TEACHING SUSTAINABILITY – AN APPROACH TO VALUE-INTEGRATIVE HIGHER EDUCATION IN CORRESPONDENCE WITH THE UN´S SUSTAINABILITY GOALS

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Abstract

Through the UN’s sustainability goals, universities and teachers are increasingly asked to incorporate the content of sustainable development issues into their teaching. The "Higher Education Sustainability Initiative (HESI)" [1] expresses this intent and explicitly aims to support the implementation process of the sustainability goals by universities. A main aspect is, among others, the universities' obligation to integrate sustainable development topics into all their degree programmes. Therefore, there is a marked need for new or modified didactic concepts.

Beyond considering the demands for modern higher education being urged by the concept of Education for Sustainable Development (ESD), this article particularly deals with their practical implications for everyday teaching. On the basis of three exemplary seminars, which were realised at the Bochum University of Applied Sciences during the last semesters, the combination and unification of sustainability issues and specialised topics will be discussed. Due to the complexity of underlying approaches and normative policies from the field of sustainability, new requirements for the design of reflexive and (value-) integrative teaching concepts are necessary. In the actual teaching situation, this strongly affects the role of the teacher and to a large extent leads to promoting the students’ creative and personal competences.

For teachers, dealing with technical and methodical contents on the one hand and including reflexive and systemic sustainability topics on the other hand, remains a quite noticeable challenge. However, the results of two student surveys from the Bochum University of Applied Sciences show, that precisely this integrated approach remains to be the key to a permanent and overall understanding of ESD at universities, following on from everyday teaching practice.

Keywords: Education for Sustainable Development, teaching role, value-oriented teaching, critical thinking, learning coach.

1 INTRODUCTION

This essay focuses on the challenges of integrating sustainable development topics into the curricular requirements of pre-structured disciplinary studies at higher education institutions. While ideally a more holistic approach and change of the educational institutions themselves may be necessary [2], the aim is to develop a practice-oriented approach that conceptually takes restrictions of day-to-day design of teaching into account. Therefore, already existing didactic concepts are reviewed and considered. Furthermore, new teaching/learning concepts, such as "transformative education" are compared to older didactical ideas of critical thinking which offer an ideal basis for developing new models of sustainable education.

Sustainability science is characterised by a normative claim which, as a result, also clearly defines education for sustainable development. Not only the training of knowledge, but also of norms, goals and values, such as intergenerational justice, are defined as premises or are interdepending. In addition, the orientation towards the solution of social problems and the related necessity of inter- or transdisciplinarity have to be considered as well. The complexity of the current global challenges requires the co-work of inter- and transdisciplinary teams in order to find adequate solutions.

In the following article, the relevance and need for new concepts for integrating sustainability issues and education for sustainable development will be demonstrated on the basis of results of two empirical studies at Bochum University of Applied Sciences. Subsequently, three seminars conducted at the Bochum University of Applied Sciences will be presented, which illustrate how exactly the triad of (1) communicating and reflecting values and norms of sustainable development, (2) orientation
towards concrete societal challenges and (3) claiming interdisciplinarity or transdisciplinarity in teaching can be fulfilled.

The adaptation of theoretical considerations of ESD for conventional (subject) education at universities is often challenging. It is obvious what is to be achieved hypothetically, but not how to get there with the framework conditions for seminars usually being prevailed at universities. Nor is it obvious, how existing (subject) teaching at universities can be linked to normative guiding principles, beyond the mere picking up of sustainability topics in the seminar process. In this respect, this essay attempts to close the gap and presents various ways of embedding integrative sustainability-oriented teaching concepts.

2 METHODOLOGY

The conception, implementation and evaluation of three seminars for students of different subject groups form the groundwork for our analysis. Based on empirical results and implications from two student surveys, all three teaching conceptions aim at integrating sustainable issues and a transformation of the role of the teacher.

