Educating the educators to be a driving force in higher education towards sustainable development

Christel Persson
Department of Environmental Science, Kristianstad University, Kristianstad, Sweden

Daniel Einarson
Department of Computer Science, Kristianstad University, Kristianstad, Sweden, and

Maria Melén
Library and Higher Education Development, Kristianstad University, Kristianstad, Sweden

Received 21 October 2022
Revised 16 December 2022
25 March 2023
Accepted 29 March 2023

Abstract

Purpose – This study aims to address how a higher education pedagogical course in sustainable development (SD) for university educators affects their teaching efforts in providing sustainability matters for students.

Design/methodology/approach – With the aim of improving that course, a case study approach was used to understand how the educators made use of the course in their teaching practice. Data were collected as written and oral feedback reflections and as semi-structured interviews at course completion.

Findings – Educators clearly express that they understand the concept "about" SD, but there are only vague expressions of a developed teaching repertoire to address education "for" SD in their teaching practice.

Research limitations/implications – When it comes to the purposes of developing sustainability literacy among students, implications from the study furthermore address the needs for further clarifications on both structure and intent on the course presented in this contribution.

Practical implications – The educators as well as their students will be exposed to, and trained in concepts, to prepare them to act in alignment with SD. This, in turn, meets requirements from higher education authorities concerning SD at higher education institutions.

Social implications – A core aim of the covered approach is to support student readiness in SD, and for those to become future agents of positive change.

Originality/value – This study has a focus on presenting how educators change the structures of courses and learning elements to approach SD in their teachings.

Keywords Sustainable development, Sustainable development goals, Higher education, Pedagogical courses, Educate the educators, Sustainability literacy

Paper type Case study

International Journal of Sustainability in Higher Education
Vol. 24 No. 9, 2023
pp. 197-212
Emerald Publishing Limited
1467-6370
DOI 10.1108/IJSHE-10-2022-0332

1. Introduction

Directives from the governance of Swedish higher education (HE) (The Swedish Higher Education Act, 2020) have stated that sustainable development (SD) must be considered at Swedish universities at large, and especially within education at HE institutions, where concepts concerning SD (United Nations - Department of economic and social affairs, 2022), should be included in various courses. Students shall be exposed to, and trained in such concepts, to prepare them to act in alignment with SD.

That fact has resulted in a thematic evaluation concerning how the Swedish universities have lived up to such demands. The national survey, which was conducted by the Swedish Higher Education Authority (The Swedish Higher Education Authority, 2020; Finnveden *et al.*, 2020), showed that the Swedish universities generally treated the work with SD in an insufficient way and called for a better alignment within HE organizations towards the issues that SD represents. This result then implied requirements on improvements at several levels of the universities, such as at organizational levels, at levels of teacher development and in student learning practices.

Consequently, the home university of the authors of this contribution (Kristianstad University, HKR) has put efforts into improving its processes, so that SD is addressed in educational programs. A preliminary study was conducted to share experiences between representatives of several disciplines regarding how SD was approached (Argento *et al.*, 2020). Moreover, an even further step was taken by the authors of this contribution, where a course for the university's educators, *Teaching for SD* was initiated and given. The main reason behind that initiative has been to support the educators in their relation to SD and the implementation of SD into their teaching practice. As a consequence, the initiative indirectly addresses and promotes the students' SD readiness as future professionals and citizens. Moreover, this paper points out a significant role that universities have as a contributor to a sustainable society. Thus, this study aims at approaching the student's sustainability literacy (SL) through the process of maturing the educators' teaching and learning practice in the context of SD.

The course is developed and given by members of the HE development department that offer staff development courses, and the Faculty of Science where SD expertise resides. The course has been offered and given voluntarily for the university educators for their competence improvement regarding SD. Its structure and content are reported in several publications (Persson *et al.*, 2020; Melén *et al.*, 2020). The purpose of this paper is to further shed light on the results of the course, by further emphasizing the educators' efforts. The context of this contribution is illustrated in Figure 1, where the following processes and artefact outcomes are outlined:

- A thematic evaluation, conducted by authorities (The Swedish Higher Education Authority, 2020) pointing out general needs for Swedish universities' educational

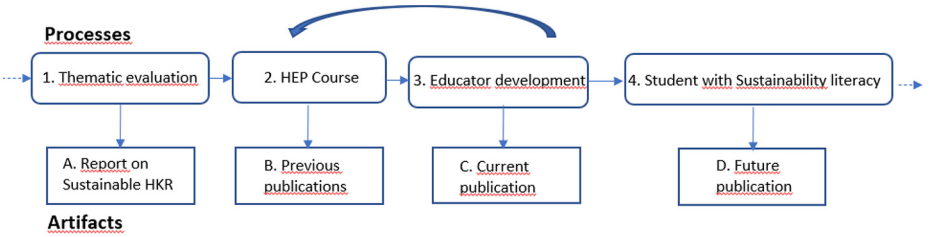


Figure 1.
The study's contribution context, where the focus here lies on Step 3

Source: Author's own creation/work

improvements concerning SD. An investigation into the circumstances of HKR, and suggestions for how to improve, was reported internally within the university (Artifact A, *Internal report: dnr: 2017-1121-389*). In that report a Pedagogical Course for educators was mentioned amongst the suggestions.

- The HE Pedagogical Course, covered in this contribution, where structure and content have been published [Artifact B. (Persson *et al.*, 2020; Melén *et al.*, 2020)].
- The efforts of the participating educators of the course, with this contribution as a reported outcome (Artifact C.).
- The perception on the student side as an effect of the educators' teaching efforts. A study on this is an important future approach to further understand the outcome of the course.

