

Article

Developing ESD Competences in Higher Education Institutions—Staff Training at the University of Vechta

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Abstract: Education for Sustainable Development (ESD) competences have been widely discussed over the past decade. A number of frameworks have been developed, and the Erasmus+ Project “A Rounder Sense of Purpose” (RSP) set out to establish a profound and practical framework of competences to be used in any European context to enable in-service and pre-service educators to demonstrate their competence in ESD. Over the course of two years at the University of Vechta, staff training was provided using the RSP competences model as a guiding framework. Data were collected through a focus group and a self-assessment survey in order to answer the research question, “Which competences do university teachers need in order to work with the concept of ESD in higher education and how can these be developed in a series of staff training workshops?” The results show that all 12 RSP competences are indeed relevant for higher education teaching, but the potential for developing them into a staff training programme is limited. There are multiple trigger points and settings that are beneficial to and necessary for the development of ESD competences. If those conditions are not met there is limited opportunity for applying ESD methods within higher education.

Keywords: education for sustainable development; competences; staff training; higher education

1. Introduction

Within Higher Education Institutions the development of sustainability competences amongst students has become increasingly important over the last 15 years. The focus has largely shifted, from solely input-oriented teaching to a student-centred approach, through the use of so-called competence frameworks [1]. These frameworks suggest different approaches to teaching and learning by incorporating a broader range of different competences that go beyond the purely professional [2]. University teachers in turn also need particular competences in order to work with the concept of Education for Sustainable Development (ESD) in higher education. This article looks at the overall development of ESD competences and the development of ESD in general from a German perspective. A series of staff training sessions were held at the University of Vechta in 2018 and 2019 as part of the wider European Erasmus+ Project “A Rounder Sense of Purpose” (RSP). This project developed an ESD competence framework that is now being tested in the various participating countries [3,4]. The 12 proposed competences from the RSP project were used as guidance when the topics and themes for the staff training at the University of Vechta were planned. After two rounds of training a focus group and self-assessment survey were used to collect data in order to reflect on the competence development of training session participants and to verify the broader necessity of these kinds of sessions. The results indicate the complexity of competence development and the various factors that have an impact on this development; they also highlight the challenges involved with assessing ESD competences.

The sections below start by providing an overview of the state of research on ESD, competence development and ESD competences. The methodology and research process that led to this paper are then described in Section 2. Section 3 describes the results, and the subsequent discussion and conclusion highlight the main learning points, merits, limitations, and outstanding or emerging questions.

1.1. Education for Sustainable Development (ESD)

The discussion about the quality and professionalism of teaching with regard to sustainable development has often been a topic at the political level. The first international discussions about the role of education in the context of sustainable development took place around 40 years ago, but only peaked at the United Nations conference in Rio de Janeiro in 1992. Agenda 21, which was adopted there, officially linked education with sustainable development for the first time.

In 2002 at a conference in Johannesburg and in the context of the United Nations Decade (2005–2014), the United Nations reaffirmed this link and also called for the principles of sustainable education to be embedded in education systems at a global level. Following this, education was introduced as the fourth of the 17 Sustainable Development Goals (SDGs) in the 2030 Agenda as follows: To guarantee inclusive, fair and high-quality education and (to) promote opportunities for lifelong learning for everyone [5]. The aim here is for learners of all ages to develop the necessary competences for contributing to sustainable development by the year 2030 [6].

The German sustainability strategy stresses the importance of young people in the sustainability process. The Federal Government adopted an initial orientation framework for Education for Sustainable Development (ESD) back in 1998. The importance of education for the introduction and implementation of sustainable development as a guiding principle of social action has always been emphasised, supported by funding programmes, and embedded in curricula, examination requirements and educational standards. As a result of this and of the signing of Agenda 21, ESD has become an educational policy guideline for teaching in Germany [7,8].

Sustainable development requires education in all areas: from preschool through school through to adult education. The concept of ESD has been modified over time in line with the relevant policy milestones. Its roots go back to the 1990s, when teaching was based on the principle of environmental education. The specific concept of ESD has been introduced in schools and higher education in more recent years [9].

The aim of ESD is to enable students worldwide to contribute to shaping sustainable development [1]. Its role is to help students to achieve the SDGs by promoting competences and knowledge and thus bringing about the necessary transformation [6]. The ESD concept brings together approaches from environmental education, development education, peace education and political education and relates them to one another. One goal is therefore to clarify complex relationships that are less easily understood when the priorities are considered individually; ESD thus represents a significant development compared with traditional approaches in ecological and developmental education. The focus is no longer on guiding students towards certain attitudes and perspectives, but on presenting different positions and solutions to problems [1,10].

This new perspective means that ESD not only contributes to the achievement of sustainable development, but also promotes and stimulates individual educational processes. These two objectives lead to a tension between students' claim to self-determination on the one hand and political demands for mechanisms to deal with social problems on the other. The resulting challenge is to mediate between social and educational needs, so that consideration of the problems promotes educational processes [11]. Accordingly, ESD needs to enable students to support sustainable change, question positions and clarify open questions. Education has always looked to the future, but it has tended to focus on the future of individuals. In the context of sustainable development, looking to the future means individual action in relation to current and future social and ecological outcomes [12]. These should be reflected on by the students in order to enable them to participate in forward-looking planning. They need to reflect

on individual lifestyles, focusing not only on reducing ecological footprints, but also on commitment to global environmental protection through the preservation of the rainforests or renewable energies, for example. Other tasks of so-called political education include the critical examination of lobbying activity and the analysis of media reports. Students should also be able to take a reflective approach to complex situations [1,13].

The idea of a sustainable world, which ensures the well-being of current and future generations, has developed over time into a global model and is still gaining in importance. Among other things, this has resulted in a social obligation that calls for the cooperation of every single individual to protect the environment, fight poverty and ensure peace and equality. However, individuals' participation in sustainable development varies widely, as a result of a range of factors. One crucial factor is insufficient knowledge about the origin, functions and characteristics of sustainable development.

For this reason, educational institutions have been assigned a key role in embedding the principle of sustainability in society. Without developing certain competences and promoting the necessary learning processes, it will be almost impossible to achieve sustainable development. The educational programmes put in place are intended to promote awareness and change attitudes and perspectives, and to make it possible for students to participate responsibly in building a sustainable world.

There will be greater focus on education for sustainable development in future through additional and extracurricular programmes; these will increase public awareness of sustainability activity. The aim is to give individuals the opportunity to develop their competences in such a way that they not only understand the interrelationships between ecological, economic and socio-cultural structures, but can also make an individual contribution to solving them. They should be able to participate actively in the protection of justice at a global and local level as well as in shaping a world in which future generations can lead a fulfilling life that is free of care. In addition to the relevant specialist knowledge, this also requires the development of sustainability competences [1,14].

1.2. Competence Development

Due to the increasing complexity of social change, the educational goal of ESD is the acquisition of competences [1]. Competences include knowledge, skills, motivation and values systems, and are related to different situations and contexts [15]. Approaches to the development of competence are output-focused and ask students about the competences they think they should achieve. The focus is on students' learning objectives rather than on what teachers should be teaching.

