



Personal **Green Skills** in
Higher Education



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Sustainability at HEIs: Mapping Good Practices

Report of the Erasmus+ KA2 project Personal Green Skills in Higher Education
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- Technical University of Applied Sciences Würzburg-Schweinfurt (THWS), Germany

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Abstract

Global climate change is a cognitive challenge for many people and often evokes negative associations due to its complexity and interactions with politics, social movements and economic developments. Therefore, the possession of green skills becomes central to the fight against climate change. The European Council conclusions recognize this urgency and underline the need for a transition to green skills. This recognition also extends to higher education, where institutions have a crucial role to play in tackling the climate crisis. Personal Green Skills in Higher Education (PeGSinHE) is an Erasmus+ KA2 project coordinated by Kauno Kolegija (KK, Lithuania), Tampere University of Applied Sciences (TAMK, Finland), Hochschule für Agrar- und Umweltpädagogik (HAUP, Austria), Universidad de Málaga (UMA, Spain) and Technical University of Applied Sciences Würzburg-Schweinfurt (THWS, Germany). The strategically designed project aims not only to promote green skills among students and encourage personal behavioral change in line with the Sustainable Development Goals, but also to instill a sense of social responsibility in the partner institutions. The focus is on empowering lecturers at partner universities through innovative teaching and learning methods to effectively impart green skills to students. This report describes the objectives and methodology used to assess environmental and sustainability competencies in the higher education institutions involved in the project. Methodologically, the report uses an assessment template designed to provide a comprehensive overview of best practice and baseline levels of environmental and sustainability competencies. It advocates the involvement of key stakeholders from all five partner Higher Education Institutions to ensure a broad perspective on these practices and competences within their respective countries and organizations. Different methods and perspectives will be used to collect data to enable a holistic understanding of the topic. The joint completion of the assessment template serves as a catalyst for joint discussions on the level of environmental and sustainability competencies and the identification of best practices in each organization. The results show that national implementation strategies are relatively loose, although some competency descriptions set targets for undergraduate degree programs. Challenges faced by higher education staff include resource constraints, particularly lack of time, the need for a deeper understanding of sustainable development and pedagogical tools, and the need for improved opportunities for collaboration. Given the time and resource constraints of this study, the results must be considered preliminary. Nevertheless, they confirm the findings of previous studies.

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1 Project Overview

Personal Green Skills in Higher Education (PeGSinHE) is an Erasmus+ KA2 project coordinated by Kauno Kolegija (KK, Lithuania), Tampere University of Applied Sciences (TAMK, Finland), Hochschule für Agrar- und Umweltpädagogik (HAUP, Austria), Universidad de Málaga (UMA, Spain) and Technical University of Applied Sciences Würzburg-Schweinfurt (THWS, Germany). In the battle against climate change, the possession of green skills stands out as a pivotal factor. Acknowledging this urgency, the European Council's conclusions (8269/20) underscore the imperative to transition towards green skills. This recognition extends to the realm of higher education, where institutions play a crucial role in addressing the climate crisis. Our project PeGSinHE is strategically conceptualized to not only cultivate students' green skills and foster personal behavioral change in alignment with sustainable development goals but also to instill a sense of social responsibility within partner institutions, Higher Education Institutions (HEIs). Central to our approach is the empowerment of lecturers within partner HEIs through innovative teaching and learning practices, ensuring they become instrumental in transferring green skills to students.

The debates on green thinking and sustainability have led to a number of international documents and various educational initiatives. There are many attempts to introduce green skills into society in general and into education - from elementary school to postgraduate research activities. The main innovation of this project is that it is no longer teaching how to think and behave green, but shaping personal values and attitudes of the academic society. The partnership is convinced that green thinking as an ethical value is the cornerstone for behavioural changes that are essential for a more sustainable way of life. The role of educational institutions is not only to pass on knowledge and experience to young future professionals, but also to promote the development of personality. This project aims to address the fundamental assumptions about 'right' and 'wrong', 'good' and 'bad' in order to provide both students and lecturers with knowledge and insight into ethical aspects of sustainability.

Developing a positive attitude towards green thinking is important for the academic community, especially for students as they are the future shapers. Sustainability and green skills are overarching and elementary topics that should be integrated into universities. In order to increase the handprint of HEIs, it is crucial to focus on developing students' general skills, their attitude and mindset towards sustainability, as well as developing green competences of academic staff through training and research. Finally, greening higher education facilities increases the competitive advantage and helps to attract good lecturers and motivated students.



