

# From knowledge to action—a field report, moving from traditional to transformational teaching and learning. A pilot model for education for sustainable development at Freie Universität Berlin

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“Sustainability is not just another issue to be added to an overcrowded curriculum, but it is a gateway to a different view of pedagogy, of organizational change, of policy, and particularly of ethos.” Stephen Sterling (2013) in UNICA Network Report

## Introduction

Accelerating anthropogenic climate change, the finite nature of fossil fuels, the shortage of natural resources, and the biodiversity loss are among today’s major environmental challenges. Coping with these issues requires a fundamental change in politics and policies related to the balance of power between countries of the global north and south as well as principle questions of ecology, economy, society, and culture. These challenges cannot be solved without fundamental political and social change. Such a transformation calls for broad societal awareness of these problems, and the magnitude of change required. Sustainability is the one idea that links all of these global problems and connects them to mechanisms of change.

In its 2011 report on “the new societal contract for a *Great Transformation*,”<sup>1</sup> the German Advisory Council on Global Change (WBGU) described the importance of education that contributes to sustainable transformation by promoting societal participation. The report singled out universities’ special role in supporting education for sustainable development (ESD) by better orienting science and policy to the societal goals of the Great Transformation. ESD means “education that enables people to foresee, face up to and solve the problems that threaten life on our planet. It also signifies education that disseminates the values and principles that are the basis of sustainable development. Lastly, it means education that highlights the complexity and interdependence of spheres, the environment, society—broadly defined to include culture—and the economy” (ESD Portal). Therefore, the UN Decade ESD that ended in 2014 seeks to promote the acquisition of “shaping competences” (*Gestaltungskompetenzen*). They describe “the ability to apply knowledge of sustainable development and to identify the problems of a non-sustainable development. This means drawing conclusions on environmental, economic, social and cultural developments in their interdependence, on the basis of analyses of the present and studies of the future, and then using these conclusions to take decisions and understand them before implementing them individually, jointly and politically” (ESD Portal, download leaflet

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Faculty website/blog:  
[www.fu-berlin.de/sustain-it](http://www.fu-berlin.de/sustain-it)  
[www.fu-berlin.de/ffu](http://www.fu-berlin.de/ffu)

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<sup>1</sup> The WBGU (2011) defines the term “*Great Transformation*” as a structural transition to a sustainable society, which must proceed within planetary limits and include a new social contract for transformation in people’s consciousness.

Gestaltungskompetenz; please note this link: <http://www.bneportal.de/english/introducing-esd/>).

The initiative SUSTAIN IT! at Freie Universität Berlin works on a number of projects in the field of ESD. With a keen interest in bringing sustainability issues to the university's curriculum, we tried to develop learning strategies that engage students as active citizens in supporting environmental, social, and economic sustainability, as called for by the WBGU's key 2011 report. Together with Dr. Achim Brunnengräber from the Environmental Policy Research Centre (FFU) at Freie Universität Berlin, SUSTAIN IT! developed a new educational format in the form of a project course in 2013. With the title "From Knowledge to Action—Socio-Ecological Transformation in Times of Multiple Crises," the course sought to promote transformational teaching and learning.

This article discusses our teaching and learning experience with the project course and demonstrates how shaping competencies in the sense of ESD could be transferred in such a format. It opens with an overview of the goals, didactic approach, topics, and methods of the course. It then describes how themes and activities have been made available to encourage other lecturers and universities to take up our approach. We end with students' evaluation and lessons learned.

### Enabling students to make change happen

Education and continuous learning are key elements for sustainable development, which calls not only for transformative research but also for a new way of education. For this reason, the initiative SUSTAIN IT! at Freie Universität focuses on interactive use of methods, interacting in heterogeneous groups, and on acting autonomously. Since 2010, the initiative has established innovative transdisciplinary teaching and learning formats. Composed of students, lecturers, and administrative staff, SUSTAIN IT! is uniquely suited to play a transformative role on campus. It uses action-oriented formats to maintain student interest and drive real change and is well connected with sustainability actors beyond the university. During the Hochschultage (university days) at Freie Universität in 2011 and 2012, the team offered a participatory program with 42 single events around the key topics of sustainable development. With the slogan "Mach mit beim Nachhalten" ("Take part in sustaining!"), the didactic approach of ESD was realized by using interactive tools such as fishbowl panel discussions, science slam, study tours, future labs, eat in discussions, theater sessions, urban gardening, art labs, and a climate cinema (for more information, go to: <http://www.fu-berlin.de/sites/sustain/hst/hst2012/index.html>).