Key competences are those competences that are helpful and of value to all individuals in several areas of life [15]. Relating ESD to the development of key competences, there are a range of proposed structures for sustainability competences [1,16]. This work is based on de Haan's *Gestaltungskompetenz* (shaping competence), which is the most common sustainability competences framework in Germany [8]. *Gestaltungskompetenz* refers to the ability to apply knowledge about sustainable development and to recognise problems relating to unsustainable development. Various key competences reflecting the requirements of modern life and considered necessary to living a just life and shaping sustainable development from local to national level were selected, defined and grouped into three categories. The aim here is for students to acquire different *Gestaltungskompetenz* sub-competences through an intermediate educational qualification. Teachers can use the set of 12 sub-competences below as a guide for lesson planning and assessment [8]:

Interactive use of media and methods:

- Competence to take on new perspectives: ability to build up knowledge with an open mind and new attitudes
- Competence in anticipation: ability to analyse and assess developments with foresight
- Competence in interdisciplinary knowledge acquisition: gaining knowledge and being able to act at an interdisciplinary level
- Competence in dealing with incomplete and overly complex information: recognising and weighing up risks, dangers and uncertainties

Interaction in heterogeneous groups:

- Competence in cooperation: ability to plan and work together with others
- Competence to cope with difficult individual decisions: ability to consider conflicting goals when reflecting on strategies for action
- Competence in participation: ability to participate in collective decision-making and development processes
- Competence in motivation: ability to motivate oneself and others to become active

Acting autonomously:

- Competence to reflect on models: ability to reflect on one's own models and those of others
- Competence in moral action: ability to use ideas of justice as a basis for decision-making and action
- Competence to act independently: ability to plan and act independently
- Competence to support others: ability to show empathy for others

1.3. ESD Competences

Since sustainable development is linked to the independence of the individual, ESD learning environments must encourage self-organised and action-oriented transformative learning in which connections are recognised and students see themselves as part of a whole.

Some of the educational principles of ESD are relevant to independent learning. On the one hand, learning must be vision-oriented and action-oriented; on the other hand, it must include networked, social and self-related learning [6,17]. Learning environments that promote project-based, interdisciplinary and lifeworld-relevant learning are also favoured. They should incorporate group work and present practical problems in authentic situations. ESD can be implemented in formal, non-formal and informal ways.

Informal learning includes everyday experiences. These occur through media use, at work or during leisure time and are viewed as unintentional. As a result, the structures recorded are of great importance for the development of the learner's worldview. Informal learning also occurs in educational situations such as universities. A distinction is made between informal learning processes that on the one hand take place during lectures and on the other hand arise in the course of everyday university life, such as group work or food consumption. As a result, the structure of educational institutions is also part of ESD, which sets out a holistic institutional framework of formal and informal learning environments (Whole Institution Approach) [6], which was also described in the United Nations Organization for Education, Science and Culture (UNESCO) Global Action Program for ESD [18]. In order to turn universities into models of a sustainable way of life, their structure and management need to be incorporated into the sustainable development model. In addition to lectures and aspects of management, the focus is on the democratic division of tasks, provision of programmes to complement lectures, cooperation and partnerships, quality development and assessment, and structural design and equipment [19].

The development of sustainability competences requires a range of methods and educational approaches. External learning environments, encounters with animals and nature, experiments and games can be cited here as examples and are well suited to the development of networked, alternative thinking. The following methods also reflect ESD requirements: project work and environmental exploration, open lessons and free work, scenic play and simulation games, discussion and teamwork methodologies, future workshops and evaluation methods [20]. Intercultural contexts can be created to enable the exploration of alternative perspectives and reflection on different worldviews. Applying knowledge in different contexts and assessing problems from different perspectives promotes flexibility of understanding. Among other things, the learning that results from this activates students and is brought into focus by ESD's prioritisation of the acquisition of competences. Student evaluation of their own learning strategies and processes is also particularly important [20].

In order for students to be prepared to take on responsibility and help to transform society, they need to acquire specialist knowledge and competences. However, the topics that enable such competences to be learned are not arbitrary. Content can be selected in particular from the challenges of global change and the SDGs [10].

Thus, achieving a socially and environmentally sustainable form of development has implications for what is taught in our schools and the way in which education is conducted. This highlights the need for teachers with the competences and motivation to provide their learners with education for sustainable development. ESD-related innovations in teaching and learning require new competences on the part of teachers [21,22]. In order for teachers to be able to implement the concept of Education for Sustainable Development in a professional manner and to take an appropriate approach both to content and to method, they need to develop key sustainability competences, such as *Gestaltungskompetenz*. In addition to general sustainability competences, they also need ESD competences, which can be described as the ability to support learners in developing sustainability competences through a range of innovative teaching and learning practices. Teachers must have a critical understanding of sustainable development on the one hand and the pedagogical approach of ESD on the other. They need knowledge of innovative teaching and learning methods, but also the skills to apply them. They also need the skills to support their learners—e.g., with projects—which involves critical reflection on one's own role as a teacher and seeing oneself more as a learning guide. Elements of such ESD competences are described in detail in the various conceptual frameworks for teacher competences in ESD: the CSCT-model [23], the UNECE model [24], the COM-BiNE model [25,26] and the approach of Bertschy et al. [21] (for a systematic review of the ESD competences frameworks see [27]).

These different conceptual frameworks for ESD competences have barely been tested with teachers or students and there are no measurable learning outcomes that could underpin a qualification in ESD. Against this background, the European project 'A Rounder Sense of Purpose' (RSP) set out to plug this gap by:

- Developing a practical framework of competences for use in any European context so that in-service and pre-service educators can demonstrate their competence in ESD
- Developing tools and guidelines to help teacher educators implement the framework in a wide variety of contexts

A Rounder Sense of Purpose—which entered Phase II in September 2018—developed a framework that describes 12 ESD competences for educators. The idea was to distil the UNECE competences by refining and filtering it and extracting essential elements [3,4]. These 12 ESD competences can be divided into four subgroups: integration, involvement, practice and reflexivity. Table 1 presents these 12 competences. Each competence encompasses three learning outcomes, including several supporting components. RSP gives a comprehensive overview of what “ESD competence” means.

To enable teachers to develop these competences, they must be given the opportunity to participate in appropriate teacher training. This raises the question of how effective teacher training is in relation to the concept of education for sustainable development. Despite the increasing importance of sustainability, the concept of education for sustainable development is implemented differently at different universities: while some universities have made the topic their guiding principle, other universities only offer individual courses. Still others incorporate sustainable development through modules or integrate sustainability-related topics into individual sessions on an optional basis [29]. Many challenges continue to prevent the holistic establishment of the concept of sustainability at universities. However, the topic is too diverse and not yet sufficiently researched to allow for the development of specific suggestions for improvement in future [30].

Against this backdrop, the A Rounder Sense of Purpose' ESD competences framework is applied and validated in a range of educational settings in Cyprus, Germany, Hungary, Italy, Spain, Switzerland, and the UK. In Germany the model is used as a framework for a series of staff training workshops at the University of Vechta. Based on the application of the model at University of Vechta,

this paper particularly asks: Which competences do university teachers need to have in order to work with the concept of ESD in higher education and how can these be developed in a series of staff training workshops?

Table 1. A Rounder Sense of Purpose (RSP) competence framework [28].