The input to the steps of Figure 1 (the left dashed arrow) represents demands on the universities to provide qualitative education for students or those to become responsible and contributing to future citizens. The right dashed arrow does then represent those students, and their received abilities. The fourth step of Figure 1 is significantly important. However, the outcome, D., is here to be approached through a future follow-up study. Furthermore, the concept of SD is certainly constantly evolving. Thus, this will imply further course development, represented by the overarching arrow referring to Box 2 in Figure 1.

In this contribution, the focus is on artifact C., by investigating the following research questions:

RQ1. What has happened to the educators' concept about SD since they took the course?

RQ2. What new repertoire has been acquired and developed in the educators' teaching practice for SD?

The educators that participated in the course had responsibilities at course levels, as well as at program leading levels. While the course is given across faculties at the university, we focus here mainly on teachers from the faculties of Natural Sciences and Health Sciences, and here especially in educational programs for environmental scientists and nurses.

The prime focus of this contribution is on investigating how SD is implemented in teaching and learning contexts. This includes the learning objectives in syllabi, course learning activities and course examinations. Still, further investigations relate to organizational levels, concerning collegial development within work teams, program groups and research environments.

The article is structured as follows: a literature review puts this contribution in a HE SD context. Thereafter, the methodology of use is presented, and the result of the study is provided.

2. Background: the challenge of advancing the agenda of sustainable development in higher education

This section aims to provide understanding about the challenging but nevertheless importance of promoting HE educators to improve their teaching practice concerning sustainability issues. The research aims at binding together the mission of HE to be a driving force about and for SD and connect it with the output of building students with SL.

HE has a critical role in advancing the agenda of SD. Educating for SD can be considered a natural way to ensure SD. However, to lead the needed transformation in society and bring lasting value and equitable impact to the benefit of its stakeholders, HE needs to implement the concept of SD into their own organizational culture. In general, when shaping a sustainable

organization, success very much lies in the ability to walk the talk, i.e. to be aligned with the mission of SD. This applies throughout the organization from its mission and strategies to its management ideas, staff capacity and stakeholders (Li *et al.*, 2019).

Ever since the Stockholm conference in 1972 (Ivanova and McDonald, 2021) HE has been recognized for its important role in fostering society towards SD. Many HE institutions have been committed to implementing SD into their academic systems in the shape of strategies, policies and staff development. However, still, as expressed in the introduction of this paper, HE has been criticized for not living up to this mission (The Swedish Higher Education Act, 2020) and there might be several reasons for this. One important reason is that although universities are giving increasing priority to the challenges of SD, they might overlook the obvious obligation of fully embedding sustainability into their own system. The re-designing of curricula is a relatively easy part, but efforts that imply organizational members to hold shared assumptions about SD and take the lead in society demand something else.

2.1 Considering a course frame that advance teaching practices

Courses for educators in HE does not exist in a vacuum. Rather, they can only thrive in a culture of participation in the transition towards sustainable universities (Disterheft *et al.*, 2015). Since the educators in HE might function as gatekeepers for the student's development of SL, support in developing good teaching practices that can improve the student learning environment is important. Rögele *et al.* (2022) points out educators' challenge in combining knowledge transmission with competence building in their teaching. This challenge, as well as the organizational context, must be addressed when educating the educators. Therefore, Figure 2 shows an ideal line of thoughts and considerations when building a pedagogical course that advances 'educators' concepts and teaching practices. The challenge is to build a course for educators (Box 2) and at the same time consider the overall context (Box 1) and the long-term goal (Box 3).

Create awareness of the context within educators. Box 1 in Figure 2 stresses that the overall context and thus, mission includes to implement SD in HE and as SD is a principle or concept that contains both goals and a call for action competence that leads towards these goals, it challenges the traditional goal-oriented mission of HE in Sweden. Since the beginning

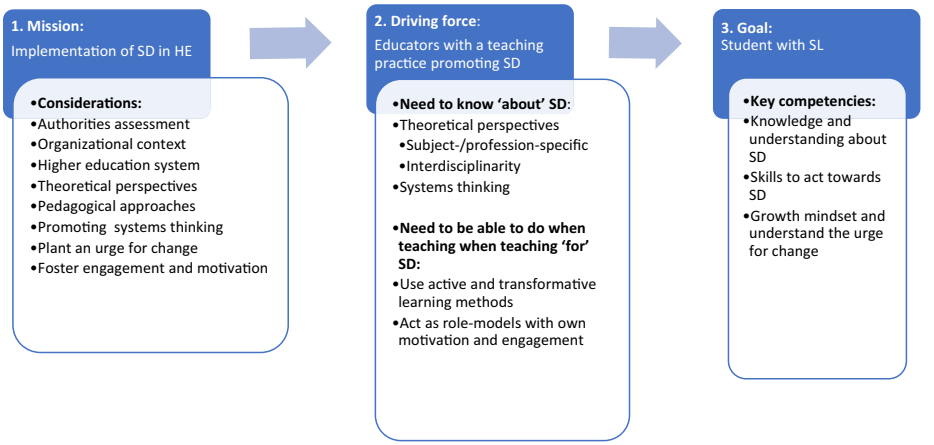


Figure 2.
Ideal outline with three aspects to consider from overall course context towards SL

Source: Author's own creation/work

of the 2000s, Swedish HE has expanded in that more students are undergoing a university degree. This is seen as a result of HE adapting its mission towards providing society with a qualified labour force. In Sweden, this has been criticized for resulting in mass education with less focus on formation and building the individual (Strannegård, 2021). Perhaps this is part of the challenge with the implementation of SD in HE? In the aim for SD, the globe is now the client and the order to HE is to provide its systems with both adaptations, in the form of labour, and transformation of the system. This implies a challenge in the undertaking of educating the educators in that they have an updated mission.

