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A generic model for integrating ESD in a university course – complementing a textbook with contemporary material¹

Abstract. A large number of stakeholders are demanding more education for sustainable development (ESD) at Swedish universities, among them students who are expecting to find ESD in their courses. The aim of the article is to present a model for how to develop a course to include ESD when no updated textbooks are yet available and Bloom's taxonomy is used for demonstrating the high level of learning that can be achieved without any syllabus changes. The setting for the case study and model development was a course in service marketing with a diverse group of students in terms of their background and education, at Umeå School of Business, Economics, and Statistics at Umeå University in Sweden. The course took place in the middle of the education program. Techniques such as lectures, guest lectures, assignments based on the theoretical textbook content, and a term paper were used to incorporate ESD into the course in order to accomplish possibilities for generic use. A challenge in designing ESD was the lack of knowledge about the students' initial understanding of sustainability. The model was designed to take this into account. The design of assignments showed clear possibilities of achieving high levels of learning in terms of Bloom's taxonomy, including analysis, synthesis and evaluation. The model is also an endeavor to encourage university teachers to introduce elements of ESD in their usual courses.

Keywords: sustainable development, higher education, education for sustainable development, Bloom's taxonomy

JEL Codes: M1

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1. Introduction

Several stakeholders call for efforts to make sustainability present in university courses, one of which is the United Nations (UN). On 25 September, 2015, all UN members adopted a resolution containing 17 sustainable development goals (SDG) (United Nations, 2015). But already a decade before this agreement, UN had dedicated the time between the years 2005-2014 to focus on education for sustainable development (SD), as stated in the report “Shaping the Future We Want – UN Decade of Education for Sustainable Development” (UNESCO, 2014). A decade was too short a time for achieving the goals; there was some progress in educating for sustainability but much more needs to be done and the pace still has to be increased (UNESCO, 2014). In order to make education more fruitful in terms of the SDGs, UNESCO (2017) prepared a report detailing what needs to be learned in order to achieve the SDGs. The aims of education for sustainable development are explained in another UNESCO publication (Leicht, Heiss, & Byun, 2018, p. 25), in the first chapter devoted to target 4.7: “By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through Education for Sustainable Development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development” (United Nations, 2015, p. 17).

The idea of integrating SD into university education is far from a novelty in the context of Swedish universities. Already in 1992, the following principle was established for Swedish universities: “In their activities, higher education institutions shall promote sustainable development, which means that current and future generations are ensured a healthy and good environment, economic and social welfare and justice” (5 § Högskolelag, 1992: 1434, translated by the author).

The task of educating for sustainable development (ESD²) imposed on Swedish universities has left some footprints in the university system; for example, the

² ESD can be derived from UNESCO (2004) and UNESCO Education Sector (2005) in latter articles a definition of ESD has developed, e.g., Yarime et al. (2012) “utilizing all aspects of public awareness, education, and training to create and enhance an understanding of the linkages among the diverse issues of sustainable development, of which the objective is to develop the knowledge, skills, perspectives, and values that will empower people of all ages to assume responsibility for creating and enjoying a sustainable future” (p. 104). A definition that has been challenged by Tikly et al. (2020) who want to define ESD as “access to a good quality education for all that can facilitate existing and future generations of learners across the lifespan, in formal and informal settings, to realise the rights, freedoms and capabilities they require to live the lives they have reason to value and to protect and co-evolve in a more harmonious relationship with the natural environment of which human beings are an integral part so that natural and social systems may flourish.”

vision of Umeå University states the following: “Conduct research and doctoral education that contribute to increased knowledge of sustainable development. Reach out to society for collaboration, participate in public debate and disseminate knowledge and good examples of sustainable development” (Umeå University, 2020). The aim of the vision for Umeå University has also become known at the level below the university administration, for example Umeå School of Business, Economics, and Statistics (USBE) clearly states in its vision the importance of sustainability: “Through interplay with surrounding society, we provide education and research that contributes to the understanding, ability, and responsibility of individuals in relation to societal challenges and the importance of sustainable development” (USBE Vision, 2020).