2.1 Empirical Results from Two Student Surveys at Bochum University of Applied Sciences

Although the access to sustainability topics is difficult to depict in surveys, the results of two student surveys at Bochum University of Applied Sciences show that there is a considerable need to integrate these issues into teaching. The study "Sustainable Perception Index" (SUPER) from the years 2013 to 2014 [3], [4], [5] and a subsequent first trend study in the winter semester 2015/16 were set up to document the long-term effects of education for sustainable development [6]. The trend study focused on the dimensions of knowledge about sustainability, assessment of sustainable development issues, the (sustainable) characteristics of student lifestyles and other influencing factors and priorities from the SUPER study. Both studies reveal student dispositions and enable comparisons with other panel surveys on diversity and sustainable development [6]. Thus, a detailed differentiation was made according to various socio-demographic characteristics. Moreover, differences between students from different study programmes could be clearly identified.

Both studies show how students from different disciplines are positioned with regard to the various sustainability dimensions - ecological, economic and social - and how strongly the knowledge level of the students differs. The most comprehensive knowledge was found for ecological topics, followed by economic topics. Overall, knowledge of social topics was lowest (cf. Krause-Steger and Roski 2014b).

In addition to the findings concerning the three dimensions considered, there were also differences regarding gender and between the different subject groups. The sustainability students and the students of the construction competence area as well were able - possibly due to the stronger integration of topics of sustainable development into subject studies - to demonstrate a higher proximity to the topic in terms of their knowledge and a deeper understanding of the sustainability concept. This shows that the combination of specialised training and sustainability topics leads to a greater anchoring of the overall topic among the students.

It is also noticeable that students with a consistently rather low level of knowledge (especially in the social dimension) at the same time express a high level of interest in these topics and assess the subject-related link within their disciplinary courses as inadequate or even non-existent [3], [4], [5], [6].

2.2 Implementation in Teaching - Three seminar examples at Bochum University of Applied Sciences

The empirical results were used, in combination with the frameworks of the UN’s goals and also the indicators of the Global Reporting Initiative, to conceptionally design new seminars or enhance existing teaching formats. In the following, three different teaching examples will be described more in detail.

Essential to all these three exemplary seminars was the linking of sustainability issues on the one hand and the combination of technical and methodological skills on the other. The seminars were offered either as part of interdisciplinary training ("General studies") or in the first study phase of the interdisciplinary Sustainable Development study programme. Thus, an additional advantage was that all of these student groups were more interdisciplinary than usual.
1st Seminar: "English Conversation in the Context of Society and Sustainability", General studies and Sustainable Development study programme.

2nd Seminar: "Society and Social Sustainability - Democracy in the Age of Social Media", General studies.


In all three seminars, topics from all three sustainability dimensions were discussed along methodological and disciplinary questions. The aim was to provide students with a reflective mind to various sustainability issues, in addition to language and methodological competence. In the second seminar, students were introduced to a critical discourse on social media as well as sociological and societal theories.

The didactic concept was therefore based on a consistently integrative approach of linking specialist content with discourses, problems and solutions from the field of sustainable development.

2.3 English Conversation in the Context of Society and Sustainability

The seminar was located in the General studies as well as in the studies of Sustainable Development. In each of the individual sessions, various current topics from the field of sustainability were critically discussed. For this purpose, (journalistic) texts, video documentations or audio files were used as input for the discussion. For developing linguistic competence, reading, listening and language competences were trained, supplemented by grammar units and vocabulary exercises related to the respective topic.

All topics consistently addressed the UN's sustainability goals. In this way, the various sustainability focal points were brought closer to the students through direct references to their actual living environment. The individual seminar sessions dealt with current problems from social, societal and ecological areas. Furthermore, the students always had the opportunity to bring in their own topics related to the main focus of the seminar.

In addition, various interdisciplinary approaches to solutions were discussed, which were promoted above all by the different backgrounds of the students. The role of the teacher proved to be decisive in this context. It was characterised by a more student-oriented attitude, which excluded an all too dominant "teacher's opinion" and required a more moderating attitude.