<i>Thinking Holistically</i>	<i>Envisioning Change</i>	<i>Achieving Transformation</i>
<i>Integration:</i>		
Systems The educator helps learners to develop an understanding of the world as an interconnected whole and to look for connections across our social and natural environment and consider the consequences of actions.	Futures The educator helps learners to explore alternative possibilities for the future and to use these to consider how behaviours might need to change.	Participation The educator helps learners to contribute to changes that will support sustainable development.
<i>Involvement:</i>		
Attentiveness The educator helps learners to understand fundamentally unsustainable aspects of our society and the way it is developing and increases their awareness of the urgent need for change.	Empathy The educator helps learners to respond to their feelings and emotions and those of others as well as developing an emotional connection to the natural world.	Values The educator develops an awareness among learners of how beliefs and values underpin actions and how values need to be negotiated and reconciled.
<i>Practice:</i>		
Transdisciplinarity The educator helps learners to act collaboratively both within and outside of their own discipline, role, perspectives and values.	Creativity The educator encourages creative thinking and flexibility within their learners.	Action The educator helps the learners to take action in a proactive and considered manner.
<i>Reflexivity:</i>		
Criticality The educator helps learners to evaluate critically the relevance and reliability of assertions, sources, models and theories.	Responsibility The educator helps learners to reflect on their own actions, act transparently and to accept personal responsibility for their work.	Decisiveness The educator helps the learners to act in a cautious and timely manner even in situations of uncertainty.

2. Materials and Methods

As described in Section 1.2, the RSP framework consists of twelve “pedagogical competences”, i.e., competences that can be used as a basis for training programmes and/or for the assessment of educators who wish to improve their ability to contribute to Education for Sustainable Development (ESD).

The second phase of the project (2018–2021) contains a strong action research [31–33] element that explores the related areas of the development and assessment of concepts by analysing the complexity involved. A series of staff training workshops were held at the University of Vechta in summer 2018 and during the 2019 summer term. These introduced university teachers to the concept of ESD and enabled them to develop ESD competences based on the RSP framework. The design of the training programme also reflected the principles of ESD (in particular interdisciplinary learning, discovery learning, participation focus, future focus, and action and reflection focus) and enabled participants to engage actively with the concepts of sustainability and ESD and to experience ESD itself. In the context of the RSP framework, the training programme was thus designed to promote the development of ESD competences among teachers. In 2018, the following workshops were offered: 31 May, “Introduction to

ESD & application in teaching—what is it about and what does the concept have to do with me and my teaching?” (Prof. Dr. Heike Molitor, HNE Eberswalde); 15 June, “Method overview & teaching techniques in ESD—what can be used how and with which goals?” (Prof. Dr. Sandra Sprenger, Universität Hamburg); 2 July, “How does the scenario technique work? Targeted examination of the method”. (Dr. Simon Burandt, Leuphana Universität Lüneburg). In 2019, the following workshops were offered: 27 March, “Introduction to ESD” (Prof. Dr. Ute Stoltenberg, Leuphana Universität Lüneburg); 24 April, “ESD pedagogy” (Prof. Dr. Matthias Barth, Leuphana Universität Lüneburg); 27 May, “Futures studies methods—How to use the future in your class” (Senan Gardiner, University of Vechta); 19 June: workshop on “Applied interdisciplinary learning around Education for Sustainable Development” (Prof. Dr. Paul Warwick, Plymouth University), and 11 July: workshop on “Service learning” (Dr. Petra Biberhofer and Prof. Dr. Christoph Schank, University of Zürich and University of Vechta). Each of the workshops was attended by about 10–15 professors, lecturers and student teachers. A total of 30 different participants attended the staff training workshops over the course of these two years.

In October 2019, we held a focus group [34–38] with six participants of the staff training workshops, addressing the following questions, for example: What have you taken from the ESD training programme? What is your general opinion of the RSP competence framework? The complete list of questions is presented in Appendix A. The focus group was transcribed and the content subjected to abductive analysis [39] within MAXQDA.

The second part of the data collection was a self-evaluation and feedback survey for the participants in the training workshops. This survey took place between May and June 2020; a total of 26 individuals were invited to respond and 9 did so. Figure 1 shows some of the questions asked in the online survey. The complete questionnaire can be found at Appendix B. The central focus of the self-assessment survey was to investigate whether the training programme had promoted the development of the 12 competences from the RSP competence framework amongst the participants.

Competencies acquired (integration and inclusion)

By attending the ESD training series, I was able to develop my skills in the following areas ...	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Systems thinking (this enables me to help learners to develop an understanding of the world as an interconnected whole and to look for connections across our social and natural environment and consider the consequences of actions)	☐	☐	☐	☐	☐
Futures (this allows me to help learners to explore alternative possibilities for the future and to use these to consider how behaviours might need to change)	☐	☐	☐	☐	☐
Participation (this allows me to help learners to contribute to changes that will support sustainable development)	☐	☐	☐	☐	☐
Attentiveness (this enables me to help learners to understand fundamentally unsustainable aspects of our society and the way it is developing and increases their awareness of the urgent need for change)	☐	☐	☐	☐	☐
Empathy (this allows me to help learners to develop their self-awareness and their awareness of others)	☐	☐	☐	☐	☐
Values (This allows me to help learners to work responsively and inclusively with others, remaining aware of their personal beliefs and values)	☐	☐	☐	☐	☐

Competencies acquired (practice and reflection)

By attending the ESD training series, I was able to develop my skills in the following areas ...	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Transdisciplinarity (this allows me to help learners to act collaboratively both within and outside of their own discipline, role, perspectives and values)	☐	☐	☐	☐	☐
Creativity (this allows me to encourage creativity and flexibility within the learners)	☐	☐	☐	☐	☐
Action (this allows me to help learners to take action in a proactive and considered manner)	☐	☐	☐	☐	☐
Criticality (this allows me to help learners to evaluate critically the relevance and reliability of assertions, sources, models and theories)	☐	☐	☐	☐	☐
Responsibility (this allows me to help learners to act transparently and to accept personal responsibility for their work)	☐	☐	☐	☐	☐
Decisiveness (This enables me to help learners to act in a cautious and timely manner even in situations of uncertainty)	☐	☐	☐	☐	☐

Figure 1. Section of the self-assessment survey (own creation).

3. Results

The results can be divided into two parts. Part one looks at the outcomes of the focus group, which investigated four sections/themes. Firstly, it examined the learning from the ESD training programme and considered what further improvements and development the programme might need.

The second set of questions looked at the RSP competence framework and its pros and cons. A third area of questions was dedicated to the application of ESD methods within teaching, as a result of what had been learned during the training programme. The fourth and last section explored the options for assessing ESD-related learning outcomes. The second part of the results presents the findings of the self-assessment survey.

3.1. Focus Group Results

3.1.1. Staff Training Outcomes

There was discussion of values and deconstruction of ESD; as one focus group interviewee said: “Well, this follows on from the last topic, in fact, the discussion of values, [...], where ESD was once deconstructed in this way, and it also goes back to human rights and human dignity [...]”. Some saw the staff training course more as a knowledge acquisition exercise, where there was a lack of development of tools/competences due to lack of time. “In my case it was more about knowledge, so if there were individual tools, individual methods, [...], I would have to look at the documents again, because I might have forgotten one or two, but there were also points that I found exciting from a knowledge perspective. I wouldn’t say direct competence development yet, because it’s questionable whether a 3-h workshop can really make a contribution to competence development, [...]”.