Despite these guidelines to integrate SD into higher education institutions (HEI) in Sweden, the pace is too slow. Finnveden et al. (2020) scrutinized all 47 HEIs in Sweden in terms of their efforts in this regard and found that less than half had well-developed processes for the integration of SD in education. Brorström and Pahlsson (2019) arrived at the same conclusion regarding the contribution of universities and colleges regarding SD. The heading of their report is “Much is done, much more needs to be done”, which is a very good way to summarize their conclusions.

One important group of stakeholder includes students, who are the ones to learn, to be educated for sustainability (ESD). Their motivation determines their ability to learn (Eppler & Harju, 1997). A survey of students attending the course that was used as a case study for this article was conducted in February 2020, (unpublished material) clearly showed their wish for the inclusion of sustainability in the studied courses. 4 out of 5 students expressed agreement or strong agreement with the following statement: “It is very important for me that the modules³ in my education address sustainability”, which is evidence of a strong expectation on the part of students to receive ESD in every university course they take.

As stated above, there is pressure on individual teachers to incorporate sustainability in their course(s). In order for course material to be as relevant as possible, it needs to be directly related to what happens in society. This article describes a proposal of a model for how to include contemporary material in a university course. The proposed model should make it possible to include materials for ESD without the need to change the syllabus. Since the model can be used without the support from the syllabus, individual teachers have more freedom to start ESD and to incorporate activities related to contemporary SD. Another intention of the model is to offer suggestions on how to integrate the SD component into a given course so that it is not perceived by students as an unrelated addition.

³ In this case, the term ‘module’ is equivalent to ‘course’.

There are additional reasons in favor of having such a model. Given the swift pace of development observed in society regarding sustainability, it is difficult to keep textbooks up-to-date by including material reflecting the present status of SD in society. On the other hand, students need to be exposed to current situations taking place in society regarding SD (experiential learning) in order to develop their learning ability (Boström, Winka, & Boström, in print).

2. Design of the study

The article reports the results of a case study and is based on firsthand experience of incorporating sustainability into a university course. The course in question is an advanced course in services called Service Management, which is offered by the department of business administration at USBE, which is part of social science. When students start to the course, they are in the middle of their education, beginning their fifth semester. The Study Programme in Business Administration and Economics lasts 8 semesters and a master degree program lasts 10 semesters. The Service Management course is attended by students with various educational backgrounds, but about 40% are students of Service Marketing, which is dedicated for those studying services. The second largest group of participants (30%) in this course consists of international students. Other students come from independent courses (non-program courses). Since the course is also open to international students it is given in English, which is the language of instruction. Usually, there are 2-4 participants who are native English speakers; for the majority of students this is their first course in English. The course is usually attended by 70-80 students.

To demonstrate the ability of the proposed model to offer significant levels of student learning, Bloom's (1956) taxonomy was used, see Fig. 1.

The basic level in the triangle is **knowledge** that the student has in a given area, which involves the recall or recognition of processes, terms etc. **Comprehension** means that the student has passed the level of just knowing facts and can now interpret (translate, extrapolate) facts in a given situation. At the level of **application** the student can apply general principles or methods to a specific context. At the level of **analysis** the student is expected go beyond applications and try to see patterns in order to solve problems or to deconstruct a complex situation into its constituent parts and understand the relationship between them. At the **synthesis** level the student should be able to create new theories or make predictions based on certain facts. This level involves the ability of putting together parts to make a whole. The top level of the pyramid is **evaluation**, where the student should be able to assess information and understand its value and