1.1 Objectives

The overall aim of the project PeGSinHE is to improve students' green competences and promote their personal behavior change in line with the Sustainable Development Goals (SDGs) while strengthening the essential competencies of lecturers in higher education institutions. To effectively address the identified needs, the project activities and objectives are tailored to develop a methodology for personal green skills and integrate them into staff training and the academic curriculum.

By incorporating basic behavioral values related to sustainability and green initiatives, the main target group, namely students, will acquire knowledge through the blended intensive program (BIP) and subsequently through extended study modules. This knowledge will then be applied in their daily lives as well as in their professional activities. At the same time, the secondary target group, the lecturers, will use the knowledge gained through the train-the-trainer activities to pass on the knowledge to their colleagues through local training initiatives and engage with the local community through multiplier events. With this comprehensive approach, the project seeks to effectively meet the diverse needs of all target groups and thus promote holistic change towards sustainability within HEIs. In detail, this project pursues the following objectives:

- O 1** - Mapping good practices and developing a common methodology on personal green skills in HEIs.
- O 2** - Enhancing the personal green skills of lecturers and students.
- O 3** - Encourage the incorporation of personal green skills in teaching methods, study process and personal life.
- O 4** - Promote to society a better understanding of personal green skills.

Figure 1 below illustrates the project approach. The project consists of five interlocking work packages, each led by one of the partner universities. The approaches focus on identifying and promoting green skills through teaching formats and train-the-trainer workshops. The aim is to sensitize students to sustainability issues and enable teachers to integrate them innovatively into their teaching. The work packages contribute to achieving the project goals through specific tasks and activities. A clear assignment of tasks to the work packages ensures an efficient process.



