energy and resource saving as an entry point for the implementation of SD. Later on it is essential to communicate, that SD is much more than that and indispensable for our future. To foster a systematic implementation process it is useful to compile a sustainability portfolio for the university. This portfolio visualizes the SD aims and strategies in the four fields of action education, research, operation and transfer. Table 2 summarizes the use of the sustainability portfolio.

In the preparation of the first sustainability report of the university, seven interviews with members of the university outlined the focus and importance of their activities:

Table 2 Use of the sustainability portfolio

Target group	Use
Sustainability team	Strategic plan, focus
University top management	Communicate the strategy
Faculty/department management	Plan their role within the portfolio
University top management	Communicate the strategy
Research focus: professors and staff	Stepwise approach communicate the role of individual research
Educational focus: professors and staff	Stepwise approach communicate the role of subjects and lectures
Public	Stepwise approach communicate the role of individual research
City administration	Focus for cooperation

- Three professors within the study course "industrial Management" have outlined their activities in education including sustainable development, leadership and sustainable management,
- Three researchers have outlined their activities including renewable energy, materials science and sustainable event management.
- The manager of the career centre, outlined the extracurricular activities to support the social skills and competences of the students.

3.2 Portfolio for the Implementation of Sustainable Development

The implementation of sustainable development at a University of Applied Sciences needs a structured approach. This paper presents two portfolios: Table 2 shows the one of Aalen University (HS Aalen) and Table 3 the one of the cooperation partner Central University of Technology (CUT) Bloemfontein, South Africa. For more than ten years CUT and HTW Aalen cooperate to implement education for sustainable development in both universities.

3.2.1 HS Aalen

The areas of activity of a university can be divided into education, research, transfer and operation. The following portfolio (Table 3) visualizes these areas differentiated according to the dimensions of sustainable development—ecology, economy and social issues—and an overall view for cross-cutting issues.

Table 3 Portfolio of sustainable development at the university of applied sciences Aalen 2014

	Education		Research	Transfer	Operation
Holistic	Integration of SD into teaching	Extra-curricular studies	(E) SD as a research topic	Real world lab Aalen	Governance framework conditions and organisation
Economic	Courses		Institute for applied research (IAF): Projects	"Explorhino" (workshop for young scientists) career-centre	Transparent and future-oriented management
Ecological				Company network transfer centres of the Steinbeis Foundation	Environmental management
Social					Future orientation for members of the university

Table 4 Portfolio of sustainable development at the CUT 2010

	Overall holistic intergenerational	Environment resources	Economics management	Social political intragenerational
Site level campus	Sustainability@CUT	Green campus	Economic sustainability	Blue campus
Local/regional community development	Cooperation programs	Climate protection program	Entrepreneurship sustainable economy	Community engagement
Regional/national education cooperation	ESD in curricula	Energy engineering for sustainability	Entrepreneurship	ESD in teachers education
National/global research cooperation	Cooperation programs SD in research	Energy water	Corporate social responsibility	Research in socioeconomic aspects of sustainability

3.2.2 CUT Bloemfontein

The aim of the project "Sustainability@CUT", which started in February 2011 is the implementation of SD into education, research, operation (campus), transfer and community development, leading to an autonomous sustainability management system. The HTW Aalen is supporting the project by an exchange of teaching staff, cooperation in management and students' projects as well as exchange students. Table 4 presents the SD portfolio of the CUT Bloemfontein.

4   Educational Methods

In the process of implementing ESD, we found it difficult to give the students the relevant competences for SD only by traditional lecturing. From this and from the need to influence society, we developed, adapted and tested several methods for teaching and learning.

4.1   Projects as Part of the Real World Lab Aalen/Students Projects/Project Learning

The transition to sustainable development is a challenging task for states, organizations and individuals. The "great transformation to sustainability" (WBGU 2011) will require the contribution of all groups in society. Science and consequently universities can make their contribution by expanding transdisciplinary research. This is the reason why universities are getting more and more engaged in the "real world lab".