2.2 Advancing "about" as well as "for" sustainable development

There are two essential concepts to have in mind when approaching the above suggested transition of the sustainability mission in HE. To emphasize a more transformative mission of HE, it has become commonplace to distinguish education "about" SD from education "for" SD (Thomas, 2009). Although the two concepts coexist, they underline the required changeover in perspective and mission of sustainability education. Just as society has responded gradually to the nature of sustainability and SD, so must also HE. Thomas (2009) describes the needed transition in HE from one of a cosmetic kind "about" SD towards one with more integrated approaches. The development of education "for" SD that guarantees student readiness implies an extensive and fundamental transformation in HE. This overall scenario must be taken into consideration when educating the educators. Box 2 in Figure 2 exemplifies considerations to be made in the choice of focus and level of ambition. The concept SL gives an idea of the final goal and thus gives academic developers directions of where to aim in building course content. All in all, educating the educators "for" SD must be action oriented with transformative purposes. When educating the educators "about" and "for" SD, focus needs to be on developing competence-oriented teaching (Dlouhá *et al.*, 2019). Thus, aiming for educators to develop concepts and teaching repertoires implies providing them with teaching approaches and methods that involve and engage the student as well as introducing them to new perspectives that develop competencies for SD. For the educators, this implies a shift from instructional teaching approaches and passive learning environments to a capacity-building and active learning one (Lozano *et al.*, 2019).

2.3 Repertoires "for" sustainable development involves action-oriented teaching approaches

In taking on the responsibility of educating "for" SD, the teachers thus might run into barriers, as they must reorientate both the curriculum as well as the teaching and learning environment. Teachers are most likely skilled to develop curricula from within their familiar disciplines where a frame of ideas already exists. However, working with SD requires them to seek broader knowledge outside their traditional subject of teaching. This is what new repertoire implies. In recent years there has been a shift from teacher-centred approaches towards more student-centered teaching approaches. These barriers can and should be addressed in courses for educators (Persson *et al.*, 2020). Although an increased acceptance for and implementation of SD associated education, recent studies (Caniglia *et al.*, 2020; Freeth and Caniglia, 2020) suggest a more action-oriented approach within the science and education of SD to support teaching and learning interventions that create transformative change. There exist examples of ways to approach this by inviting guest lecturers from a variety of disciplines to give perspectives on how to address SD in teaching practice. This way system thinking is promoted in that educators get inspiration to see and address SD in relation to other SD aspects, disciplines and teaching methods (Lozano *et al.*, 2015; Persson *et al.*, 2020). These kind of meetings across disciplines can also encourage educators to create

transdisciplinary settings where they enrich the learning environment with experts from the outside community (Caniglia *et al.*, 2018).

2.4 Promoting highly committed educators with innovative skills

There are good examples of sustainability curricula that imply collaboration and interdisciplinarity between students (Alm *et al.*, 2021; Argento *et al.*, 2020). However, a commitment above the ordinary can be required from both educators and students when designing for the teaching and learning environments that promotes genuine and long-term capacity within the student to develop key competencies for SD (Caniglia *et al.*, 2018). The implementation of SD into educators' teaching and learning practice also requires them to innovate teaching, first when it comes to reorienting the curricula but foremost when it comes to applying new teaching approaches. Experts point out the importance of stimulating educators to develop and work with tangible teaching methods such as challenge-based learning. This requires courses for educators that not only assess knowledge "about" but also that the educator can exemplify a teaching repertoire that stimulates the student capacity to act "for" SD (Biasutti *et al.*, 2018: Guest *et al.*, 2012; Lozano *et al.*, 2017).

2.5 Course goal: be able to educate sustainable literate students

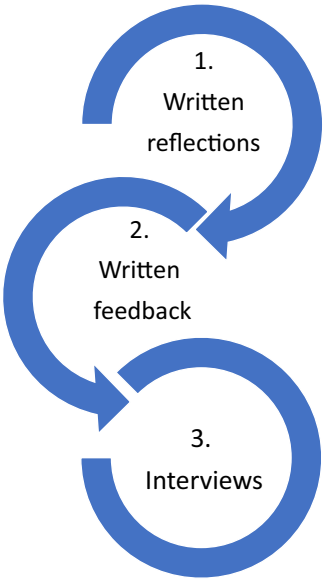
As Box 3 in Figure 2 illustrates, having SL developed knowledge, skills and a growth mindset that allows for commitment towards building a sustainable future and assisting in making informed and effective decisions to this end (Leal Filho *et al.*, 2021). Skills, to be able to do or act, and mindset, which is about developing an approach and judgement, were illustrated, and formally introduced as overall learning goals in the Swedish HE system through the Bologna process. Although not self-evident, the acquisition of knowledge and skills has been quite smoothly implemented in educators' teaching agenda. However, learning goals connected with approach and judgement can be a challenge to reach as it aims towards 'students' personal development or as expressed in the context of SL, a shift towards a growth mindset (2021). The educators need to advance both their teaching agendas and pedagogical repertoire. Educational programs "about" and "for" SD still agree on the importance of fostering these competencies in HE although they are constantly developing in terms of how they are hierarchal related and their learning objectives (Brundiers *et al.*, 2021).