To fulfill the idea of a transdisciplinary approach, SUSTAIN IT holds a regional network with 45 stakeholders and works together for instance with WWF Deutschland, BUNDjugend,

Greenpeace, Heinrich Böll Stiftung, Attac, Transition Town movement, Slow Food, GenderCC—Women for Climate Justice and Faktor N.

*From Knowledge to Action—Socio-Ecological Transformation in Times of Multiple Crises* launched the first-ever cooperation between a campus initiative and a lecturer for a project course. The curriculum was developed for master students in the field of political science and sought to convey practical skills promoted by the ESD framework. Although carefully planned, the course remained an exciting social experiment to the end. We are keen to share our lessons learned.

### Implementing ESD in the university curriculum

The interlinkage of different crisis phenomena such as the financial and food/nutrition crises and the energy and climate crisis raise awareness that an all-encompassing socio-ecological transformation is needed to build a sustainable society. However, it is not clear what such a transformation should look like and what it entails. What actors need to be involved at what levels and what obstacles have to be overcome? In other words, how do we proceed from knowledge to action?

The course started in the 2013 winter semester with 25 master students of Political Science. The format of the project course, lasting 4 h per week over the course of two semesters, provides more time and flexibility with teaching methods than traditional courses running over one semester. In the winter semester, this generous time budget was divided into a theoretical part conducted by Dr. Achim Brunnengräber and an active project part for developing and implementing students' ideas. The latter part was facilitated by seven active members of SUSTAIN IT!.<sup>2</sup> They contributed their expertise and offered workshops featuring facilitation methods like *Design Thinking*, *World Café*, *Open Space* as well as project management toolkits for idea generation and project design.

Information on other crucial tasks for project implementation like fundraising, participation, and public relations were provided by external experts and practitioners from local initiatives like the *BUNDjugend Berlin* (the youth organization of a national-level environmental nonprofit) and the citizen electricity initiative *BürgerEnergie Berlin*. It is this mix of academic theory, project facilitation, and expert counseling that makes the course especially fruitful for education for sustainable development.

The curriculum was developed over the course of two meetings of Dr. Achim Brunnengräber and SUSTAIN IT!.

<sup>2</sup> SUSTAIN IT! members come from diverse academic backgrounds and work and study at Freie Universität Berlin. This mix of students and (academic) university staff makes our initiative so unique. Here is a short overview of all members involved in this project course to give you an idea of our background: one PhD student, one law student, two political science students, three project managers at Freie Universität Berlin.

The joint conceptual design allowed to implement new approaches in the course schedule and to link the theoretical sessions with the practical method training from the beginning. Following the aims laid out in the framework of ESD, we focused especially on creating awareness about current consumption patterns and showing students opportunities to act in their immediate environment. The elements of enabling students and conveying shaping competences are immanent in our course goals:

- To actively engage students and their academic expertise on and beyond campus
- To familiarize students with complex economic, social and environmental challenges, and to provide opportunities for skill development to address them
- To motivate students to become active members of society, who act responsibly and creatively in their roles as citizens, employees, and consumers

The project aspect was thus central to the course, which used a two-tiered approach. In the winter semester, the 4 h were divided into two sessions—a 2-h theoretical part on the *Great Transformation* taught by Dr. Brunnengraber and a 2-h practical part for project management designed by the initiative SUSTAIN IT!. The concept of the winter semester will be described in detail below.