Real world labs are places of transdisciplinary research, where social challenges and transdisciplinary research are connected (MWFK 2013). Real social contexts like cities, neighbourhoods or industries and issues like the strategy of sufficiency or

efficiency are supported scientifically to foster a transformation process. Basically a real world lab is initiating changes towards a sustainable development supported by science. These changing processes can be observed in the lab to achieve a better understanding of its causes and consequences. This is a new conjunction of research and transfer of knowledge in a network of science, economy and civil society for the implementation of a sustainable development (MWFK 2013).

Aalen University has a longstanding cooperation with the City Administration and with the Aalen Local Agenda 21 group of which was founded due to an initiative by the University, the City Dept. of Environment, and the Adult Education Centre. During 15 years, cooperation has grown and had a lot results beneficiary for the University and the City (Holzbaur and Kaufmann 2011). Thus Aalen has been a "real world lab" for sustainable development for more than 10 years. Schneidewind has emphasized the importance of "real world labs" for transdisciplinary research projects. According to him especially cities are an important space for experiments (Schneidewind 2013, p. 85). Lately Schneidewind (2014) shaped the term "True University Sustainability" referring to the "True Business Sustainability", speaking up for the necessity of universities to become transformative. Transformative research and teaching is the next step towards a true sustainable university, since transformative science requires an "outside-in-perspective", from the society (outside) to the university (inside), concerning two aspects (Schneidewind 2014). First the Grand Challenges of Society should be the topic of investigation and second social players should be involved in the development of research issues (Schneidewind 2014).

Education for sustainable development is one example of a real world lab. It is a highly topical challenge to convince society to engage for a sustainable development. This concerns all generations, disciplines, and industries anywhere and anytime. Thereby not only practical problems are emerging, but topics for research as well:

- How can these processes be influenced?
- Which methods are necessary to influence these processes?
- How to increase essential motivation for the implementation of sustainable development?

To answer these questions, it is important, that all participating actors come together, develop concepts and experiment with them. This example shows how real world labs serve as test rooms for transformation.

4.1.1 Project Learning

Project learning is more than just doing a project in the course of or instead of some lecture. Project learning needs to be planned in two aspects:

- Project success with regard to the project outcome of the students' project
- Learning outcome as a result of the didactical project including preparation and evaluation.

A more concise description that also introduces the two project triangles of students' project and learning project is given in (Holzbaur et al. 2013).

Projects are separately identified tasks that are handled by a dedicated team within a well-defined time and with limited resources. In brief: projects are anything that is non-routine. Projects are mostly seen as a means of achieving some goals. In education and training they can also be used to acquire knowledge and skills in an action oriented setting. To apply projects successfully, there must be a good preparation and a balance between theory and practice.

General competences gained via projects comprise the competence to:

- Plan in a result-oriented way considering the requirements with respect to quality, resources and timelines and their interactions.
- Structure the aims and the tasks to be accomplished in order to achieve these aims and to organize the work.
- Argue and preview argumentations and counter-argumentation in advance making sure that the result can be argued in a written documentation and defended in an oral presentation.
- Document the results and processes leading to these results.

Inquiry based learning is similar to PPM, but concentrates more on the increase of knowledge than on real world project outcomes and effects.

The systematic implementation of students' projects as a method of learning and communicating sustainable development and to contribute to regional sustainable development has been implemented in several projects of the ESD decade. The Baden-Württemberg state department within the framework of their program "welcome to science" has funded a project for systematically involving first semester students into projects. The method has been further developed at Aalen University and is implemented within the ESPRESSO team to support educators and students. ESPRESSO stands for "Experience science and practical relevance and learn sustainably via sustainability projects".

This is an example for transdisciplinary research in a real world lab (Schnei-dewind 2013) and also contributes to (education for) sustainable development outside the university.

4.1.2 Projects for ESD

After explaining the use of project learning, short summaries of several examples of students' projects that integrate learning for ESD and impact on society are given here.