2.6 Considerations for course development

In summary, HE has the important but challenging role of being a driving force towards SD. The role of the educator is crucial in that it is the educator that facilitates the student towards learning goals in an appropriate learning environment. Given the complexity of SD, courses for educators are necessary but a challenging project. When educating the educator, one should keep in mind to promote educators' ability to set the teaching and learning scene in order to foster transformation and change "for" SD. In the following, the educators' experiences, and reflections after such a course is followed up. Did they advance their concept "about" SD and can new repertoires "for" SD in their teaching agenda be recognized?

3. Methods and empirical context

With the aim of improving the pedagogical course, a case study approach (Merriam, 1988) was used to understand how the educators made use of the course in their teaching practice. The data collection contains three steps (Figure 3) where 15 educators contributed with their written reflection in a course assignment (Step 1) and written feedback in a course evaluation (Step 2). Four of the educators were also interviewed in semi-structured



Notes: 1. Written reflections in the course assignment; 2. Written feedback in course evaluation, and 3. Interviews with four of the educators, 18–20 months after the course ended
Source: Author's own creation/ work

Figure 3.
The illustration shows the three steps of the data collection

interviews (Step 3) 18–20 months after the course, the reason why the interviews were carried out after some time after the course ended was to follow up how the educators made use of the course in their teaching practice. The 15 educators teach in various areas, such as educational science, health science, environmental and biological science and computer science.

In the course, the educators met several guest lecturers from different subject disciplines. The guest 'lecturers' areas of expertise were ecology, economics, health science and gastronomy. The course focussed on the development of syllabi, implementation of learning activities and examinations. The purpose of the course assignment, in Step 1 was to, in connection with insights into SD means, prepare their students towards SL, for the ability to analyse, argue and problematize SD issues. The educators worked in pairs on the examination assignment, which was divided into two parts: a practical part that was presented orally at the time of the examination; and an individual and concluding written part that was assessed. For the oral exam, the students would plan to complete a 15-min learning activity with the other course participants. The session ended with an oral reflection and discussion on the theme of SD in the group. The individually written

examination part required that the educators related the planned learning activity to course objectives and examination requirements in both the planning phase and the implementation phase as well as in the evaluation phase. The reflections and discussions (Step 1) were about critically reflecting on the concept of sustainability in relation to different conflicts of interest in the role as a professional teacher.

The idea with the course evaluation (Step 2) and the reflections in the course assignment (Step 1) was to get more knowledge from the 15 educators about their insights at the end of the course. The starting point for several of the educators, as it turned out in the introductory course elements, was that the concept of SD was vague in relation to their teaching practice.

One of the educators of the semi-structured interviews (Step 3) belongs to the Faculty of Health Sciences, and the other three belong to the Faculty of Science, where they also have a focus on environmental issues. In addition, two of the four have overall responsibility for education in parallel with course responsibility, whereas the other two only have course responsibility. To find answers to the two research questions, the educators had to develop their views on which aspects of sustainability and teaching for SD that they considered had been acquired after the course. Therefore, the educators had the interview questions sent to them in advance to have the opportunity to prepare for the interview. The four interviews were conducted online and lasted 30 min for each course participant. The implementations that took place in the immediate local environment (e.g. in teaching and research environments at the university) were investigated. *How have the interviewed educators enriched their working environment and how is this expressed 18–20 months after the course in terms of being a driving force among their colleagues? What changes have taken place in their teaching agenda?* Considerations when developing a course like this can be seen in the ideal context of recent research aspects (as described in the theory part, Figure 2) and on our own (the authors of this article) experience of teaching and learning in this context.

3.1 Data analysis

The three-step design of this case study aimed at capturing what had happened with the 'educators' concept "about" SD, as they took the course, as well as how this could be exemplified in their teaching practice with consciously developed teaching activities. These two overall study questions are aligned with Thomas's (2009) idea about distinguishing between HE "about" and "for" SD. HE "about" SD indicates how familiar educators are with SD as a field of knowledge. HE "for" SD, on the other hand, says something about their capacity to translate this field of knowledge into their teaching practice (Figure 2, Box 2) leading to activities that boost SL within the student. The data was analysed by categorizing each step in the study design (Step 1, Step 2 and Step 3) according to "about" and "for" SD. The substantial content when teaching on environmental and sustainable issues may risk being marginalized and replaced by fragments from different subjects. When analysing the details and the total at the same time, there may be interactions between all disciplines. This enables the educators to develop a teaching practice "for" SD. Key findings represent both the concept "about" and "for" SD. For example, when the educators expressed that the course had given them new insights and perspectives, it was categorized as an expression of knowledge "about" SD. New approaches to teaching and learning activities were on the other hand interpreted as expressions of knowledge "for" SD. In the results, we distinguish between clear and vague expressions of advanced concepts and repertoires of teaching practices.

3.2 Strengths and limitations of the study

Central to qualitative research on social or human phenomena is to interpret data and see it from the 'respondents' perspective. Semi-structured interviews take place as a verbal communication where one person, the interviewer, has the purpose of obtaining information from another person by asking questions. Researchers sometimes rely on semi-structured interviews as a stand-alone method; sometimes they are used in conjunction with other methods (Guest *et al.*, 2012). Although the design of this case study implies different datasets, the two categories "about" and "for" retrieved from the literature review (Thomas, 2009) give understanding and structure to the interpretation of each step and these categories bind the steps together. This strengthens the three-step design idea. The strength of this case study is, however, to study only the teachers' knowledge development in a first stage. The intention is to understand what more educational efforts (knowledge content and teaching methods) that the teachers express are necessary before the meeting with the students in learning for SD.