1 Project Overview

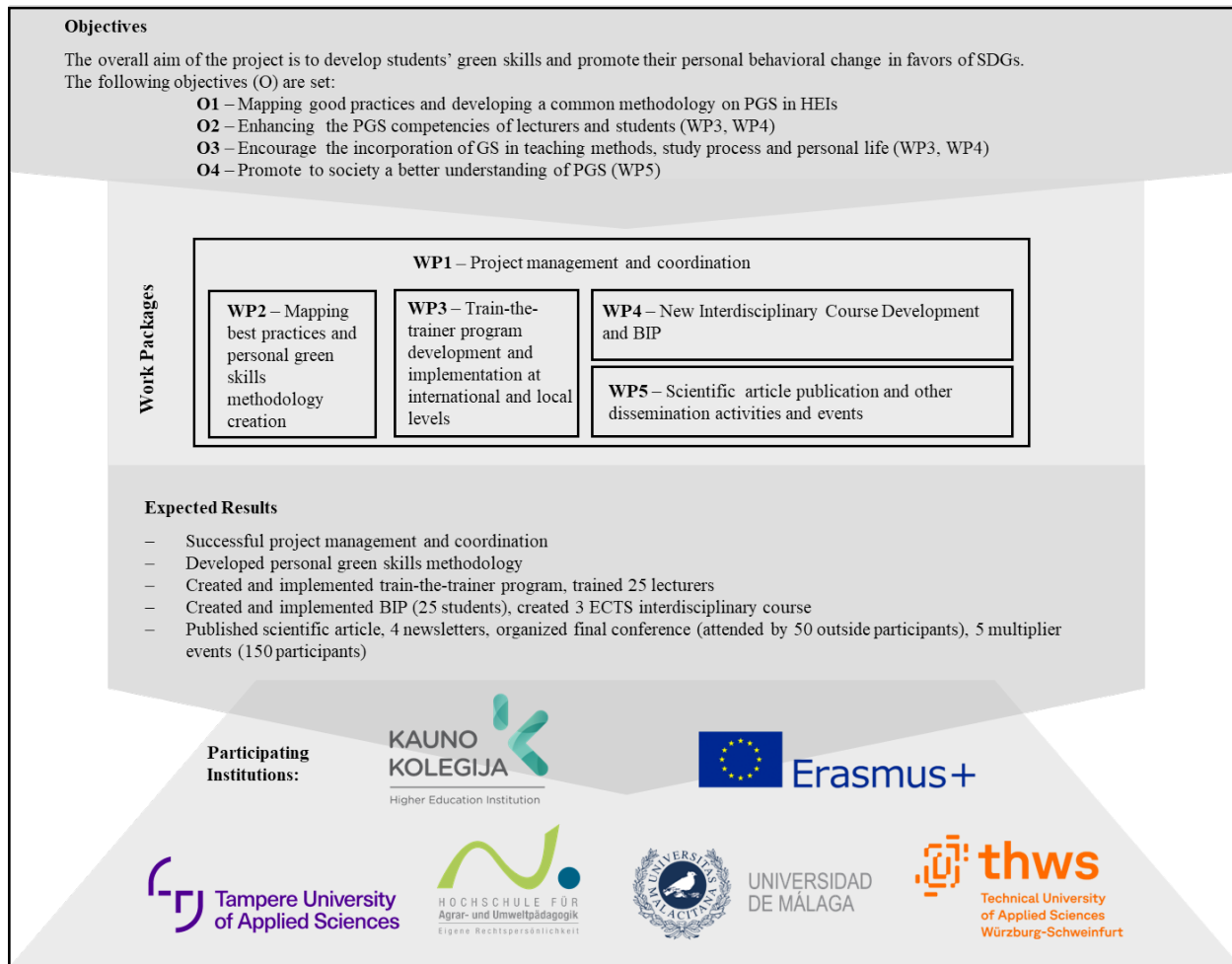


Figure 1: An overview of the Erasmus+ project PeGSinHE. There are four objectives (O1-O4) planned, whose achievement is taken into account by work packages WP 1-5.

1.2 Work Package 2

TAMK (Tampere University of Applied Sciences) led Work Package 2 and developed this report in collaboration with all partners. In this report, we describe the objectives and methodology used to assess sustainability competences at the HEIs participating in the project. Work package 2 aims to establish a solid foundation for developing and integrating green skills within Higher Education Institutions (HEIs).



The following specific objectives (SO) are the goal of work package 2:

SO 1.1: Define green skills within the context of higher education.

SO 2.2: Define the institutional baseline for green and sustainable strategies, policies and programs in each partner university.

SO 3.3: Define the personal green competences of students and lecturers and their development.

SO 4.4: Elaboration of the methodology and process for the development of personal green and sustainable competences for students and lecturers of HEIs.

Our comprehensive approach includes a variety of activities to achieve the specific objectives. Firstly, we will start by defining the range of green competencies that are essential for promoting sustainability in HEIs. This involves categorizing the competences according to their quality, distinguishing between hard and soft skills, quantifying their level on a scale of 1 to 5 to measure the competence, and distinguishing their depth, whether general or specific. The distinction we have made between these skills is closely aligned with established frameworks such as the European Union's Green Competencies (GreenComps) and the definitions of the United Nations Industrial Development Organization (UNIDO).

Subsequently, our efforts will focus on conducting an in-depth assessment of the current landscape of green and sustainable skills at our partner universities. This will involve a thorough investigation to identify prevailing best practices and establish a baseline level of green competencies at each institution. From this analysis, we aim to identify specific training and development needs while gaining a clearer understanding of initial competency levels in green skills.

To complement our analysis, we will convene focus groups with students and faculty and distribute pre- and post-survey questionnaires. These surveys will be strategically synchronized with the activities described in work packages 3 and 4 to track the development of personal green competencies. By correlating the questionnaire data with the project activities, we hope to gain valuable insights into the effectiveness of our skills development initiatives.

Finally, with the comprehensive data and findings, we will dedicate ourselves to devising a robust methodology and process framework tailored to the HE context. This framework will serve as a blueprint for the seamless integration of green skills into existing academic structures. By providing a structured approach, we aim to enable HEIs to effectively promote and cultivate green skills among students and faculty.

At its core, our efforts in WP2 aim to catalyze a paradigm shift in higher education by fostering a culture of sustainability through the intentional development and integration of green skills.



1.3 Data Collection

The report is based on qualitative desk research conducted at all partner universities. The team at the University of Applied Sciences in Tampere developed the template for mapping good practices and baseline levels of green and sustainable competences at the participating universities. The template is based on the template used in the EduSTA project and has been tailored to PeGSinHE to better fulfill the tasks set in the project. EduSTA is an Erasmus+ Teacher Academies (2022-2025) project aimed at creating a robust network of teacher education institutions to promote educators' roles in ecological transition through collaborative development of competencies and educational pathways, leading to sustainable international collaboration. Coordinated by TAMK, it includes partners from Sweden, the Netherlands, the Czech Republic, and Spain. The adapted template is divided into three parts:

- Part A 1:** The status of green and sustainable skills in HEIs. This part aims to gain a general overview of the baseline level of green and sustainable competences in HEIs at national level and in the partner organizations. The questions address the definition and application of policies, guidelines, strategies and ways of recognizing or rewarding education for sustainable Development, as well as networks and partnerships that support the professional development of teachers in Education for Sustainable Development (ESD).
- Part A 2:** Good practices and challenges related to green and sustainable competences in higher education institutions. This section aims to provide a general overview of good practices and challenges related to green and sustainable competences in the partner organizations.
- Part A 3:** Reflection. This section asks for respondents' thoughts and reflections on the professional development needs of ESD educators in their organization.