The spring semester focused then on the realization of the project ideas. In order to give the student groups time to work on their projects individually, the meetings were held every two weeks and served to discuss the progress of each group as well as possible synergies with other projects. Often, the meetings were relocated outside the classroom to visit project sites or to meet in the botanical garden to discuss the progress. Each student group could also choose a mentor from the SUSTAIN IT! team to provide advice throughout the second semester. Following the aim to “enable” students to realize their project ideas on their own, we chose this open, trust-based co-working atmosphere that did not stick to regular meeting times or strict deadlines.

### Winter semester session I: building a theoretical background

The first session of the course dealt with a number of basic and topical questions regarding processes of sustainable transformation and how these can be shaped. The class examined different political fields, like economic, energy, and climate politics and discussed challenges at different action levels—international, national and regional. Dr. Brunnengraber provided compulsory readings for each session in the course schedule, which had to be prepared by all students. One group of students (usually between two and five students) was in

charge of moderating the theoretical session providing a presentation of key points raised in the compulsory texts. Additionally, they were asked to send additional literature and guiding questions to their peers to prepare prior to the meeting. This was done via an online learning platform that allows FU students to effectively communicate with their classmates online. The student moderators were free to decide the setup of the session—they could choose different media or group work settings to discuss the guiding questions and were encouraged to invite external guest speakers. They discussed their plans in the course the week prior to their session and handed in a concept for the 90 min they moderated. This ensured that students were well prepared and that educational goals aspired by Dr. Brunnengraber were achieved. At the end of each theoretical part, the students were asked—in keeping with the course theme—to introduce a concrete action that could be derived from the texts discussed.<sup>3</sup>

Together, the theoretical and practical parts aimed to culminate in actual sustainability projects developed and organized by the students that raise awareness of these issues on and off campus and allow students to make changes to their own environment to deal with problems they learned about in class.

### Winter semester session II: team building and idea generation with participatory methods

Whereas the first session focused on achieving a better theoretical understanding of sustainability challenges and the *Great Transformation* and generate ideas for projects to address these, the second session of the winter semester course was devoted to putting these ideas into action.

Project ideas were not limited to campus activities but could also address issues beyond the university. Students were free in choosing their problem statement or issue. The only guideline was that “knowledge” should be translated into “action.” The basis for the project ideas was the critical discussion of established consumerist lifestyles and the presentation of sustainable alternatives. Those built on the theoretical session when diverse possible solutions for global future questions proposed by experts in research and education were debated. Additionally, the students were asked to work out project ideas that raise awareness in a wider public regarding the *Great Transformation* to a sustainable future.

The initiative SUSTAIN IT! provided students with different methodological training to support them to successfully plan and implement their projects. In the beginning, a *Design*

<sup>3</sup> A detailed course plan (in German) including an overview of the compulsory literature for each week can be downloaded from the SUSTAIN IT! website: [http://www.fu-berlin.de/sites/sustain/hst/projektkurs\\_2013\\_14/131113\\_Kurskonzept-WS-2013-2014\\_Vom\\_Wissen\\_zum\\_Handeln.pdf?1389607120](http://www.fu-berlin.de/sites/sustain/hst/projektkurs_2013_14/131113_Kurskonzept-WS-2013-2014_Vom_Wissen_zum_Handeln.pdf?1389607120).

*Thinking* workshop meant to deepen the students' understanding of the challenge and build initial project ideas. Other methodological inputs given in the second session were a *World Café* and an *Open Space* session in order to support the group formation process.

### Design Thinking

This approach is mainly applied in business to develop user-friendly services and products. With its focus on the human being—the end user—*Design Thinking* also helps to better understand the underlying structures of a problem and possible (user-friendly and desired) solutions.<sup>4</sup> We chose this innovative method at the beginning of the semester to

- Involve students in a creative and hands-on way
- Bring them together as a group—the team-building element of *Design Thinking* is enormous
- Let students dig deeper into the issue of what is needed to motivate people to act on sustainability issues and how innovative and fun solutions can be developed

Furthermore, *Design Thinking* incorporates many elements important for education for sustainable development—multidisciplinarity, creativity, experiential learning, and competency to shape the future (*Gestaltungskompetenz*).