4. Results

In relation to the twofold study aim the key findings are summed up in Table 1. The ambition was also to shed light on what had *not* happened in the educators teaching practice "for" SD. The result from the three-step data collection indicates that the 15 educators clearly express that they understand the concept "about" SD in various ways (indicated by a big X). However, there are only vague expressions of a developed teaching repertoire to address

Research question (RQ)	Key findings	Teaching practice "about" SD	Teaching practice "for" SD
1. What has happened with the educators' concept "about" SD since they took the course? *(Data collection mainly from method step 1 and 2*, Figure 3)	a. A deeper understanding of the concept "about" SD and how different SD goals can be understood from their main discipline	X	
	b. Development of understanding "about" SD as a multidisciplinary concept	X	
	c. Experience that empowers them to discuss HE "about" and "for" SD with colleagues, students, and stakeholders	X	x
2. What new repertoire have been acquired and developed in the educators' teaching practice "for" SD? *(Data collection mainly from method Step 3*, Figure 3)	a. Collection of good examples and inspiration of how they can work "for" SD in their teaching practice	X	x
	b. Teaching-tools that promote active learning for the development of SL	X	x
	c. Collegial exchange of disciplinary ideas and challenges that might bring forward the urge for interdisciplinary perspectives and collaboration	X	x

Source: Author's own creation/work

Table 1. Research questions, key findings from the data and analysis of development (indicated by a big X or a small *x*) in the educators teaching practice in relation to teaching "about" and "for" SD

education "for" SD in their teaching practice (indicated by a small *x*). This "lack of results" will give the opportunity to discuss course development in relation to the aim of increased student SL. The results are presented in accordance with 1-a, b, c and 2-a, b, c in Table 1.

4.1 The concept "about" sustainable development

The global SD goals (1a). The educators emphasize that the global goals have had a much greater impact on society than they have experienced concerning the previous millennium goals. They experience the global goals as easily accessible and that they shed light on how the different perspectives can be integrated based on what SD entails. Some of the educators also emphasize the importance of conserving and recreating ecosystems and soil and of protecting biological diversity. They show that they have become aware of the dilemma of both using natural capital to meet the needs of a now growing population and at the same time preserve it for the future. They also raise the question of how interest in global goals can continue to be relevant and actualized in the future.

Development of the concept "about" SD (1b and 1c). The course has been very much based on interactions between the course participants, aiming at sharing good examples and inspiration. The educators discuss how they have broadened the concept of SD based on their subject areas, e.g. health and sustainability, education and SD linked to economic aspects. With the same aim, several guest lectures from different parts of the university provided valuable experiences related to SD. Regarding food and sustainability, an educator in teacher education writes that during the course she received an interesting description of how the theme of health and sustainability can permeate the collegial conversation. What we choose to eat and how we buy and consume food are important issues for sustainability and clearly linked to the economy, societal issues, and the use of nature's resources. One educator asked herself how to deal with this issue in pre-school teacher education:

> The lecture has made me think about how to encourage a population to believe that insects as food is a good idea. Start with the kids? How can a preschool teacher be an actor in this?

Written reflections further show that SD is an extremely broad and complex area, and it is complicated to adapt the teaching practice to a reasonable level with relevant focus. They believe that it can be a challenge to achieve a collegial consensus regarding how to approach SD in their respective disciplinary contexts. They believed that it is the program group leader who should generally guide and encourage teachers to work actively to integrate SD in their teaching practice. Introductory lectures on SD should be organized outside the program areas as all education should integrate it into the programs. Another comment reflects this through:

> This university pedagogy course has really reminded me of the benefits of meeting and discussing subject areas from different subject perspectives.

Furthermore, they write that the different perspectives that have been clarified in the course have contributed to them now seeing the concept of SD from a broader perspective. Educators from the nursing program believe that they have been given pedagogical tools to be able to identify more circumstances that affect SD and that are related to health and medical care. As several subject areas work on common issues and can be integrated with each other, this should mean that further multidisciplinary research is needed.

4.2 The concept "for" sustainable development

The global goals related to development "for" SD (2 a, b and c). The respondents gradually clarified that via the global sustainability goals they gain insight into each other's subject

areas, which creates a potential for cooperation. The educators also express that the global SD goals can be addressed in different educational contexts aimed at entrepreneurs and other actors. The interpretation of the SD sub-goals is that there is great confidence and trust to relate to technical development and innovations in their teaching practices.

Experiences from the educators is that they have gained knowledge, tools and opportunities to organize new courses for the next generation of students. As one of the educators expresses in the written reflection (Step 1) related to SDG 3 "Good health and well-being":

> Teaching nursing students through e.g., simulation exercises can provide student centred learning for SD, a learning for the future profession of a nurse. In addition, teachers from other faculties can be invited and interprofessional teaching teams formed to contribute to SD together.