Another aspect raised was how far participants could assess their own competence development. “Unfortunately, I think I have to say that I can’t judge to what extent, yes, this actually benefitted me [...]”. One interviewee even questioned the ability of the sessions to develop competence without participants giving over more time to personal reflection and spending more time on further training. “That’s right, I would definitely see it that way, I think methodologically speaking it provided a good overview, I mean a fairly in-depth insight into the methods I found that we actually had enough time for that, and then the question would be what comes out if it that you can continue working with, [...] that you can train yourself to apply. I can imagine that one or the other of these competences could be further promoted”.

3.1.2. RSP Competence Framework: Pros and Cons

When the question of the usability of the RSP competence framework arose, discussion did not focus on the strengths and weaknesses of the framework but went in a number of directions. One area of focus was the complexity of the various competences and the inability of the training sessions to provide participants with the guidance and knowledge necessary to improve any given competence over only three to four hours. “[...] you can’t even learn that in two hours, you really have to have a lot of practical competence, methodological competence and I don’t think that’s something you can necessarily expect of every teacher, not at this level anyway—every teacher can develop a certain capacity for forward thinking [...]”. One interviewee highlighted that all the competences were quite logical in themselves and that they did not contradict each other, but the same individual said that “almost every one of these competences requires a decidedly subject-focused introduction, and not topic-based approach, but rather one that starts with a problem, or is situated in the living environment”. Another of the concerns about the twelve competences that provoked discussion was the question of under-reflected normativity; when talking about values, for example, the following questions arose: “What makes values values?”, “How do I assess this?”, “Which values are we talking about?”. Participants in this focus group found it difficult to identify whether there were missing competences or whether there were a few too many. These competences were said to be “free of contradiction” and were all deemed “relatable”.

3.1.3. Applicability of ESD Methods within Teaching

After discussing the pros and cons of the framework, participants were asked whether there were methods that they thought that they would be able to deploy in their teaching, or that they were already using. Overall, discussion of this question yielded three main insights:

- (1). Some of the training sessions had no clear common theme and showed no evidence of a specific method or approach
- (2). Sometimes the time had passed too quickly, so it was difficult for participants to remember specific methods that they could use
- (3). Some specific methods were mentioned: teachers had either modified these to apply them or had given some thought to how to apply them

3.1.4. Assessing Learning in Accordance with RSP Competences Framework

One of the main arguments during focus group discussion was the lack of appropriate assessment formats “[...] because the thought occurred to me that it is of course actually difficult for teachers because the formats don’t really exist, so we don’t have put students through any kind of competence-based examination, and not all, but some of the competences could perhaps even be tested in written exams, not necessarily through ticked-off tasks, but perhaps through open answer formats [...]”.

Elsewhere, participants noted that there was no requirement for further training and no support for life-long learning. In other cases where support was available for life-long learning, it was not appreciated. “Not only is there no examination, in some cases there isn’t even a requirement to participate in further training, [...]”.

Another interviewee highlighted that the sharing of information and knowledge is quite different in schools, where there is are regular opportunities to exchange ideas and so forth, compared with universities. “And, to stay with the idea of this kind of school, I don’t know how it works nowadays, but you have a staff room, which is another context where you can exchange ideas about what works and what doesn’t, and where methods and questions of pedagogy are probably at the centre of discussion, and that usually doesn’t happen at university”.

Finally, the question was raised as to whether collaborative team teaching is essential for improving the development of different competences. “But I find the idea very exciting, because as I just said, somehow there are no formats where there is, well, no measurement; but I was just thinking about team teaching formats, which I have also been part of in the past, sometimes here too, but personally I would say that I learned the most about [...] forward thinking and how to promote it when I gave seminars alongside a colleague who was simply a long way ahead of me”.

3.2. Results of Self-Assessment Survey

Tables 2 and 3 look at participants’ expectations and the reasons they participated in the workshops in the first place. The numbers in brackets indicate the amount of times this statement was made. Afterwards the results of the self-assessment are presented by looking at the individual competences. The highlighted competences are those that were perceived to have better learning outcomes.

Table 2. Reasons for participation in staff training workshops.

Reason for Participation
• Personal interest in content (3)
• Stimuli for higher education teaching techniques and building competences (3)
• ESD is an important issue (2)
• Learn about new methods/new ideas (2)
• Discussion of relevant sustainability policy issues with experts
• Opportunity to exchange ideas with other teachers
• Because it is also thematically addressed in teaching (ESD week)
• Education for sustainable development is a cross-cutting issue that is gaining in relevance for a growing number of disciplines. It is assumed that at least the social sciences will need to deal with it more closely in the future.

Table 3. Participants' expectations prior to staff training workshops.

Participants' Expectations
• Learning about new teaching methods and their suitability; how to use them appropriately (4)
• Tips and knowledge for practical application/teaching (3)
• Implementation of the 17 Sustainability Development Goals
• Discussion of policy issues in the context of sustainability

A number of themes emerge from Table 1. Some participants wanted to learn new methods and learn about their application in the learning environment. Others were interested in the ESD as an issue of general importance; exchanging ideas with others was also important to participants.

Expectations were similar to the reasons given for participating in the training workshops. The major expectations related to knowledge acquisition and learning how to apply methods, but there was also expectation of discussion of policy issues and implementation of the SDGs.

The figures below demonstrate the learning process and competence development regarding the 12 competences of the RSP framework. These 12 competences can be divided into four subcategories:

- Integration competences (Systems, Futures, Participation)
- Involvement competences (Attentiveness, Empathy, Values)
- Practice competences (Transdisciplinarity, Creativity, Action)
- Reflection competences (Criticality, Responsibility, Decisiveness)

The horizontal axis of the subsequent figures (Figures 2–5) shows the different competences. The vertical axis shows the ratings of the different competence developments, from 1 being “strongly disagree” to 5 being “strongly agree”. Looking at the first subcategory, integration competences, it can be said that participants' self-assessment indicates that the systems and participation competences were developed by the training programme. Only one participant indicated “strongly disagree” in the survey. However, this participant gave this response throughout the entire survey. Therefore, that participant showed no development of any competences across the programme as a whole. The mean scores were 3.67 for the systems competence, 3.11 for the futures competence and 3.56 for the participation competence.