To create a workshop atmosphere, the classroom was set up to feature five design spaces with portable whiteboards and group tables stocked with Post Its, markers, handicraft material (to build actual prototypes of the ideas) and cookies as brain food. Five student teams and coaches worked for 4 h on the question “How might we raise awareness for sustainability issues on campus and motivate people to act?” Students were encouraged to think out of the box and to come up with creative project ideas. At the end of the workshop, the five teams presented their final ideas to their peers for feedback. This first structured brainstorming laid the foundation for work on the project ideas.

### World Café

This is a facilitation method for hosting large group dialogues that can be used in a number of contexts.<sup>5</sup> Having laid the foundation for development of project ideas, we used the

<sup>4</sup> For further information on Design Thinking take a look at these websites: d.school at Stanford University: <http://dschool.stanford.edu/>.

IDEO design consultancy: <http://www.ideo.com/about/> as well as Open IDEO an online innovation platform working with the design thinking approach <https://openideo.com/> (take a look at the educators section).

<sup>5</sup> For more information on the World Café method visit the following websites: The World Café: <http://www.theworldcafe.com/overview.html>; Youtube video explaining the process: <https://www.youtube.com/watch?v=YrTKD8NpApY>.

*World Café* to help students develop a clearer outline of their project ideas. Again, the classroom was reorganized to feature five different tables; music, coffee, and tea created a stimulating coffeehouse atmosphere. The SUSTAIN IT! coaches prepared different questions that were revealed one after another to the whole group. The questions build on each other to help facilitate the idea structuring process were the following:

- Up to now what fascinated you most about the course?
- How should a sustainable Freie Universität look from your perspective?
- What projects will help us realize this vision?

Five student volunteers acted as hosts collecting the results of the discussion of each question at the table; the other students rotated in the room adding new perspectives to previous discussions. The discussions focused around which project ideas would help them raise awareness have the most outreach and be viable in the context of the project course. The core visions were collected on Post Its and flip charts which were later presented by the hosts to all students.

After the 2-h session, a number of project ideas emerged (some of them building on the prototypes developed in the *Design Thinking* workshop). Along the motto “an idea finds a team,” we subsequently organized an *Open Space* to help students to further concretize their ideas, identify the right project, and to build teams.

### Open Space

*Open Space* formats are used to help organize complex group settings. It is sometimes referred to as “intentional self-organization.”<sup>6</sup> Students with concrete project ideas hosted a space and discussed possible ways for implementation. Other (undecided) participants were free to choose which discussion to join and allowed to freely circulate between projects. The openness of this format also allowed for spontaneous discussion in addition to the project ideas. It helped organize the students and introduce the different project ideas. At the end of the session, five groups of students formed to work on their respective ideas, which will be introduced in detail below.

In addition to these methods for idea generation and group formation, practical course sessions of the winter semester offered expert talks to help students to successfully realize their projects. A session on strategic planning discussed how to set up a project management plan and achieve goals in a timely manner while keeping the motivation high. A guest speaker from *BUNDjugend* (a German environmental organization) discussed fundraising strategies and helped students find viable funding for their own projects. Students made

<sup>6</sup> For more information on Open Space, go to <http://www.openspaceworld.org/cgi/wiki.cgi>.

use of different strategies introduced—one group successfully applied for funding from a political foundation, another group received funding and material from different units of the university, while a third group collected donations to support the work of an NGO. In addition, one group made use of the personal contact with *BUNDjugend* and won the organization as a partner for their project.

Another key aspect of the project implementation was the sustainability of the project in the long run, which students identified as closely linked to participation. A guest speaker from the citizen initiative *BürgerEnergie Berlin* was invited to talk about his experiences in this area.

### Student project work for a sustainable future

Motivated by team processes discussed above, five different projects emerged in the project course, initiating several subsequent projects and events. The five project groups (two to eight students each) covered different topics and varied in format and time frame. Three groups worked on the questions of nutrition, food production, and water. Two other groups addressed the issues “Green Capitalism” and renewable energy production.

The concrete project ideas, their practical approaches, target groups, the people involved, and their achieved successes are outlined in the following.