Developing teaching practice "for" SD through good examples (2a, b and c). The course seems to lay a foundation for the educators' teaching practices according to SD. Statements that motivate this include: "The course assignments can be directly applied to current research of a specific discipline", and "That the course's information can be directly applied to current course development is seen as part of the course's strengths, as well as the tips on specific working methods". Providing such a foundation in combination with the educators' mutual communication on SD, seems to further have contributed to inspiration and insight, as pointed out by:

> The combination of lectures on SD and examples of how it can be translated into courses and teaching. That we got to share with each other how we intend to implement the concept of SD in courses. I received both subject specialization and practical tools,

And:

> The combination of lectures on SD and examples of how it can be translated into courses and teaching. That we got to share with each other how we intend to implement the concept of SD in courses. I received both subject specialization and practical tools.

It is not only the core structure of the course that contributes to knowledge "about" SD, but also its values of being a meeting point for shared experiences.

Collegial consensus regarding the need for active learning tools (2b). The educators reflect positively on one of the guest lecturers' own pedagogical examples of education "for" SD. An educational concept that they themselves will try is to end certain lessons in their teaching with a so-called "two-minute paper". The questions are asked in a way that places expectations on valuing what they have been through and not just writing something they happen to come across. They express that they will use it in their own teaching with their students at the university. Examples of questions for the "two-minute paper" are as follows: *What was the most important thing you learned today? What was the confusing point in today's lecture and perhaps the most difficult to understand?*

4.3 Further indication of "about" and "for" sustainable development

The interviews (Step 3 of Figure 3) focussed on three main aspects:

(1) How has their view "about" SD changed?

(2) What happened in the teaching practice, "for" SD, as an effect of the higher pedagogical course, and what new repertoire of HE pedagogical and didactic methods that could be seen conquered because of the course?

(3) What future challenges can be seen? Generally, the educators expressed that they, after the course, could relate both to the aspects "about" SD, and learning "for" SD through their courses.

Generally, from the perspective of Table 1, the results from the interviews can be shown to clearly contribute to the research questions and the key findings. We here relate to the aspects of Table 1 (*1 a-c*, and *2 a-c*), to clarify the correspondences between those and the results of the interviews.

In general, the educators express satisfaction with the course, with in-depth insight as a result. Furthermore, the pedagogical course generally seems to have contributed to an ongoing process towards clarifying SD in course plans. Especially when new syllabi are under development, themes regarding "about" SD are included. (1 a, 2 a).

It is pointed out that the ability to argue, ask critical questions and pay attention to the environmental and sustainability perspectives of various citizens is something that is needed to constantly emphasize. Furthermore, role-plays and oral opposition should in the future be included in the teaching repertoire in learning "for" SD (2 b, c).

The course, moreover, has helped in shedding light on essential SD-aspects, such as democratic and ethical approaches, gender equality, equal treatment, health issues and economic perspectives on SD. One of the educators mentions that the course provided inspiration and tools to be able to concretize the connections between humans, animals and nature and climate and environment into teaching and learning activities (1 b).

It is also mentioned that once the course objectives are set, the learning activities follow. Course activities such as seminars and exams are thus linked to SD. It is here pointed out that the ability to argue, ask critical questions and pay attention to the environmental and sustainability perspectives of various citizens is something that is needed to constantly emphasize. Furthermore, role-plays and oral opposition should in the future be included in the teaching repertoire in learning "for" SD (2 b).

The educators expressed a wish that their colleagues also should take the course, and the importance of the role of SD from a quality assurance perspective. It is mentioned that it is important to continue working with this. However, not much is seen of evaluations from students and their feedback. It is the implementation towards students that is the biggest challenge. It is therefore beneficial if program directors are involved in this. (1 c, 2 c).

According the third point of the interviews, on future challenges, the educators were told to reflect on this to address future actions regarding teaching/learning for SD in HE, and furthermore, what role they should have in this. The educators discussed this aspect rather vaguely. It was pointed out that the biggest challenge is probably how to express effective alignment between the content of the course and its exams, to respond well to the course's basic themes. Furthermore, the possibilities and potentials of a *Teaching for SD*-follow-up course was discussed, which in that case would further address different ways of implementing SD in education.

5. Discussion: higher education for sustainable development, a work in progress

The purpose of this contribution has been to investigate the feasible development and transformation of educators' awareness of teaching practice, in relation to the concept of SD, after they participated in the pedagogical course *Teaching for SD*. It can also be regarded as significant to see how this may have affected them in their roles as educators and educational leaders. Although it is only a two-week course, judging by the educators' feedback, clearly positive effects of the course are reported. Exchange of experience between

educators from different fields of education has been seen as rewarding and inspiring for their own continuing work, as well as the structure and tasks of the course as such.

The study behind this paper shows that the course has contributed well to new insights "about" and "for" SD, as well as clear conscious efforts on the educators' part, to make their students aware of different aspects of SD. This is in line with strivings towards making the student literate for SD (Brundiers *et al.*, 2021; Caniglia *et al.*, 2018; Leal Filho *et al.*, 2021).

As far as the educators¨ own development of the concept of SD is concerned, this is expressed in very few words. In order to inspire and develop an understanding "about" SD, a possible starting point seems to be to start with the SDG:s. A result from the written reflections relates to unevenly/unfair distributed resources such as food on earth, which led to collegial discussions about hunger/famine/starvation (SDG 2) and sustainable consumption and production (SDG 12) from both an ecological, economic and psychological perspective. These aspects were integrated in the pedagogical course and made the educators curious about nudging, which is about guiding peoples' behaviour in the desired direction, not just in economic and financial matters. The educators discussed challenges of being able to introduce and encourage future pre-school teachers to possibly eat insects with pre-school children in the future. The many discussions and exchanges of experiences have, by the educators, been pointed out as one of the core strengths of the course.