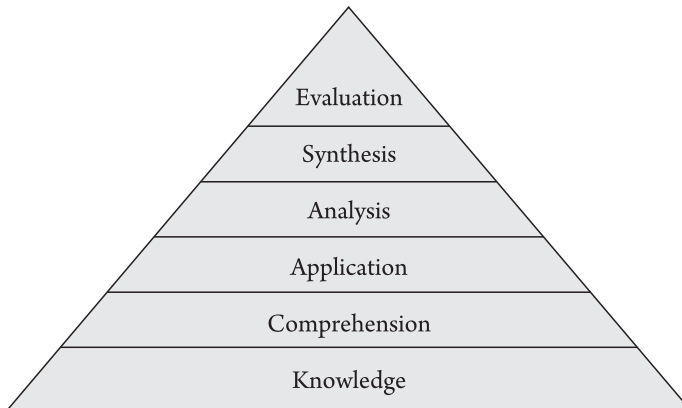


Fig. 1. An illustration of Bloom's classification of learning objectives into levels of complexity and specificity

Source: author's work based on Bloom (1956).

potential biases behind it, making judgements about the value of materials and methods.

The purpose of using Bloom's taxonomy is to demonstrate that the proposed model can provide significantly high levels of student learning, which involves advancing on the scale of Bloom's taxonomy to reach to the levels of applying, analyzing and evaluating (Bloom, 1956). In other words, the goal is to give students an understanding that goes beyond the functions of the analytical tools – models from the book – and instead focus on applied understanding so that they can articulate appropriate and applicable questions (cf. Hopkins, Raymond, & Carlson, 2011).

3. The Environment – University and Business School

Umeå School of Business, Economics and Statistics (USBE), founded in 1989, is a business school at Umeå University. USBE students come from a variety of places, with only one third originating from the northern parts of Sweden. Thus, its catchment area includes the whole of Sweden as well as foreign countries. There are about 3,000 students enrolled in one of 12 study programs or 165 courses offered at USBE and in 2018 there were 172 exchange students. This mix of students is naturally reflected in individual courses given at USBE.

USBE has a strong sustainability profile, which is strengthened by its membership in the Association to Advance Collegiate Schools of Business (AACSB)

and the fact of being an advanced signatory of PRME (Principles for Responsible Management Education), as well as being certified according to the environmental management standard ISO 14001 and the specific policy for sustainable development. Moreover, the school has an organization that signals the importance accorded to sustainability: a dean that actively promotes sustainability, a sustainability council (including a student representative)⁴, an administrative manager, who also serves as sustainability coordinator at USBE, a head of teaching and learning clearly devoted to sustainability and a career center coordinator in charge of alumni work with an outspoken interest in sustainability. Thus, the setting at USBE strongly supports activities related to sustainability (see also Boström, Winka, & Boström, in print).

In order to appreciate the situation of students participating in the course it is necessary to know the range and nature of educational programs offered at USBE. The Study Programmes in Business Administration and Economics are the most popular ones, not only with USBE students but also generally in Sweden; they prepare students directly for work in business or in the public sector. After completing one of these programs, students can apply for positions in the business sector, in the public sector or start their own business (cf. Filho & Pace, 2016).

4. Course activities addressing sustainability

Below, different parts of the course with a significant portion of sustainability are presented. The following activities were used: an introductory lecture, regular lectures, a guest lecture, an application-oriented assignment and a term paper. The goal was to use general activities that can be found in most courses. The activities were designed to be assignments in one or another way related to the SDGs.

4.1. Introductory lecture

The purpose of the introductory lecture was to set the tone for the course and communicate its clear focus on SD. Two specific topics regarding SD were addressed: the SDGs and definitions of sustainability, with an explanation of their role and background. The importance of defining sustainability has been pointed out by several authors, e.g., Bolis, Morioka, & Szelwar (2014), Filho (2015). Brundtland's definition and the triple bottom line approach to sustainability were presented. The use of two definitions was to make students aware of the complex-

⁴ This representative is a member of the student association HHUS, which is a volunteer association for all students at USBE.

ity involved in defining sustainability. Another intention was to present sustainability as an example of a wicked problem, e.g., Tikly et al. (2020). However, the definitions given in the introductory lecture were critically addressed later in the course. Time constraints and uncertainty about students' knowledge in the area of sustainability were the main reason for this approach.