#### UniGardening—Edible Balcony and Information Path

Eight students dealt with the subject of alternative food production and food consumption. Their aim is to offer a simple and applicable solution for everyone at home: grow your own food on your balcony and enjoy healthy and home-grown vegetables.

The *Edible Balcony* forms a cooperation with the university permaculture gardening project *UniGardening—Permakultur zum Anbeißen* that was formed at the same time, initiated by the university’s botanical garden, the TU Berlin, and SUSTAIN IT! and realized by students and employees of TU Berlin, FU Berlin, University of Potsdam, and interested citizens. Here, the *Edible Balcony* group found a perfect location to illustrate their alternative conventional food production and consumption: using the motto *think globally, act balcony*, the group built a prototype vertical planting system with crops and food plants suitable for a balcony. The *Edible Balcony* presents several benefits. It offers city dwellers the possibility to grow their own food, to raise awareness about food production processes and to enjoy the fruits of their labor. Additionally, the increased greening of the city by urban gardening can contribute to reduce the urban heat island effect and the greenhouse gas emissions from food transport. In addition to the balcony prototype, an *Information Path* supplies visitors with

information on topics such as food speculation, food waste, and working conditions for food production in the global south.

The *Edible Balcony* was involved in several public events and profited from different cooperations as mentioned above, thus reaching a wide and diverse public beyond the university. They offered guided tours in the context of city-wide public events related to urban nature, i.e. “Langer Tag der Stadtnatur” in June 2014 and “Botanische Nacht” in July 2014 and explained the principles of the balcony and vertical greening to interested visitors. With the tours, the students reached about 350 guests. Furthermore, the project was covered by several press articles<sup>7</sup> and attracted the attention of other cultural institutions such as the *Goethe-Institut Kairo* that showed interest to report about the project in their dossier. The US Embassy Berlin honored the students for their project as *Green Ambassadors* in the course of their *Green Ambassadors Initiative*.<sup>8</sup>

The *Edible Balcony* prototype itself is a sustainable project. It will continue to exist as long as the *UniGardening—Permakultur zum Anbeißen* project in the botanical garden Berlin, where it is located, will be continued by the project group.

#### FUUDKorb (Food Basket) — Solidarity and Organic Agriculture on the Campus

This food cooperation organized by four students brings solidarity and organic agriculture to Freie Universität. The target groups addressed are mainly students and employees of the FU Berlin but also interested people from outside the campus.

With a monthly membership fee, members receive fresh, organic, and regional fruits and vegetables from the local organic farm *Biohof Speisegut*. In addition, members support the farmer with a work input three times a year, allowing them to learn about organic farming and the labor-intensive process of food production. *FUUDKorb* thus offers an alternative to food production sources provided by global corporations, sensitizes people to the value of food and supports sustainable, organic and healthy fruit, and vegetable production in the Berlin region. The *FUUDKorb* backs local farmers and fair working conditions.

The group received great feedback—all 10 available memberships were taken within a few days by students and employees of the Freie Universität. There is a waiting list with five more requests for future memberships. As a long-term project, the *FUUDKorb* will continue to exist until the current membership contracts end in June 2015. An extension is possible and envisioned by the group.<sup>9</sup>

<sup>7</sup> Further information and press reports on the project can be found on their Facebook page <https://www.facebook.com/pages/UniGardening-Essbarer-Balkon/1449980101910806>.

<sup>8</sup> [http://www.fu-berlin.de/campusleben/lernen-und-lehren/2010/100324\\_gruene\\_botschafter/index.html](http://www.fu-berlin.de/campusleben/lernen-und-lehren/2010/100324_gruene_botschafter/index.html).

<sup>9</sup> Further information on the *FUUDKorb* can be found in this press release [http://www.fu-berlin.de/campusleben/lernen-und-lehren/2014/140619\\_fuudkorb/index.html](http://www.fu-berlin.de/campusleben/lernen-und-lehren/2014/140619_fuudkorb/index.html)

### Charity: Water - Reusable Water Bottles

Two students created a project to raise awareness on the possibilities of waste reduction by consuming tap water in reusable glass bottles and the responsible use of drinking water. For informing about the latter, they cooperated with the NGO *charity:water* and donated the raised money to the organization. Their idea was to create a design for reusable glass bottles, with the logos of the NGO *charity:water* and SUSTAIN IT! and a QR-code leading to changing webpages containing information on sustainability topics such as clean water access for health and sanitation. With the bottles, the group aimed to offer students a resource-efficient product and raise awareness for a socio-ecological transformation.