The links to the templates were sent to the project leaders of the partner organizations on 8 March 2024. The response period lasted until the end of March 2024. All partner organizations responded to the mapping. The responses were written by 1-3 people with different positions in the organizations. This means that the responses may not provide a complete picture of the status quo. Nevertheless, together with the background literature, they provide a reliable starting point for the development of the methodology.



2 Theoretical Background

Green Skills in Higher Education

Several competence frameworks have been developed to describe the Key Sustainability Competences (KSC) that are essential for addressing complex sustainability challenges [1, 2, 3]. At the same time, a growing understanding of the need to concretize and operationalize the KSC has been articulated (e.g., [4]). One of the most concrete competence frameworks is the GreenComp, which takes a lifelong learning perspective and defines the competences that European citizens should have in order to work towards the green transition in the context of the European Green Deal initiative [5]. Therefore, GreenComps is used as a background theory for the methodology of personal green competences in higher education developed in this project.

GreenComps consists of 12 competences divided into four competence areas. Embodying sustainability values includes valuing sustainability, supporting fairness and promoting nature. Grasping complexity in sustainability: systems thinking, critical thinking and problem solving. Envisioning a sustainable future, including future literacy, adaptability and exploratory thinking. Acting for sustainability includes political action, collective action and individual initiative [5]. When adapting GreenComps in higher education, two perspectives can be taken: firstly, the perspective of the personal skills of the bachelor students (according to the definition of the project, professional skills are not part of this project) and secondly, the green skills of the employees. A helpful tool for defining the green skills of students is the definitions of the general competences of graduates. In Finland, the Rectors' Conference of Universities of Applied Sciences has defined the competences of bachelor graduates in the field of sustainable development as follows:

- The graduate is familiar with the principles of sustainable development, is committed to their implementation and acts responsibly as a professional and member of society,
- He/she is able to use information from his/her field of specialization to find, implement and establish sustainable solutions and operating models,
- Understands the challenges of sustainability, their interdependencies and the different aspects of issues and problems [6].

This definition encompasses all perspectives of GreenComps, places the professional competences in the subject that the students are studying and emphasizes the competence to deal with complexity.

The sustainability competencies of teachers are directly related to the competencies that students should learn. Rieckmann (2012) has presented a general definition of teacher competence for ESD



as knowing, doing and being with two components:

1. Teacher as a vehicle for pedagogical change and the development of transformative learning experiences and
2. Teacher as a catalyst through which institutional learning and structural changes that support this can be driven better and faster [7].

These competences are consistent with the role of the teacher as an agent of transformative learning and change [8] in the HE institution. The most influential frameworks developed based on this definition and related to KSCs are the UNECE framework [9], the Curriculum, Sustainable Development, Competences and Teacher Training (CSCT) framework [10], A Rounder Sense of Purpose (RSP) [11] and KOMBiNE [12].

The UNECE (2012) framework defines competences with a matrix of two axes. The first axis contains three essential characteristics of ESD: Holistic Approach, Visions of Change and Realizing Transformation. The second axis contains four elements referred to as learning experiences: Learning to know, Learning to do, Learning to be and Learning to live together. The combination of these axes results in learning objectives for teachers' sustainability competences and a total of 39 competences [9]. The RSP framework is also organized around two axes: first, holistic thinking, visioning for change, achieving transformation; and second, integration, participation, practice and reflexivity [11]. Transformative pedagogy is closely linked to the implementation of the second axis [3]. The CSCT model uses three generic competences (teaching, reflecting/visioning, networking), five core elements of ESD competences (knowledge, systems thinking, emotions, ethics and values, and action) and recognizes the role of the teacher as an individual, as a member of an educational institution and as a member of society [10]. This model also illustrates the importance of embedding the dimensions of local-global and past-present-future in Education for Sustainable Development (ESD).