In addition to defining sustainability, the SDGs were briefly introduced, including their background. Some time was spent presenting the targets for each of the 17 SDGs.

4.2. Regular lectures

The lectures can be regarded as a basic tool that facilitates the application and integration of sustainability approaches. Another benefit of the lectures was the possibility to enter into a dialogue with the whole group of students. These dialogues also provided an indication of how much the students understood; they were a built-in feedback about the teaching and the assignments in the course – a kind of formative evaluation.

The lectures were the opportunity for introducing different assignments. This was done intentionally so as to make sure that the students understood the assignment and to avoid speculations about how to interpret the assignment instructions. Moreover, it was a way of giving the students a possibility for asking questions directly about the assignment as well as it was a learning occasion for the teacher to understand where the ambiguities were in the description. Surprisingly there were very few questions about the assignments when they were presented; the questions tended to come later on.

4.3. Assignment – guest lecture

The course featured a guest lecture given by a person from the property and facilities office at Umeå University. The lecture was devoted to sustainability regarding property and facilities at Umeå University and was followed by two tasks for students: an individual assignment and a two-step group assignment.

The individual assignment. After the guest lecture each student was asked to respond to some questions about the lecture and hand in their written answers. Among these questions was also one about good study spaces at the university. Each student was to exemplify one of these spaces by naming it and explain what characteristics made it to a good place to study at. The main purpose for these questions was, however, to ensure that the students had grasped the key points of the lecture and to give them a chance to reflect on the issues addressed by the lecturer from the perspective of a good work environment – SDG 8. The lecture was recorded so non-attenders could benefit as well.

Group assignment step one. After the lecture the students were asked to identify three good and three bad spaces at the university in terms of sustainability using the SDGs as evaluation criteria and the part of the textbook which provides guidelines for how to design physical spaces in order to communicate what the organization stands for. For each example of space, the students had to come up with three arguments derived from the SDGs. As additional support for their arguments the students were expected to look for three different peer-reviewed articles that could support at least some of their arguments. In order to make the work easily accessible, each group of students filmed their selected spaces, including their arguments. Each group had to present their film at a seminar and to respond to questions from the audience.

Group assignment step two. After the seminar where students' films were presented, each group of students had to comment on another group's examples of bad spaces. For each "bad" example, they had to develop three suggestions of improvements. These improvements should be founded in the SDGs.

4.4. Assignment – applying a model from the textbook

The students had to refer to the sections of the textbook about managing an innovation process. This assignment was connected to SDG 9 and more specifically CO₂ emission and consisted in proposing a service that could help to diminish CO₂ emissions. Three dimensions were presented for assessing the impact of the proposed innovation: Efficiency – how efficient the service would be in reducing CO₂ emissions; cost effectiveness – its cost per ton of reduced CO₂ emission; and credibility – how realistic is the innovation? The first part of the assignment was to make a pitch for the proposed innovation in the form of a 60-second video. Each group had to show their film at a seminar and respond to questions from the audience. After the seminar all videos could be accessed by all student groups. In the second part, the students were asked to adopt the role of investors using the criteria presented above. Their assignment was to identify and rank the top five innovations.

4.5. Assignment – term paper

The goal of the term paper was to identify an organization or company that has the outspoken ambition of addressing one or more of the SDGs or any of their targets. The first task was to describe actions taken by the organization to implement this ambition. The second task was to analyze/describe how the organization communicates this ambition. This part of the assignment there was clearly outlined in the textbook. In the third part, the students were supposed to analyze

how this ambition fits in with the organization's history. The final question was whether the communication was consistent, which required students to analyze different communication channels (various types of social media, multilingual website content, etc.).