At the same time, the teacher used his or her own level of knowledge to initiate critical discussions and often - irrespective of his or her own opinion - took the opposite position, such as an "advocatus diaboli", in order to help the learner to gain his or her own insight (for information on "advocatus diaboli" as a method in adult education, see e.g. [7]).

The important goal were an open-mindedness discussion, i.e. critical reflection and the illustration of different positions, an argumentation and mediation of positions. The high relevance of teaching ‘critical thinking’ especially in ESD is reflected in many publications (e.g. [8], [2]). Accordingly, the role of the teacher must be adjusted. The basis for this idea is the teacher's role as coach and learning companion, which focuses on the self-learning of learners [9]. Herefore, the teacher’s professional background should help not so much to define a fixed learning goal as rather to create a framework for the discussions and enrich the conversation through impulses and factual backgrounds, guaranteeing a scientific basis for the discourses and, if necessary, correcting contents and putting them back into a solid professional context.

2.4 Society and Social Sustainability - Democracy in the Age of Social Media

This seminar was also part of the university's interdisciplinary programme. The special feature of the General studies is that students come together in a very heterogeneous composition and can discuss interdisciplinary topics in interdisciplinary groups. Thus, the General studies offer a particularly good framework for approaches of education for sustainable development.

Connecting with the current debate on the increasing spread of social media and its effects on society, opinion-forming and communication processes were addressed along the students’ everyday experience and clarified the political dimension of their own private communication behaviour and media use. Using concrete examples from their everyday practice, students should be explained and clarified complex socio-political contexts in order to create a meaningful and sustainable link between abstract knowledge and actual problems.
In a conceptual network of current and everyday phenomena with social and transformation theory as well as dystopian scenarios from future and entertainment literature, such as The Circle [10], students were introduced to critical views on trends such as the renunciation of privacy, power through information and the value of knowledge as well as the political influence of modern information technology. Among other things, "bots" and profile generators were discussed, but also the blurring of facts and opinions and the increasing emotionalisation in political discussions, shitstorms and the Internet as a rule- and law-free space. Moreover, it became clear, how democratic participation and commitment are radically changed by modern media and thus how social media has a massive impact on society [11].

In addition, social media as a thematic focus very succintly revealed a generation gap in teaching, since students have a completely different approach to modern media than teachers and sometimes evaluate their experience in virtual space completely differently. In this respect, the selected seminar topic promoted an intergenerational dialogue. The reference to various sociological theories (including [12], [13], [14]) again embedded the discussion in an overarching scientific context and guaranteed a discussion guided by scientific results without losing the reference to current social discourses.

It is precisely this combination of life-worldly and scientific knowledge that is a fundamental prerequisite for transdisciplinary education for sustainable development ([15], p. 30). The high relevance of combining scientific knowledge and life-worldly problem-solving processes in transdisciplinary research (cf. [16], p. 6ff.) is transferred to teaching/learning situations. The students acquire the competence to relate abstract science and relevant knowledge ([16], p. 7) to one another and thus to develop new perspectives, both on the social interpretation of the problem under consideration and on the corresponding scientific understanding. The discursively designed teaching concept of the seminar takes up exactly this point and connects different knowledge bases with each other. This orientation also applies to the following seminar.

2.5 Scientific work and presentation

In the seminar on scientific work, the students of the sustainable development studies were introduced to methods and rules of the scientific system and various subject paradigms. At the professional level, this involved teaching presentation skills and the quality characteristics of scientific work, from citation and the development of scientific work to scientific methods.

Current topics from the field of sustainability were presented and offered as examples for training scientific methods. On the one hand, the students developed a structure for a term paper and a presentation on a sustainability topic. On the other hand, technical problems, such as the question of the distinction of scientific and non-scientific sources, were used to refer to overarching technical discourses and to discuss current debates on modern science and its social integration (cf. exemplarily [17], [18]). Thus, current contexts of society as a whole were added to the concrete mediation of the subject, and a bridge was built to overarching aspects such as the social dimension of sustainability, the question of legitimacy and democracy, as well as distributive justice with regard to knowledge resources, access to education and knowledge, etc.