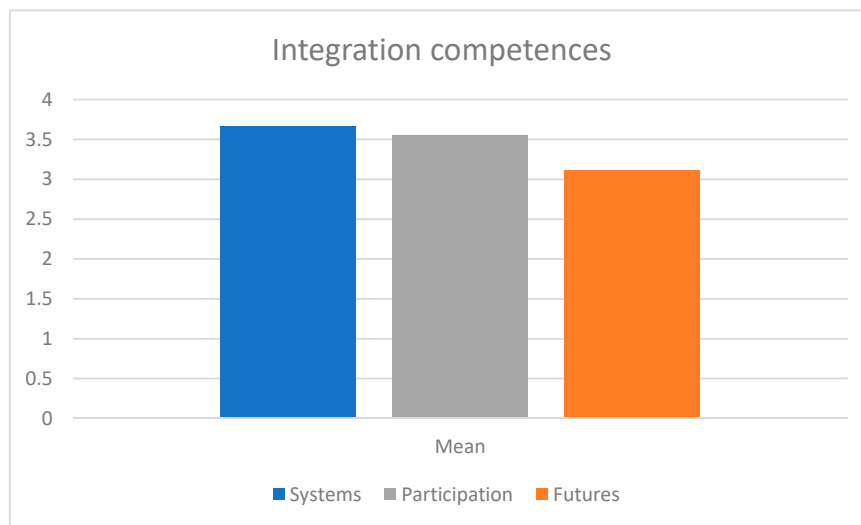


Figure 2. Development of integration competences (own creation).

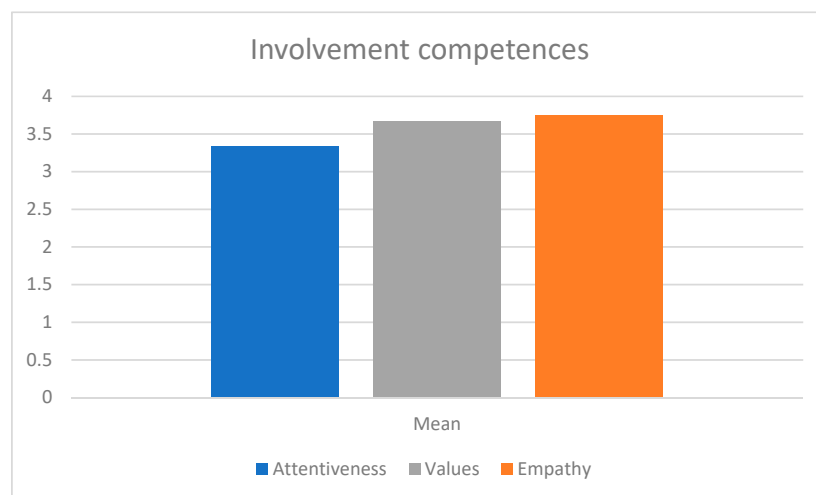


Figure 3. Development of involvement competences (own creation).

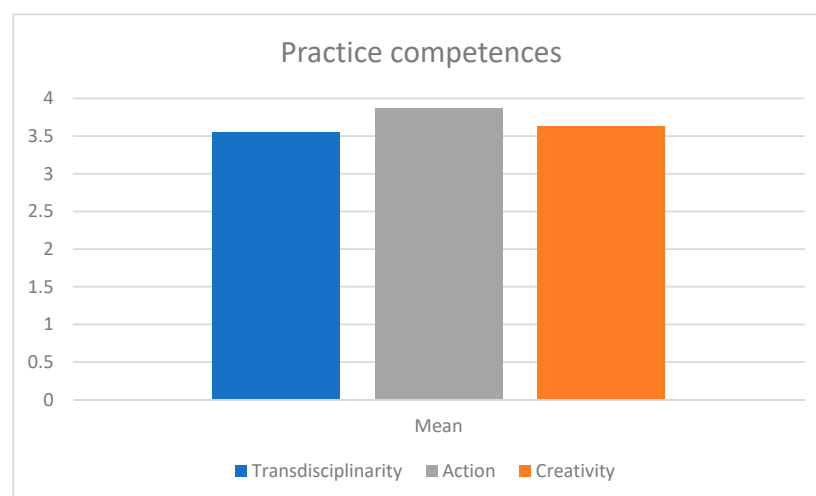


Figure 4. Development of practice competences (own creation).

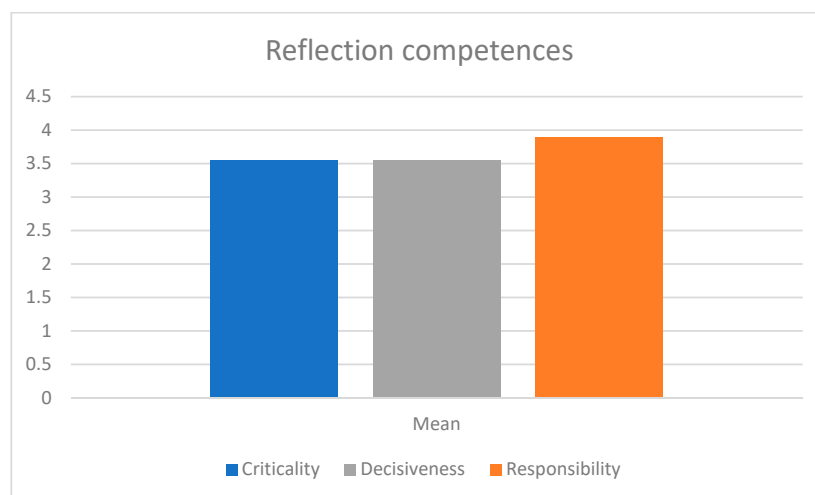


Figure 5. Development of reflection competences (own creation).

The second subcategory, involvement competences, showed high numbers for empathy and values competences. The development of empathy skills, apart from one person, who was not able to judge this question, was ranked especially high, with a mean score of 3.75. The values competence had a mean score of 3.67 and the attentiveness competence a mean of 3.33.

The third subcategory, practice competences, generally showed high scores for all three competences, ranging from a 3.88 mean for action, to a 3.63 mean for creativity, to 3.56 for transdisciplinarity.

The final subcategory, reflection competences, had the highest mean with the responsibility competence at 3.89. The other two competences, namely criticality and decisiveness, both had a mean of 3.56.

Overall, it can be said that self-assessment by teachers of the development of their competences provided one significant insight: none of the average means was above 4 ("agree") or below 3 ("undecided"). It is thus not clear whether the training programme had an impact on all participants. There was certainly some impact on some participants, but the results do not indicate why other respondents felt there had been no significant development in their competences. Figure 6 illustrates the mean values for all nine respondents in relation to the twelve competences.

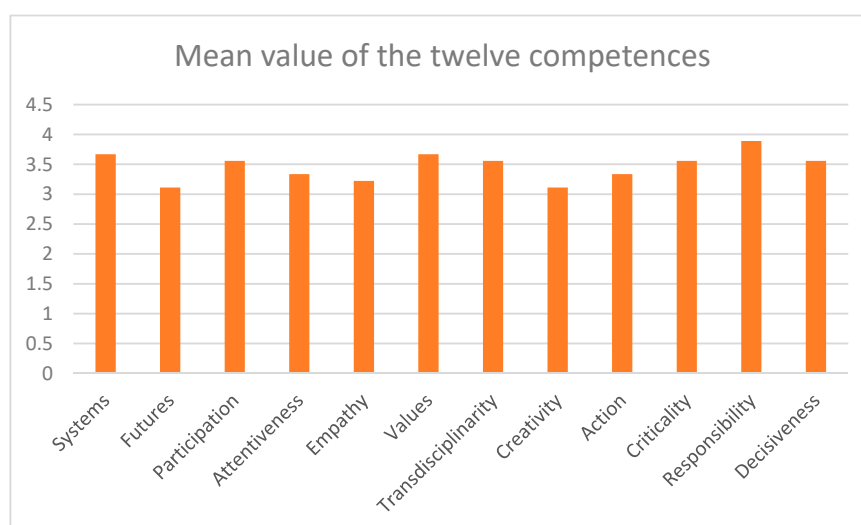


Figure 6. Mean value of RSP-competences (own creation).