The term papers were presented at a seminar. After each presentation, another group was assigned the role of a reviewer. To facilitate the review process, the students had been given evaluation criteria for the term paper, which they could use at their discretion.

5. Discussion

The inclusion of sustainability topics in the course can be described as applied – e.g. applying the SDGs and the textbook in different ways to achieve ESD. The textbook served as a tool providing concepts and models which were applied in different ways in the context of sustainability. This approach was selected because it was a fruitful way of reflecting on how organizations and companies today work with sustainability from the perspective of the concepts and models presented in the textbook. It also encouraged critical and reflexive learning.

Below, each one of the assignments is discussed in relations to Bloom's taxonomy (1956) to give the reader an idea about how a university course can include the ESD component without any syllabus support. Lectures are not discussed as they are seen as preparations for assignments.

5.1. Assignments related to the guest lecture

In the **individual task**, students should **analyze** spaces at the university. **The first group assignment**, where students were asked to identify good and bad spaces at the university from the perspective of the SDGs, can be regarded as relating to the level of **application and analysis**. In the **second group assignment**, where the task was to comment on another group's choice of "bad spaces" and suggest improvements, the students had to understand how another group had interpreted the SDG(s) in their classification of bad spaces and to **analyze** how the spaces could be improved in accordance with the SDGs.

5.2. Assignment – applying a model from the textbook

The first part of the assignment was about **applying** the framework provided in the textbook to create a service innovation. The second part required skills of

synthesis in order to create something new by putting together elements indicated in the textbook. Since the last part of this assignment required the use of three criteria, there was also an element of **evaluation**.

5.3. Assignment – term paper

The term paper assignment was designed to practice **evaluation** skills, which correspond to the top level of Bloom's taxonomy. The peer review of another group's work was also an example of an evaluation task.

When the assignments are analyzed in terms of Bloom's taxonomy (1956), it is evident that most of them demanded the use of higher level learning skills. They show that it is possible to design complex and challenging tasks related to SD and the SDGs and include them in a course without altering the syllabus and without waiting for textbooks to be updated with relevant examples.

5.4. Uncertainty about students' knowledge about sustainability

As a first-time experiment, the proposed ESD component was faced with the challenge of trying to assess the level of students' knowledge in the area of SD, given that the topic had not been previously included in the course. Although sustainability is present in many courses, it is hard to be sure how this presence translates into actual knowledge. In other words, to borrow Entwistle's term "threshold concept" (Entwistle, 2009), it is difficult to set the appropriate starting level.

It was assumed that students at the start of their 5th semester were already familiar with the SDGs. However, there was also a substantial group of international students with varying levels of knowledge regarding the main topic and SD. The group assignments were designed to minimize these differences, by providing opportunities for collaborative work and discussions between group work (Elmgren & Henriksson, 2016).

6. Conclusions

The aim of this article was to demonstrate how to incorporate ESD into a university course. The proposed suggestions can be implemented without any changes in the syllabus. The actual course described in the article had a syllabus that supported the task related to sustainability. However, modifications and improvements introduced into the course may well have been done without any support from the syllabus for that specific course.

The possibility of making a successful change in a course is naturally facilitated by institutional support. In this case, Umeå University promotes sustainability in its vision as does the Business School, which includes it in its mission statement. Of course, this support for work on sustainability helps but the demonstrated changes can be scaled, which means that the amount of ESD presence can vary depending on the system's maturity and students' knowledge. Thus, the learning outcome in the syllabus is no guarantee of a high level of learning, according to Bloom's taxonomy.

A model for starting or developing ESD in a course without syllabus changes.

The following is a list of actions that can be taken to transform a course by including elements of ESD or to enhance the ESD component within a course. These actions can be treated as a model for such a transformation and can be modified to suit the needs of an actual course. The objective of the lectures is to provide foundations for the subsequent work.