Green Eel

The "Green Eel" is an environmental management system for schools developed by the Aalen Local Agenda 21 and Aalen University. It is based on two pillars: (1) environmental management without many formalities but high quality due to peer audits; (2) Environmental pedagogics and environmental protection. This makes the implementation of the environmental management system "green eel" very comfortable and easy. The certificate is awarded, if certain measures are performed and an environmental statement about the single activities, projects,

consumptions and targets is created. Students of Aalen University are supporting participating schools with the implementation of the green eel. They are helping with the actual condition analysis, the introduction into the environmental management system and the creation of the environmental statement. Employees of the Green Spaces and Environmental Office as well as the Agenda Office are available for technical information.

Beside Primary and General Secondary School, institutions of the youth, a gymnasium and a day care centre for children have been distinguished. By now a neighbouring municipality is in the process of adapting the system for a primary school; moreover two secondary schools are interested too. In addition multilingual information flyers have been made to improve the attraction and integration of migrants.

The "green eel" has been distinguished for five times by the UNESCO commission, being project of the UN-decade "education for sustainable development".

KARN

KARN is a virtual sustainability learning trail that runs along the rivers **K**ocher, **A**al, **R**ombach and **N**esselbach. Surrounding this path, several students' projects in cooperation with different organizations around Aalen have been performed. In addition schools of Aalen have undertaken sponsorships for single parts of the trail. Students' projects consider aspects of sustainability, communication and the use of social media, smartphones and other modern devices. The KARN projects also comprise tasks to make the train barrier free and useable by senior people. Also the documentation of wheelchair accessibility and of industrial history was components within the last years.

Experiencing sustainability and enjoying the Aalen region by museums and play and adventure areas near the trail is the aim of the KARN project.

Sustainability at HTW Aalen

Several students' projects improved sustainability at HTW Aalen. For example:

- sustainability aspects of university's open day
- Accessible University
- Green Campus
- Energy saving and student's behaviour
- Public transportation

4.2 Simulation Game

4.2.1 Educational Games and ESD

Educational game, business game, planning game, simulation game—there are several terms for an innovative method and several definitions of their meaning. According to the International Simulation and Gaming Association ISAGA in this

paper the term "gaming simulation" is used, because of its broad understanding of experience-based and playful education methods (ISAGA 2015). A simulation game provides a fictive situation, which is a simplified indication of reality (Ulrich 2003, p. 3). The various options gaming simulation have four different methods in common:

- **simulation**: a dynamic and simplified imitation of real processes, e.g. flight simulator
- **game**: an activity that is based on the pleasure of doing it and the rules of the game
- **role-play**: actors overtake foreign roles and experience different situations from a different point of view
- **case-study**: the learners are confronted with a concrete situation and certain questions that require specific solutions (Ulrich 2003, p. 3).

All these methods have in common that they are simulating processes for a better understanding of real complex processes (Kriz and Nöbauer 2006, p. 81). Thus gaming simulation method is a "language" for a better understanding of complex dynamics and processes (Kriz and Nöbauer 2006, p. 80).

Klabbers (1989) on the importance of Gaming Simulation:

"We are living in a world that is rapidly growing more and more complex. Consequently we find ourselves in the position of having to cope with problems that pass our comprehension. […] governments, institutions and corporations are becoming less competent in dealing with complex problems and in coping with high levels of uncertainty. […] gaming and simulation have proved to be a powerful combination of methods and ideas in dealing with complex and unique issues and with value conflicts between various parties (stakeholders). Gaming-simulation provides […] a shared language for communication between the social and natural sciences. With the utilization of gaming-simulation […] we can learn to converge on solutions through shared knowledge and a will to understand and act" (Klabbers 1989, pp. 3–4).

Especially in the context of business and socioeconomic development, simulation games are very common. They can also make an important contribution to ESD (Ulrich 2003).