4. Discussion

Analysis of the results and of the theoretical and practical approaches taken by the German education system demonstrate the relevance of ESD training sessions for educators within the higher education sector. According to Filho et al. [40] and Cebrián and Junyent [29] high importance needs to be given to the discussion of values, understanding the complexity of systems and thinking outside the box, all with a focus on the future. Another critical aspect for staff training programmes is multiple perspectives. Focusing solely on knowledge acquisition means that the other perspectives (“learn to live together, learn to do and learn to be” [23]) are left out and the emerging picture is biased and not holistic (and the “learn to be” perspective is already less focused in the ESD competences frameworks themselves [27]). This picture is also reflected in the outcomes of the focus group, where it was stated that all the proposed competences were relatable and interlinked; competences should not therefore be seen as the acquisition of knowledge in separate areas. This was supported by the self-assessment survey results, where no single competence was more prominent than the others, as highlighted in Figure 6. The focus group discussion also emphasised that all 12 RSP competences were important and relatable, and concluded that there was no competence missing from the framework. The results of the self-assessment survey and the focus group thus in theory validate the RSP framework. In practice, however, there is a completely different picture when it comes to its applicability. In line with Barth and Rieckmann [41] who emphasise that ESD academic staff development can be a catalyst for curriculum change, this survey demonstrates that these training programmes can trigger change at a variety of levels: individual competence development, professional performance and in organisations. These results highlight the importance of such training but also the commitment of the participants. Therefore, in the case of the University of Vechta trainings, there was positive feedback overall on the training programme and on the knowledge provided by the programme of sustainable development, ESD and ESD-related methods. However, there are some limitations to this research and the training sessions, the first being the low number of respondents and participants. ESD is only of interest to individuals that are already dedicating their work to this topic or showing a greater interest in this research field. There is a lack of commitment and no demand of any kind for further training amongst teachers and higher education lecturers. Second, critical reflection is needed on the opportunities that such 3–4 h workshops offer for competence development. To develop the complex competences required for ESD, deeper learning processes are necessary, and these require more time [15,42]. For this reason, staff training workshops can only provide the stimulus for such competence development. Third, the question of self-assessment and whether it reflects the anticipated results has to be questioned. The potential of self-assessment in relation to competences is rightly discussed critically in the literature [43,44]. Fourth, the question of how competences such as values, empathy and creativity can be assessed (the current forms of assessment mean this is not feasible or manageable) remains open [4,45].

5. Conclusions

Looking again at the research question, the following conclusions can be drawn. The first part of the research question aimed to identify the competences university teachers need in order to work with the concept of ESD in higher education. There are two approaches to providing an answer to this question:

- (1). All of the twelve ESD competences are to a certain extent interrelated and therefore all require considerable attention.
- (2). There needs to be a fundamental discussion on the underlying premises of the twelve competences, and their viability/sustainability in the long run.

The goal of the second part of the research question was to find out whether a series of staff training workshops could develop these kinds of competences. Referring to the literature and the results of the focus group, the most that can be said is that such workshops can act a trigger, highlighting

certain aspects of the competences and providing guidance as to where and how they can be further developed. However, they are not an appropriate instrument for learning, since a deeper and more reflective process is required to develop the competences themselves. Some of the insights from the analysis of the focus group show that at the University of Vechta it can be difficult to implement new ESD methodologies—due to lack of time, limited flexibility in what is taught, and the general conditions relating to seminars. Another point worthy of consideration is the attractiveness of staff development workshops: they were attended mainly by professors, lecturers and teacher students with a high personal interest in ESD. A question that arises is therefore how to attract teachers who are less familiar with and/or uninterested in ESD to such workshops in order to have a greater impact on higher education.

To better understand these processes and to further support the integration of ESD in higher education, it is important to integrate ESD structures and content across of all areas of the university. This will ensure that research activities at universities generate knowledge that can make an important contribution to shaping sustainable development. Education for sustainable development at universities needs to be understood as a “Whole Institution Approach”: a holistic, open, accessible and reflective process that all can participate in. Universities should approach ESD content, methods and principles theoretically, conceptually and methodologically, but above all critically and reflexively. Students are key stakeholders since they are network initiators and visionaries and can thus mobilise the potential of universities to develop a sustainable outlook. The “Whole Institution Approach” thus encompasses not only the core areas of teaching and research but also the operation of universities, enabling them to become authentic places of learning.

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Appendix A

KEY QUESTIONS FOR FOCUS GROUP

INTRODUCTION

For moderators:

Introduce all participants or give them the opportunity to introduce themselves

Outline the goal and purpose of the focus group

Ask if you can record the discussion

Let them know that all data will be used anonymously and that the data will be treated confidentially

1. INPUT QUESTIONS

- You have participated in one or more events / workshops in the ESD staff training programme. What do you remember particularly from these events / workshops?
- Imagine you were in charge and could make a change that would improve the ESD training programme. What would you / would you do?
- (How familiar are you with the RSP Competences Framework?)
- We sent you a competence framework in advance. This was developed in the "A Rounder Sense of Purpose" project and describes competences that teachers need in order to work with ESD. What do you like best about the RSP Competences Framework? In your opinion, what should be changed?

2. INQUIRIES

Question	Inquiry	In-depth question
What did you take away from the ESD training programme?	What did you learn? What was new for you?	What knowledge did you acquire? What skills have you developed?



Question	Inquiry	In-depth question
Consider the twelve different competences listed in the RSP Competences Framework: What is your general assessment, how you feel in relation to the competence framework?	Are there competences that you consider to be less important for working with the ESD concept? if so, which are they and why? Are any skills that you consider important for working with the ESD concept missing? if so, which are they and why?	Thinking of the most recent ESD education session that you attended here at the university, which ESD methods have you used since then and which ESD-related competences have you developed since then?

Question	Inquiry	In-depth question
How can the development of the various learning outcomes be assessed in terms of the RSP competence framework?	How can the development of competences be recorded or measured? Do you have any comments about the survey on the competence development?	Which type(s) of analysis is / are particularly suitable for mapping skills acquisition?

3. FINAL QUESTIONS

- Which competences should still be promoted as part of the ESD training programme? Do you have specific suggestions for future content of the ESD training programme?
- Of all the things we've discussed, what is the most important to you?
Would you like to comment on the RSP Competences Framework?

CHECK OUT

For moderators:

Provide an overview of what will be done with the results of the focus group

Describe the next steps in the project and invite you to the subsequent RSP training sessions and to complete the self-evaluation competence assessment

Thank you for your time and openness!

Appendix B

Self-assessment and evaluation of the ESD training programme

Dear participants,

This questionnaire is an important tool to further improve the quality of the training sessions. The results are primarily intended to provide us with feedback. The provision of answers to individual questions or all questions is entirely voluntary. By completing the questionnaire, you give your consent to the automated evaluation of the data.