For example, the “March for Science” was discussed as international protest by scientists as well as the political attack on the fact orientation of science was considered (e.g. [19], [20]). On the other hand, there are unproven opinions, which increasingly take up space in public discussion with claims such as the "climate change lie" [21]. Through the connection with current social discourses, a scientific understanding of sustainability sciences was established.

On the basis of the topics presented and the illustrative literature, which consisted of journalistic articles, current topics were focused and dealt with and not only scientific articles and points of view were deliberately included. Thus, in the sense of transdisciplinarity, the attitudes of other social stakeholders could be considered as well and, for example, be compared to scientific approaches.

3 RESULTS

Based on the evaluation of the three seminars, various conclusions regarding the general conception of ESD and the teaching concept are drawn. A special focus will be on the role of the teacher.
3.1 A Teaching Concept for ESD

As we have seen, education for sustainable development, in its own normative claim alone, implies the need to communicate norms and values of sustainability. This is expressed, as it were, in a value-based "teaching model" which contains these values and entails the necessity of their reflexive and discursive communication. Directly linked to this is the orientation of teaching towards existing, current global issues and towards inter- and transdisciplinarity in dealing with these topics.

All this together forms a triad of Education for Sustainable Development, as shown in Fig. 1. The three aspects mentioned are equally relevant here.

![Figure 1. Triad of Education for Sustainable Development (own presentation)](image)

This triad of ESD leads to different implications for the design of teaching formats:

1. In order to convey values and norms and to enable their critical reflection, the appropriate spaces for joint discussion and critical discourse have to be created in teaching. This is accompanied by corresponding demands on the role of the teacher.

2. The orientation towards existing and current social questions requires a strong topicality reference in teaching and can therefore also establish a direct link with the current world of students.

3. To convey inter- and transdisciplinary approaches to solutions, teaching concepts are advantageous which, in addition to the primary consideration of contents of sustainable development, also make it possible to convey methodological competences, scientific contents or foreign-language competences. In this way, this twofold thematic access not only enables the training of diverse skills and contents, but also establishing courses for an interdisciplinary group of students and the generation of inter- and transdisciplinary courses.

Stoltenberg and Burandt argue that the values conveyed by Education for Sustainable Development are explicitly concerned not only with an interweaving of social and ecological responsibility, but also with its global validity (cf. [22], p. 574). Since the framework of values must be negotiated, it is absolutely necessary for learners to form their own position, based on the subject in the first place. In the next step, they learn to participate in the active interpretation and discussion of values in the context of sustainable development (cf. [22], p. 574).

In order to develop these competencies, social, economic and ecological topics and discussions are shown and communicated and learners are given the space not only to participate, but to position themselves and thus also to understand and experience how value frameworks can shift again, in order to react flexibly to them and to be able to deal with systemic changes.

Besides, the framework of sustainability education implies that a suitable didactic concept must develop towards problem-based learning in order to prepare learners for the solving of sustainable problems. This requires a specific basic attitude of the teachers in the didactic discourse.
3.2 The role of teachers in ESD provision at universities

The exemplary role of the teachers here is based on ideas of constructivist pedagogical theory and also on modern approaches such as “transformative learning” and “Gestaltungskompetenz” as being discussed in current sustainable scientific German literature as well as e.g. in UNESCO publications about ESD [23].

As ESD is concentrating more on enabling the students, the focus on the teacher and the formal learning process shifts toward a more “learner-centring” teaching setting [24].

The development of “Gestaltungskompetenz” is about acquiring “a set of key competencies which are expected to enable active, reflective and co-operative participation toward sustainable development” ([24], p. 418). In this respect, Rolf Arnold's constructivist teaching approach is very well suited to the design of sustainability-oriented didactics, since it is explicitly concerned with enabling and supporting learners to learn on their own. At the same time, this means that the teacher is also prepared to engage in his or her own learning process as barrier-free as possible. Especially Arnold’s remarks on ”enabling didactics” highlight the role of the teacher, which is to be a “learning companion, learning arranger or coach for learners” [25].