Together with a short presentation of the NGO *charity:water*, the group distributed 90 bottles to students at Freie Universität and collected 100 Euro of donations. The bottles were gone within 2 h and students showed much interest regarding the project. One hundred percent of the money raised would directly fund sustainable water projects by *charity:water*, a US-based NGO for clean drinking water access all over the world. Employees of the NGO were very enthusiastic about the project and will provide the students with further information once it is clear which project the money will be used for.

### Energy Laboratory — A Vacation Program for Schoolchildren

Cooking vegan spaghetti with a solar cooker, building wind turbines and water wheels, making toy boats driven by the use of an egg and a candle—this is how 15 children aged between 10 and 12 learned about sustainable alternatives of energy supply during a workshop organized by the group *Energy Laboratory*.

The group of five students used the principles of bottom-up sensitization, developed the whole workshop program<sup>10</sup> themselves and cooperated with the *UniGardening/Edible Balcony* group to offer a 4-day workshop in the *UniGardening* location in the botanical garden Berlin to sensitize kids in a playful and experimental way to the global challenge of energy consumption and the practical experience of renewable energy alternatives. Several self-made experiments and a visit to the university's solar roof and meteorological tower captured the childrens' curiosity and prepared a potential new generation of renewable energy enthusiasts. The workshop was organized in cooperation with the youth organization *BUNDjugend Berlin* and *Schools@University for Sustainability + Climate Protection*. Before the official event, the group offered a smaller version of their workshop (*Energy Lab: Discover, understand and produce renewable energy by yourself*) during the city-wide public event *The Long Night of Sciences* in May

<sup>10</sup> An article on the workshop (in German) can be found here: [http://www.fu-berlin.de/sites/sustain/hst/Ferienaktion\\_Energieerzeugung/index.html](http://www.fu-berlin.de/sites/sustain/hst/Ferienaktion_Energieerzeugung/index.html).

2014 (Link: [http://www.fu-berlin.de/sites/sustain/hst/lange\\_nacht\\_2014/index.html](http://www.fu-berlin.de/sites/sustain/hst/lange_nacht_2014/index.html)).

The project addressed basic ESD principles: it provided the students with the opportunity to convey their knowledge about sustainable energy consumption to young school children, it was put into practice in a creative and interactive way supporting the development of shaping competences for both the students and the kids and it raised awareness about the energy consumption patterns the participants have in everyday life.

### Panel Discussion: Is Green Capitalism Possible?

The crisis of capitalism raises questions that need to be discussed—including social conflicts, climate change, oceans full of trash, increasing food prices in the global south and the financial crisis in the west. Five students organized a panel discussion at the Freie Universität to address questions such as “Is capitalism based on cheap raw materials and energy carriers coming to an end?” and “Is a sustainable transformation to a Green Capitalism possible?” The group invited Prof. Dr. Birgit Mahnkopf and Prof. Dr. Markus Wissen from the Berlin School of Economics and Law and moderator Susanne Götze from the climate change news website *klimaretter.info*, who led a stimulating debate attended by roughly 200 participants.

Although a panel discussion is a unique event, the project group made an effort to steer an ongoing discussion. Therefore, the group recorded the entire discussion and made the video and a website featuring a discussion forum available to the public.<sup>11</sup>

The successful realization of all five projects shows that the open format of the project course in the spring semester provided enough room for self-organized student work and was used responsibly. Regarding the grading of this very open format, Dr. Brunnengräber decided to collect the following courses work:

- Students had to moderate one theoretical session and prepare a presentation.
- Student teams had to provide a draft of their project idea by the end of the winter semester including a schedule, budget plan, and theoretical background explaining the additional benefit as well as sustainable character of the project.
- Student teams handed in a final report in form of a portfolio, including the theoretical background, idea generation, project realization as well as lessons learned.