The questions relate to you as a participant (learning success and competence development). There are no wrong answers. Your data will of course be evaluated on a completely anonymous basis. We would like to know why you decided to participate in ESD training and how satisfied have been with this programme so far. We are particularly interested in the competences you have acquired as a result of attending the training programme.

Please provide details only insofar as they relate to your attendance of the workshops. If you have the competences or are familiar with the information mentioned but have acquired them elsewhere (e.g. in other training courses or studies), please select "not applicable".

Thank you for your participation!

Marco Rieckmann, Mara Bauer and Lukas Scherak

Personal Information

Personal details

Which group do you belong to? I am a:

- ☐ Professor
- ☐ Research assistant or lecturer
- ☐ Staff member in the technical and administrative department (MTV)
- ☐ Student
- ☐ Representative of an external institution / Other: _____

Reasons for participating in the ESD training programme and expectations of it

Why did you decide to participate in the ESD training series?

.....

.....

What expectations did you have in advance of the ESD training series?

.....

.....

Have your expectations been met?

- ☐ completely fulfilled
- ☐ largely fulfilled
- ☐ partially fulfilled
- ☐ not fulfilled

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Competencies acquired (integration and inclusion)

By attending the ESD training series, I was able to develop my skills in the following areas ...	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Systems thinking (this enables me to help learners to develop an understanding of the world as an interconnected whole and to look for connections across our social and natural environment and consider the consequences of actions)	☐	☐	☐	☐	☐
Futures (this allows me to help learners to explore alternative possibilities for the future and to use these to consider how behaviours might need to change)	☐	☐	☐	☐	☐
Participation (this allows me to help learners to contribute to changes that will support sustainable development)	☐	☐	☐	☐	☐
Attentiveness (this enables me to help learners to understand fundamentally unsustainable aspects of our society and the way it is developing and increases their awareness of the urgent need for change)	☐	☐	☐	☐	☐
Empathy (this allows me to help learners to develop their self-awareness and their awareness of others)	☐	☐	☐	☐	☐
Values (This allows me to help learners to work responsively and inclusively with others, remaining aware of their personal beliefs and values)	☐	☐	☐	☐	☐

Competencies acquired (practice and reflection)

By attending the ESD training series, I was able to develop my skills in the following areas ...	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Transdisciplinarity (this allows me to help learners to act collaboratively both within and outside of their own discipline, role, perspectives and values)	☐	☐	☐	☐	☐
Creativity (this allows me to encourage creativity and flexibility within the learners)	☐	☐	☐	☐	☐
Action (this allows me to help learners to take action in a proactive and considered manner)	☐	☐	☐	☐	☐
Criticality (this allows me to help learners to evaluate critically the relevance and reliability of assertions, sources, models and theories)	☐	☐	☐	☐	☐
Responsibility (this allows me to help learners to act transparently and to accept personal responsibility for their work)	☐	☐	☐	☐	☐
Decisiveness (This enables me to help learners to act in a cautious and timely manner even in situations of uncertainty)	☐	☐	☐	☐	☐

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How satisfied were you with the overall ESD training opportunities?

- ☐ very satisfied
- ☐ fairly satisfied
- ☐ not very satisfied
- ☐ not at all satisfied

What did you particularly like?

What did you not like? Where do you see room for improvement?

Other remarks:

Thank you for your participation!

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References

- Rieckmann, M. Chapter 2—Learning to transform the world: Key competencies in ESD. In *Issues and Trends in Education for Sustainable Development*; Leicht, A., Heiss, J., Byun, W.J., Eds.; UNESCO: Paris, France, 2018; pp. 39–59, ISBN 978-92-3-100244-1.
- Rieckmann, M. Education for Sustainable Development in Teacher Education. An International Perspective. In *Environmental Education*; Lahiri, S., Ed.; Studera Press: Delhi, India, 2019; pp. 33–48.
- Vare, P. A Rounder Sense of Purpose: Developing and assessing competences for educators of sustainable development. *Form@re* **2018**, *18*, 164–173.
- Vare, P.; Arro, G.; De Hamer, A.; Del Gobbo, G.; De Vries, G.; Farioli, F.; Kadji-Beltran, C.; Kangur, M.; Mayer, M.; Millican, R.; et al. Devising a Competence-Based Training Program for Educators of Sustainable Development: Lessons Learned. *Sustainability* **2019**, *11*, 1890. [CrossRef]
- United Nations. Transforming Our World: The 2030 Agenda for Sustainable Development. 2015. Available online: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E (accessed on 30 October 2020).
- UNESCO. Education for Sustainable Development Goals. In *Learning Objectives*; UNESCO: Paris, France, 2017. Available online: <http://unesdoc.unesco.org/images/0024/002474/247444e.pdf> (accessed on 30 October 2020).
- de Haan, G. The BLK ‘21’ programme in Germany: A ‘Gestaltungskompetenz’-based model for Education for Sustainable Development. *Environ. Educ. Res.* **2006**, *12*, 19–32. [CrossRef]
- de Haan, G. The development of ESD-related competencies in supportive institutional frameworks. *Int. Rev. Educ.* **2010**, *56*, 315–328. [CrossRef]
- UNESCO—United Nations Educational, Scientific and Cultural Organization. *Shaping the Future We Want. UN Decade of Education for Sustainable Development (2005–2014); Final Report*; 2014. Available online: <https://sustainabledevelopment.un.org/content/documents/1682Shaping%20the%20future%20we%20want.pdf> (accessed on 30 October 2020).
- Rieckmann, M. Chapter 3—Key themes in education for sustainable development. In *Education on the Move. Issues and Trends in Education for Sustainable Development*; Leicht, A., Heiss, J., Byun, W.J., Eds.; UNESCO: Paris, France, 2018; pp. 61–84, ISBN 978-92-3-100244-1.
- Vare, P.; Scott, W. Learning for a Change: Exploring the Relationship between Education and Sustainable Development. *J. Educ. Sustain. Dev.* **2007**, *1*, 191–198. [CrossRef]
- Gardiner, S.; Rieckmann, M. Pedagogies of Preparedness: Use of Reflective Journals in the Operationalisation and Development of Anticipatory Competence. *Sustainability* **2015**, *7*, 10554–10575. [CrossRef]