The observations show that the awareness "about" SD among educators has generally expanded. More specifically, this applies to core knowledge of SD as such, and how the concepts relate to one's own discipline as well as to other disciplines. Still, what also is addressed is that it also relates to how the concepts are applied in the course activities.

Statements from the educators indicate the value of the collegial exchange of pedagogical ideas and how interdisciplinary collaboration develops awareness of SD and the concept of SD. The course fulfils another important role in bringing together experts in different disciplines for mutual exchange of knowledge and good examples in teaching and teaching tools, here especially to strengthen general knowledge "for" SD.

Consideration for course development. This paper resides in a context where we bind together the mission of HE to be a driving force. Moreover, this mission must be implemented into educators teaching and learning practice improving the SL at the student part. Working with SD in HE demands a strong focus on and awareness of SL, as the outcome for the student. Thus, HE must elaborate more on how to head for this within the teaching and learning agenda but also make the student aware of the concept (Leiva-Brondo *et al.*, 2022). SL behaviour should be about combining knowledge, skills and mindset. Thus, developing courses for educators must include integrating teaching methods that result in learning that alters behaviour and mindset. This implies supporting the educators in developing clearer learning goals regarding the how (verbs in the syllabus) and what (the content) but also considerations when it comes to awareness of measures to follow up learning goals concerning skills and mindset related to the "for" of SD.

This contribution shall be seen in the context of demands from Swedish Higher Education Authorities on SD in the education of the Swedish universities. Criticism regarding a generally incomplete handling of SD within the Swedish universities has led to initiatives having to be taken to support such educational elements. It has been shown that the course initiatives that are described in this paper provide clear support for the educators to carry out such elements, and thus meet the previously mentioned criticism.

5.1 Future study: How does the student notice when the educator develop teaching "about" and "for" sustainable development?

One thing that is mentioned that deserves further reflection is that there is not yet much control over if and how the students' SL is improved. On the one hand, more time is probably needed to allow changes to take place. On the other hand, surveys are needed

directly towards the students themselves (as pointed out by Process 4, in Figure 1). SL within the student can, as with the educators, be studied with help from how they express knowledge both "about" and "for" SD.

Such study needs to be prepared to allow the responding students to reflect on both the structure of SD within the courses they take, and their possible future capacity to act towards SD. How well do they see that the courses support their knowledge of SD and how this knowledge can be applied outside the university? In what way do they see that they can and will contribute to SD as an effect of skills developed within the university?

Another thing that has been discussed is opportunities for a follow-up course. Such a course would go even deeper into the implementation of sustainability themes. At the authors' home university, there is no such course at present, and it is uncertain at present whether such a course exists elsewhere. Given that organizational consensus and cultural change are important for the implementation of SD, the two-week format of the present course may not serve that purpose. Alternative frameworks that imply approaching the SD issue more long-term and continuously where different levels in the organization are integrated rather than framed in a two-week course (Li *et al.*, 2019).

References

Alm, K., Melén, M. and Aggestam-Pontoppidan, C. (2021), "Advancing SDG competencies in higher education: exploring an interdisciplinary pedagogical approach", *International Journal of Sustainability in Higher Education*, Vol. 22 No. 6, pp. 1450-1466, doi: 10.1108/IJSHE-10-2020-0417.

Argento, D., Einarson, D., Mårtensson, L., Persson, C., Wendin, K. and Westergren, A. (2020), "Integrating sustainability in higher education: a Swedish case", *International Journal of Sustainability in Higher Education*, Vol. 21 No. 6, pp. 1131-1150, doi: 10.1108/IJSHE-10-2019-0292.

Biasutti, M., Makrakis, V., Concina, E. and Frate, S. (2018), "Educating academic staff to reorient curricula in ESD", *International Journal of Sustainability in Higher Education*, Vol. 19 No. 1, pp. 179-196, doi: 10.1108/IJSHE-11-2016-0214.

Brundiers, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Doucette-Remington, S., Dripps, W., Habron, G., Harré, N., Jarchow, M., Losch, K., Michel, J., Mochizuki, Y., Rieckmann, M., Parnell, R., Walker, P. and Zint, M. (2021), "Key competencies in sustainability in higher education – toward an agreed-upon reference framework", *Sustainability Science*, Vol. 16 No. 1, pp. 13-29, doi: 10.1007/s11625-020-00838-2.

Caniglia, G., John, B., Bellina, L., Lang, D.J., Wiek, A., Cohmer, S. and Laubichler, M.D. (2018), "The glocal curriculum: a model for transnational collaboration in higher education for sustainable development", *Journal of Cleaner Production*, Vol. 171, pp. 368-376, doi: 10.1016/j.jclepro.2017.09.207.

Caniglia, G., Luederitz, C., von Wirth, T., Fazey, I., Martín-López, B., Hondrila, K., König, A., von Wehrden, H., Schäpke, N.A., Laubichelr, M.D. and Lang, D.J. (2020), "A pluralistic and integrated approach to action-oriented knowledge for sustainability", *Nature Sustainability*, Vol. 4 No. 2, pp. 93-100, doi: 10.1038/s41893-020-00616-z.

Disterheft, A., Caeiro, S., Azeiteiro, U.M. and Filho, W.L. (2015), "Sustainable universities – a study of critical success factors for participatory approaches", *Journal of Cleaner Production*, Vol. 106, pp. 11-21, doi: 10.1016/j.jclepro.2014.01.030.