1. Start talking about sustainability during the introductory lecture, e.g. by presenting the SDGs and definitions of sustainability.

2. Ask other lecturers teaching the course to address sustainability. A guest lecture is also a good way of providing contemporary knowledge about sustainability.

3. Ask the students to reflect on what sustainability would mean in relation to a central concept/model from the textbook.

4. Try to apply a model from the textbook in the context of sustainability. Depending on students' experience with ESD, adapt the assignment level accordingly. A good way of exploiting the potential of such assignments is to let students evaluate each other's work. It is especially interesting if they get to judge the work of several other groups and rank them according to SDGs.

5. The term paper is probably an assignment with the greatest degree of freedom regarding design. Also, students are expected to work at the highest level of Bloom's taxonomy – evaluation.

The above model is intended to serve as a tool for setting and stimulating the mind when ESD is to be introduced in a course or elaborated. The steps of the model should be treated as suggestions about how to think when working with ESD. Remember to consider students' knowledge about sustainability. They need to have a threshold level of knowledge in order to be able to understand and relate to what is being presented. Also, they are likely to be more interested in the topic if they find the presented material accessible.

It would be interesting to assess and analyze the effectiveness of these activities from the perspective of student learning and how they can be improved. In the coming year the author intends to hand out information about all assignments at the beginning of the course instead of handing them out in succession.

An important area that needs to be addressed in the future is the level of students' knowledge about sustainability. It would be very helpful to have a tool for assessing the level of their knowledge about SD; it would help in designing a course that is better tailored to students' needs concerning sustainability.

Another change for the future is to work more with definitions of sustainability and to challenge students' understanding by problematizing the definitions and expose them to normative criticism, (cf. Tikly et al., 2020). Another interesting area worth exploring is how students' performance in assignments changes over time.

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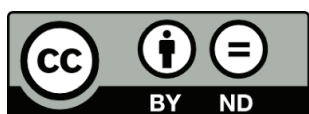
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Ogólny model integracji edukacji na rzecz zrównoważonego rozwoju w ramach kursu uniwersyteckiego – uzupełnienie podręcznika o aktualne treści

Streszczenie. Liczne podmioty, w tym także studenci, domagają się większego udziału edukacji na rzecz zrównoważonego rozwoju (EZR) na szwedzkich uniwersytetach. Celem artykułu jest przedstawienie modelowego sposobu opracowania kursu uwzględniającego EZR w sytuacji braku zaktualizowanych podręczników, bez żadnych zmian w programie, jednak przy zapewnieniu wysokiego poziomu uczenia się, zgodnie z taksonomią Blooma. Zaprezentowane w artykule studium przypadku i proponowane zmiany dotyczą kursu marketingu usług dla grupy studentów różnicowanej pod względem pochodzenia i wykształcenia w Szkole Biznesu, Ekonomii i Sta-

tystyki na Uniwersytecie Umeå w Szwecji. Kurs odbył się w połowie programu edukacyjnego. Elementy EZR zostały wprowadzone za pomocą wykładów, wykładów gościnnych, zadań opartych na treściach podręcznika teoretycznego i pracy semestralnej. Wyzwaniem w projektowaniu komponentu EZR był brak informacji na temat początkowego stanu wiedzy studentów w kwestii zrównoważonego rozwoju. Modelowe podejście zostało opracowane w taki sposób, aby uwzględnić tę niedogodność. Zastosowane formy zadań pokazały możliwości osiągnięcia wysokiego poziomu uczenia się według taksonomii Blooma, w tym analizy, syntezy i oceny. Modelowe podejście jest również próbą zachęcenia nauczycieli akademickich do wprowadzenia elementów EZR do swoich zajęć.

Słowa kluczowe: zrównoważony rozwój, szkolnictwo wyższe, edukacja na rzecz zrównoważonego rozwoju, taksonomia Blooma



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