13. Schank, C.; Rieckmann, M. Socio-economically Substantiated Education for Sustainable Development: Development of Competencies and Value Orientations between Individual Responsibility and Structural Transformation. *J. Educ. Sustain. Dev.* **2019**, *13*, 67–91. [CrossRef]
14. Brundiers, K.; Barth, M.; Cebrián, G.; Cohen, M.; Diaz, L.; Doucette-Remington, S.; Dripps, W.; Habron, G.; Harré, N.; Jarchow, M.; et al. Key competencies in sustainability in higher education—Toward an agreed-upon reference framework. *Sustain. Sci.* **2020**, *4*, 1–17. [CrossRef]
15. Rieckmann, M. Future-oriented higher education: Which key competencies should be fostered through university teaching and learning? *Futures* **2012**, *44*, 127–135. [CrossRef]
16. Lozano, R.; Merrill, M.; Sammalisto, K.; Ceulemans, K.; Lozano, F. Connecting Competences and Pedagogical Approaches for Sustainable Development in Higher Education: A Literature Review and Framework Proposal. *Sustainability* **2017**, *9*, 1889. [CrossRef]
17. Mindt, L.; Rieckmann, M. Developing competencies for sustainability-driven entrepreneurship in higher education: A literature review on teaching and learning methods. *Teoría Educ. Rev. Interuniv.* **2017**, *29*, 129–159.
18. United Nations Educational Scientific and Cultural Organization (UNESCO). *Roadmap for Implementing the Global Action Programme on Education for Sustainable Development*; UNESCO: Paris, France, 2014. Available online: https://en.unesco.org/sites/default/files/roadmap_1.pdf (accessed on 30 October 2020).
19. Leal Filho, W. (Ed.) *Sustainability at Universities: Opportunities, Challenges and Trends*; Peter Lang Scientific Publishers: Frankfurt, Germany, 2010; ISBN 978-3-631-59690-6.
20. Leal Filho, W.; Shiel, C.; Paço, A.; Mifsud, M.; Avila, L.V.; Brandli, L.L.; Molthan-Hill, P.; Pace, P.; Azeiteiro, U.M.; Vargas, V.R.; et al. Sustainable development goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *J. Clean. Prod.* **2019**, *232*, 285–294. [CrossRef]
21. Bertschy, F.; Künzli, C.; Lehmann, M. Teachers' Competencies for the Implementation of Educational Offers in the Field of Education for Sustainable Development. *Sustainability* **2013**, *5*, 5067–5080. [CrossRef]
22. Timm, J.-M.; Barth, M. Making education for sustainable development happen in elementary schools: The role of teachers. *Environ. Educ. Res.* **2020**, 1–17. [CrossRef]
23. Sleurs, W. *Competencies for ESD (Education for Sustainable Development) Teachers. A Framework to Integrate ESD in the Curriculum of Teacher Training Institutes*; Comenius 2.1 Project; CSCT: Brüssel, Belgium, 2008. Available online: http://www.unece.org/fileadmin/DAM/env/esd/inf.meeting.docs/EGonInd/8mtg/CSCT%20Handbook_Extract.pdf (accessed on 30 October 2020).
24. United Nations Economic Commission for Europe (UNECE). *Learn. Future: Competences in Education for Sustainable Development*. 2012. Available online: http://www.unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf (accessed on 30 October 2020).
25. Rauch, F.; Steiner, R.; Streissler, A. Kompetenzen für Bildung für nachhaltige Entwicklung von Lehrpersonen: Entwurf für ein Rahmenkonzept. In *Kompetenzen der Bildung für Nachhaltige Entwicklung. Operationalisierung, Messung, Rahmenbedingungen, Befunde*; Bormann, B., de Haan, G., Eds.; VS Verlag: Wiesbaden, Germany, 2008; pp. 141–158.
26. Rauch, F.; Steiner, R. Competences for Education for Sustainable Development in Teacher Education. *CEPS J.* **2013**, *3*, 9–24.
27. Corres, A.; Rieckmann, M.; Espasa, A.; Ruiz-Mallén, I. Educator Competences in Sustainability Education: A Systematic Review of Frameworks. *Sustainability* **2020**, *12*, 9858. [CrossRef]
28. A Rounder Sense of Purpose. *A Rounder Sense of Purpose: Educator Competences in Learning for Sustainability*. 2019. Available online: https://aroundsenseofpurpose.eu/wp-content/themes/rmwrk/documents/RSP_Competences.pdf (accessed on 30 October 2020).
29. Cebrián, G.; Junyent, M. Competencies in Education for Sustainable Development: Exploring the Student Teachers' Views. *Sustainability* **2015**, *7*, 2768–2786. [CrossRef]
30. Filho, L.W. (Ed.) *Nachhaltigkeit in der Lehre. Eine Herausforderung für Hochschulen*; Springer Spektrum: Hamburg, Germany, 2018; ISBN 978-3-662-56385-4.
31. Bentz, V.M.; Shapiro, J. *Mindful Inquiry in Social Research*; Sage: London, UK, 1998; ISBN 9780761904090.
32. Zuber-Skerrit, O. (Ed.) *Action Research for Sustainable Development in a Turbulent World*; Emerald Group Publishing: Bingley, UK, 2012; ISBN 978-1780525488.
33. Coghlan, D.; Brannick, T. *Doing Action Research in Your Own Organisation*; Sage: London, UK, 2014; ISBN 978-1412902472.

34. Krueger, R.A. *Focus Groups: A Practical Guide for Applied Research*; Sage: London, UK, 2014; ISBN 978-1483365244.
35. Morgan, D.L. *Focus Group as Qualitative Research*; Sage: London, UK, 1996; ISBN 978-0761903437.
36. Stewart, D.W.; Shamdasani, P.N. *Focus Groups: Theory and Practices*; Sage: London, UK, 2014; ISBN 978-1452270982.
37. Krueger, R.A. Designing and Conducting Focus Group Interviews. 2002. Available online: <https://www.eiu.edu/ihec/Krueger-FocusGroupInterviews.pdf> (accessed on 30 October 2020).
38. Escalada, M.; Heong, K.L. Focus Group Discussion. 2009. Available online: https://www.researchgate.net/publication/242589494_Focus_Group_Discussion_1 (accessed on 30 October 2020).
39. Kuckartz, U. *Qualitative Text Analysis: A guide to Methods, Practice & Using Software*; Sage: Los Angeles, CA, USA; London, UK; New Delhi, India; Singapore; Washington, DC, USA, 2014.
40. Leal Filho, W.; Levesque, V.R.; Salvia, A.L.; Paço, A.; Fritzen, B.; Frankenberger, F.; Damke, L.I.; Brandli, L.L.; Ávila, L.V.; Mifsud, M.; et al. University teaching staff and sustainable development: An assessment of competences. *Sustain. Sci.* **2020**, 1–16. [\[CrossRef\]](#)
41. Barth, M.; Rieckmann, M. Academic staff development as a catalyst for curriculum change towards education for sustainable development: An output perspective. *J. Clean. Prod.* **2012**, *26*, 28–36. [\[CrossRef\]](#)
42. Weinert, F.E. Concept of competence: A conceptual clarification. In *Defining and Selecting Key Competencies*; Rychen, D.S., Salganik, L.H., Eds.; Hogrefe & Huber: Seattle, WA, USA, 2001; pp. 45–65, ISBN 978-0889372481.
43. Zlatkin-Troitschanskaia, O.; Kuhn, C.; Toepfer, M. Modelling and assessing higher education learning outcomes in Germany. In *Higher Education Learning Outcomes Assessment—International Perspectives*; Coates, H., Ed.; Peter Lang: Frankfurt am Main, Germany, 2014; pp. 213–235.
44. Zlatkin-Troitschanskaia, O.; Shavelson, R.J.; Kuhn, C. The International state of research on measurement of competency in higher education. *Stud. High. Educ.* **2015**, *40*, 393–411. [\[CrossRef\]](#)
45. Garcia, M.R.; Junyent, M.; Fonolleda, M. How to assess professional competencies in Education for Sustainability?: An approach from a perspective of complexity. *Int. J. Sustain. High. Educ.* **2017**, *18*, 772–797. [\[CrossRef\]](#)

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