Grades were given by Dr. Brunnengräber on the basis of all three assessments.

<sup>11</sup> The video recording (<http://www.youtube.com/watch?v=jClEpETfEd0>) and an article on the panel discussion (in German) can be found here: <http://www.klimaretter.info/forschung/hintergrund/16354-gruener-kapitalismus>.

## Evaluation of the project course

In order to evaluate this new course format, SUSTAIN IT! designed an evaluation form tailored to the specific characteristics of this pilot project. The empirical evaluation of the immediate impact of ESD projects is a great challenge, as it is hard to measure the actual competences conveyed and the sustainability of the projects in the long run. Also, we cannot provide data on if or how the students and other participants of the projects applied their knowledge about sustainability in their everyday life. That is why, attention was especially paid on getting insights about the personal perceptions of the students, and therefore below, we rather supply an account of the personal assessments of competences acquired than scoring results. The evaluation focused on six issues: the development of personal competencies that are of great importance with regard to the *Great Transformation* (ESD shaping competencies), changes in students' personal motivation and participation, benefits of the cooperation with SUSTAIN IT!, differences from other university courses, the course relevance to the *Great Transformation* and the realization of the course title *From Knowledge to Action*. The majority of the students stated that they were very satisfied with the course. It affected the students on different levels—academically, socially, and personally.

Regarding the development of ESD shaping competencies, students stated that the project course provided them with an in-depth understanding of the complexity and interaction of global crisis phenomena such as climate change, the protection of natural resources and global justice. Additionally, students reported that they felt content with their development of critical and solution-oriented ways of thinking. A large majority stated a high satisfaction with their ability to determine and analyze problems of non-sustainable development in a forward-looking manner.

Nearly two thirds (63 %) of the students felt that they learned the appropriate methodological competencies for project work. This result suggests the value of investing more course time in such training. More importantly, half of the students saw a need to strengthen interdisciplinary working methods.

Most of the students (more than 80 %) reported that the action-oriented concept of the project course increased their motivation and personal involvement. One student stated in the free-text comments: “The transfer of knowledge combined with the joint development of a project enhances motivation.”

The majority of students reported a significant increase in understanding and knowledge and appreciated the chance to intensively (two semesters) work on a freely selected topic with a clear practical relevance.

On a social level, students stated the positive experience of team building and carrying out a project together. Not only did the students develop closer professional contacts to established NGOs such as *BUNDjugend Berlin* but also did they mention the value of new friendships with their peers resulting out of the close teamwork. Furthermore, intense

thematic discussions and close cooperation with the lecturer and volunteers of SUSTAIN IT! strengthened mutual recognition on a professional and personal level. The groups received much positive feedback from people in and beyond the campus and from the press.

A student reported a “changed attitude toward sustainability and ecology” and a more positive view of one's own capacity to effect change. The independence to work on their own projects made them feel trusted. Another commented: “You can always find supporters for meaningful projects if you ask for support.” Other students reported that the project course strengthened competencies that are very relevant for their future professional life. The sense of responsibility and involvement of the students were remarkable. With their projects, the students did not only influence people on and beyond the campus but they also reported a high influence on themselves concerning questions of changing their behavior to take action for sustainable development: “It is very rare that my behavior changed this much due to a university course.”

A large majority of the students found the cooperation with SUSTAIN IT! beneficial. Most valuable here was the advisory project mentoring followed by the methodological support in *Design Thinking, Strategic Project Planning, and World Café*. Asked about the perceived personal new insights thanks to the project course, a student reported that he learned “to go new paths in thinking using different facilitation methods.”

Students saw some key benefits to the project course in relation to other university offerings that operate in the standard format of 2-h per week and without a project focus. They acknowledged the course's flexibility, which allowed them to more deeply consider the topic of sustainability. They also appreciated the practical work and the different teaching and learning approaches introduced by the team of university lecturer and SUSTAIN IT!. Most of the students considered the course format meaningful of the *Great Transformation*. Furthermore, 99 % of the students thought the goal to move *From Knowledge To Action* was successfully reached with the successful implementation of the five projects.