4.2.2 Educational Game VAL-U

This is a short overview taken from the papers (Holzbaur 2001, 2003) and (Van den Berg et al. 2009).

In many discussions within the last years, the need showed up for a basic training in economics skills. Entrepreneurs and intrapreneurs, small scale farmers and shopkeepers wholesalers as well as craftsmen and traders need basic knowledge in accounting. The same holds for young academics: no one should graduate without elementary knowledge about the function of an enterprise and entrepreneurship. Entrepreneurship is the attitude to start an enterprise and to take well-calculated economic risks. Entrepreneurship is based on the will to take

decisions and to act. The entrepreneur is acting within an economy and investing his time and money to achieve an economic goal. Management is an important aspect for entrepreneurship. But it is not the business administration approach to organize and control a company; it is the will and ability of achieving results and contributing to economics success. Although starting an enterprise may be a one-man-show, a successful entrepreneur needs to involve other people—customers, employees, and partners. Innovators must involve their working groups as well as their peers.

Starting from a 2002 discussion in a community developments project of CUT, the idea of the planning game emerged. Also the conception of the game was based on the concept of "real world lab". It was implemented via several students' projects. The students cooperate in several development phases with several groups of society. After the conception of the game the students organized workshops using the games and reflect the results.

The cooperation with the management faculty on the aspect of using planning games to foster entrepreneurship and contribute to socioeconomic development has led to the project "Success in Small Business". The aim of this project is the conceptualization of the Planning Game "VAL-U" (VALues & yoU).

The development of the educational game system VAL-U is a joint effort of HTW Aalen and CUT Bloemfontein. It is based on several educational games and shall involve various stakeholders from university, industry, community, and education. The game will have several levels based on corresponding concepts of values:

1. The concept of value creation
2. Adding monetary value
3. Creating value for the market and fulfilling needs
4. Valuing people and culture
5. Entrepreneurial values and Sustainable Development
6. Adding value to society—business plan development

The planning game VAL-U was designed for education in schools and in emerging countries. The goal of the planning game is to introduce the players into the fundamentals of business management and accounting. It shall support entrepreneurship and foster socioeconomic development in developing countries.

The cross-cultural planning game has been developed for all people without or with just a few previous experiences in economy, e.g. pupils of advanced schools or founders of a new business in emerging markets.

During the game play the players should first plan their own company's operations. In a later stage, competition can be included and the players strive to have the most profitable company.

The game was developed for one trainer and about 20 participants. It can be played anywhere in an easy way, because only a printout of the templates and some materials (e.g. pieces that stand for the product and for the money) are needed. It's also possible create physical products (mechanical, electronic), texts (brochures, leaflets) or some type of food or drink (e.g. as soup, hamburgers or lemonade).

5   Conclusion

This paper presents the approach and various successful methods for the implementation of (Education for) Sustainable Development at Universities of Applied Sciences. The following findings are easily replicable at other universities.

- First of all, it is essential that a university accepts its responsibility. Universities are carrying responsibility in four different ways and to fulfil their responsibility, they need to consider the main requirements of all stakeholders (students, society, economy, scientific community).
- The exchange of information and experiences in networks is very helpful.
- A sustainability portfolio is very helpful and the basis of the implementation process. It combines sustainable development (SD) in education, research, operation and transfer (EROT) with a holistic approach of SD, specifying in the three different dimensions of SD: environment and resources, economy and management and social issues.
- Education for Sustainable Development is about the imparting of competences, especially shaping competence. It has been shown that innovative methods, like project learning or simulation games can be recommended to foster these competences.
- Universities can contribute to the great transformation by means of projects that really make an impact on society. Although several successful projects show the feasibility of "real world labs" there is much to do in order to bridge the gap between University and Society and Government.
- In addition we have seen, that various joint projects, sustainable development and transdisciplinary research and development can be successfully implemented in the cooperation of Universities.
- Educational projects and educational games are building an important method for the implementation of Education for sustainable development at universities —especially at Universities of Applied Sciences.

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