The challenges of sustainable development are so complex that even with the most well-founded specialist training, there are only few viable ideas for fundamental global key problems so far. It is therefore advisable for teachers to abandon their own ”attitude of superiority” and enter into a democratically open learning process with the students in order to help generate creative new ideas and approaches and strengthen the students' analytical ability and their own solution potential.

Starting from the didactics of enabling, Arnold's ideas for the reflection of the (changed) teaching role and the concrete teaching practice are primarily taken up here, without, however, at the same time following the radically constructivist theory, which Arnold's constructivist-system-theoretical approach assigns to.

In English literature, approaches linking constructivist learning theories with modern ESD often refer to Dewey’s problem-based and experiential education [26]. And indeed, if you have a look at the substantially needed competencies worked out in the literature of the UN’s decade of ESD (2005-2014) being named as “critical and systems thinking, communication and collaboration skills”, you can easily link to Dewey’s ideas e.g. in “Democracy and Education” [27], [28]. Dewey’s vision of an active learner-citizen and agent of change could be a suitable vision for the hoped outcomes of sustainable education. Also did Dewey underline his assumption of societal problems and social phenomena as being dynamic and relational and pointed out their interdependencies and therewith promoted systems thinking as crucial concept for modern education. His theory became a key model for educating “critical thinking” as well [26].

Constructivist sustainable pedagogy can be seen as radical in so far as it urges to reform our educational system from scratch. Traditional disciplinary and often single perspective teaching might have led to many of the ecological problems being caused by former “technical solutions”. If you consider the constructivist idea of “There is no single way of understanding” you see the reformist potential for specialised education, especially for engineering and nature science [29]. Opening up the linear curricula to new different and more open concept such as reflexive units of simply asking questions and taking up multiple different perspectives might be a helpful start for implementing ESD into conventional education.

4 CONCLUSIONS

The high relevance of interdisciplinary and transdisciplinary research in the environmental and sustainability sciences ([16], p. 5, [17], p. 323f., [30]) also demands a “rethinking” in a corresponding education for sustainable development. Complex problems and ambivalences concerning treating conflicts as well as developing solutions require to a large extent that students not only acquire an appropriate knowledge base in relation to these topics and problems, but also build up the competencies to be located at the level of personality development for weighing up arguments, for (self-)reflection and critical discussion, etc.

ESD also concerns, but by far not only, the integration of sustainability topics into the curricula of existing and newly emerging degree programmes, but goes far beyond this in terms of its aspirations. Promoting creative competence and linking to scientific and life-worldly knowledge create the premises for an integrative or transdisciplinary problem solving.
The results of the two student surveys show the positive effect of linking subject and sustainability topics. Exactly this was included in the conception of the presented teaching concepts. The three exemplary seminars illustrate how an integrative approach to teaching makes it possible to link specialist topics with sustainability topics and to combine them with reflection-oriented teaching formats. It can be a step towards promoting students’ creative competence. This, however, significantly changes the demands placed on the role of the teacher. They are increasingly expanding in the direction of accompanying or moderating teaching. Teachers become learning companions and coaches and must create open discourse spaces in their seminars that enable students to develop a self-reflexive attitude to various topics, in the sense of creative competence.

This is associated with a constructivist understanding of science, a more open-minded attitude that does more justice to the complexity of sustainable societal issues and the often inter- and transdisciplinary approaches to solutions associated with them. The attitude of teachers as learning coaches presented in this article outlines an orientation for teachers who wish to orient their self-image more towards education for sustainable development and who wish to introduce and expand an integrative concept of sustainable education into their didactic practice with student groups at universities. The examples illustrate the usefulness of combining subject-specific content and sustainability aspects with a clear and democratic teaching concept for seminar design at universities. They can thus be anchored and transferred in different ways, as the initial experience gained here has been used and tested in a wide variety of formats and contexts.

REFERENCES