Dlouhá, J., Heras, R., Mulà, I., Francisca, P.S. and Henderson, L. (2019), "Competences to address SDGs in higher education – a reflection on the equilibrium between systemic and personal approaches to achieve transformative action", *Sustainability*, Vol. 11 No. 13, p. 3664, doi: 10.3390/su11133664.

Finnveden, G., Friman, E., Mogren, A., Palmer, H., Sund, P., Carstedt, G., Lundberg, S., Robertsson, B., Rohde, H. and Svärd, L. (2020), "Evaluation of integration of sustainable development in higher education in Sweden", *International Journal of Sustainability in Higher Education*, Vol. 21 No. 4, pp. 685-698.

Freeth, R. and Caniglia, G. (2020), "Learning to collaborate while collaborating: advancing interdisciplinary sustainability research", *Sustainability Science*, Vol. 15 No. 1, pp. 247-261, doi: 10.1007/s11625-019-00701-z.

Guest, G., Namey, E. and Mitchell, M. (2012), *Collecting Qualitative Data: A Field Manual for Applied Research*, 1st ed., SAGE Publications, Thousand Oaks, CA.

Ivanova, M. and McDonald, J.W. (2021), *The Untold Story of the World's Leading Environmental Institution: UNEP at Fifty*, MIT Press, Cambridge, MA.

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., Will, M., Pace, P., Azeiteiro, U.M. and Lovren, V.O. (2021), "University teaching staff and sustainable development: an assessment of competences", *Sustainability Science*, Vol. 16 No. 1, pp. 101-116, doi: 10.1007/s11625-020-00868-w.

Leiva-Brondo, M., Lajara-Camilleri, N., Vidal-Meló, A., Atarés, A. and Lull, C. (2022), "Spanish university students' awareness and perception of sustainable development goals and sustainability literacy", *Sustainability*, Vol. 14 No. 8, p. 4552.

Li, H., Nazir, S., Wang, Q., Muhammad, A., Khaqan, Z. and Shafi, A. (2019), "Influence of transformational leadership on employees' innovative work behavior in sustainable organizations: test of mediation and moderation processes", *Sustainability*, Vol. 11 No. 6, p. 1594, doi: 10.3390/su11061594.

Lozano, R., Barreiro-Gen, M., Lozano, F.J. and Sammalisto, K. (2019), "Teaching sustainability in European higher education institutions: assessing the connections between competences and pedagogical approaches", *Sustainability*, Vol. 11 No. 6, p. 1602, doi: 10.3390/su11061602.

Lozano, R., Merrill, M.Y., Sammalisto, K., Ceulemans, K. and Lozano, F.J. (2017), "Connecting competences and pedagogical approaches for sustainable development in higher education: a literature review and framework proposal", *Sustainability*, Vol. 9 No. 10, p. 1889, doi: 10.3390/su9101889.

Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F.J., Waas, T., Lambrechts, W., Lukman, R. and Hugé, J. (2015), "A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey", *Journal of Cleaner Production*, Vol. 108, pp. 1-18, doi: 10.1016/j.jclepro.2014.09.048.

Melén, M., Persson, C. and Einarson, D. (2020), "Educate the educators in teaching and learning for sustainable development", *ETH Learning and Teaching Journal*, Vol. 2 No. 2, pp. 338-341.

Merriam, S.B. (1988), *Case Study Research in Education*, Josey-Bass, San Fransisco, CA.

Persson, C., Melén, M. and Einarson, D. (2020), "Undervisning för hållbar utveckling: att stödja högskolelärares arbete med agenda 2030", *Högre Utbildning*, Vol. 10 No. 1, pp. 18-24, doi: 10.23865/hu.v10.1949.

Rögele, S., Rilling, B., Apfel, D. and Fuchs, J. (2022), "Sustainable development competencies and student-centered teaching strategies in higher education institutions: the role of professors as gatekeepers", *International Journal of Sustainability in Higher Education*, Vol. 23 No. 6, pp. 1366-1385, doi: 10.1108/IJSHE-02-2021-0069.

Strannegård, L. (2021), *Kunskap Som Känns: en Lovsång till Att Lära Sig Något Nytt*, Mondial, Stockholm.

The Swedish Higher Education Act (2020), "The Swedish higher education act (1992:1434) – Swedish council for higher education (uhr.se)", available at: www.uhr.se/ (accessed on 13 October 2022).

The Swedish Higher Education Authority (2020), available at: https://english.uka.se/ (accessed on 13 October 2022).

Thomas, I. (2009), "Critical thinking, transformative learning, sustainable education, and problem-based learning in universities", *Journal of Transformative Education*, Vol. 7 No. 3, pp. 245-264, doi: 10.1177/1541344610385753.

United Nations – Department of Economic and Social Affairs (2022), "Sustainable development. Transforming our world: the 2030 agenda for sustainable development", available at: https://sdgs.un.org/2030agenda (accessed on 13 October 2022).

About the authors

Christel Persson is University Lecturer in Science education and Docent in Science education for sustainable development at Kristianstad University. Her current research focus on Earth System Science and teaching and learning in higher education. Christel Persson is the corresponding author and can be contacted at: christel.persson@hkr.se

Daniel Einarson is a Senior University Lecturer and has PhD in Computer Science. He is Program Coordinator for the Master Program "Applied Computer Science for Sustainable Development".

Maria Melén work as an Academic Developer and has a background as a Senior Lecturer in Organizational psychology. Her current research focuses aspects in higher education development.