However, students complained that the topics sustainability and socio-ecological transformation are under-represented at the university. These remarks point to the importance of formats such as the project course.

## Course impact

Over the course of two semesters, the students learned the following:

- Analyze and determine non-sustainable developments on and off campus and to develop appropriate strategies and sustainable alternatives to meet such challenges

- Raise awareness for the interdependence of crisis phenomena: e.g., the Edible Balcony group: for growing your own vegetables (addressing the food crisis), you firstly need healthy organic seeds and soil (addressing the problem of genetically modified seeds and the overexploitation and contamination of soil)
- Work in a self-determined autonomous manner but also face and use critical feedback from SUSTAIN IT!, the lecturer, other course participants or external individuals or organizations/cooperation partners
- Overcome difficult situations in teamwork by applying project management tools and trustful communication or by asking for help by external mediators such as SUSTAIN IT! mentors
- Use synergies: some of the projects complemented or supported each other, increasing the scope and influence of each project
- Familiarize with project management and work with new methodological tool kits to successfully plan and implement projects
- Stimulate critical discussions on important topics and inspire people to rethink their behavior

The project course contributed to training and strengthening students' 21st century learning skills such as creativity, communication, and collaboration (LSF - Learning for a Sustainable Future 2014) and important competencies promoted by the UN Decade of Education for Sustainable Development such as critical thinking and collaborative decision making (UNESCO 2005).

All students successfully implemented projects during the course. Some continue to exist, although the project course has come to an end and are envisioned to be continued in the semesters to come (e.g., the *FUUDKorb membership*; an *Edible Balcony* prototype). Project work always requires an extraordinary amount of motivation and personal engagement, but our project course also proves that students are willing to invest extra time for their projects and report a personal impact on themselves that they view as much more intense compared to conventional course (theory-based, 2-h) formats.

### Lessons learned

The course evaluations show that the project course in cooperation with a volunteer initiative like SUSTAIN IT! is regarded as an effective format by student to familiarize them with today's complex economic, social, and environmental challenges and to allow them to acquire knowledge, skills, and awareness necessary to actively and responsively shape

a sustainable future. Not only could SUSTAIN IT! support the students with their experience and existing networks but the exchange with the students and the lecturer was also very fruitful for SUSTAIN IT! itself. Our initiative received constructive feedback, gained new members, and established future cooperations. We also learned that some student groups need more support than others. While some groups stood in intense exchange with our initiative and the lecturer, others preferred to work autonomously and only present their interim status for discussion in the plenum.

The students gained valuable insights from the invited guest speakers and experts as the fundraising successes and cooperation with external partners show. For future project courses, a diverse and transdisciplinary spectrum of speakers should be considered. Interdisciplinary, transdisciplinary, and participatory approaches need to be further strengthened. Asked for their opinion towards the possibility to repeat the project course together with master students from other departments, the students highly endorsed such interdisciplinary approaches. In addition, it was discussed that sustainability project courses should be implemented in the bachelor curricula as well, given the strong weight of theory during the bachelor's program and allowing that ESD can start as early as possible.

At the same time, the students reported that sustainability, practical project work, and methodological training do not receive enough attention in conventional academic curricula, making the project course a valuable addition to university offerings.

### An example to follow: how to implement ESD in current curricula

The challenges we face require diverse competencies and creative, flexible strategies and decision-making. The project course *From Knowledge to Action* sought to impart skills seen as critical for education for sustainable development. Transformational participatory teaching and learning aims to reach beyond the simple dissemination of theoretical knowledge but encourages students to apply their knowledge to their immediate environment. The social experiment of SUSTAIN IT! and FFU shows that participatory methods enable students to realize their expertise in real-world projects. Our pilot project course can help educate students to be a part of the *Great Transformation* by giving them a deeper knowledge of the key challenges, and empower them to make changes in their own lives, their universities and communities, and in society at large. The results of our course and the ongoing engagement of the students amaze us and encourage us to work on transferring this innovative approach to other universities, encouraging others, to adopt this exemplary idea.



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