The Bicycle Model of Climate Education [13] is a practical model that combines teachers' competencies with the goals of developing green competences. Here, the bicycle represents the fact that in successful climate or green education, many things need to work well together to create movement and make a difference (see Figure 2).



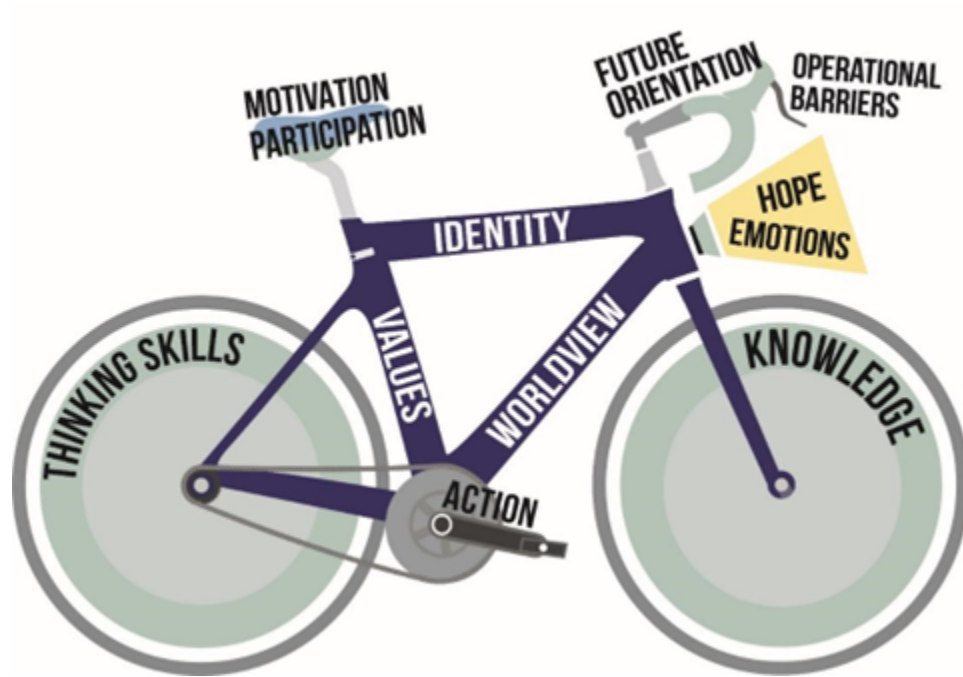


Figure 2: Bicycle model of climate education [13].

3 Pedagogical Approaches at Partner Universities

Among the partner universities, HAUP and TAMK have paid particular attention to the development of pedagogical approaches to promote Learning for sustainability. These can be used as a starting point for the methodology in the project. Green pedagogy at HAUP combines the implementation of the mission of ESD and the didactic theory according to Peterssen (2001). The following didactic principles characterize Green Pedagogy:

- An interdisciplinary approach to pedagogical content,
- A multi-perspective approach to ecological and economic topics,
- A targeted combination of expert knowledge for sustainable and economically sensible development with pedagogical-didactic knowledge,
- Process-oriented future strategies and problem solutions,
- Cultural sensitivity, value orientation and development of emotions,



- A variety of methods to promote autonomy, participation and shared responsibility,
- A holistic approach to practice, life, space, nature and culture,
- The linking of disciplinary and pedagogical knowledge with practice,
- A metacognitive approach to openness and contradictions [14].

As part of the EduSTA Erasmus+ Teacher Academies project, TAMK developed the sustainability skills of teachers in the form of assessable digital open badges. This work included systematic analysis of the above frameworks and review of gray literature, conducting expert interviews and organizing workshops for practitioners in five European countries as well as transnational co-design to define and design the badges. As a result of this process, nine teacher competencies were defined which describe the role of teachers in promoting students' sustainability competences. Each competency corresponds to a microbadge in the EduSTA badge constellation. We categorize the following types of competencies as relevant:

- Knowledgeable problem solver understands the background and purpose of the SDGs and how they relate to ESD in their educational context.
- Critical developer uses knowledge related to sustainable development, sustainability competences, ESD and national policies in the implementation of sustainable Development in education and in the critical development of teaching practices or curricula in their educational context.
- Complexity-aware is aware of complexity in their professional practice and discusses and reflects on uncertainties and contradictions with colleagues, students and the community.
- The promoter of systems thinking designs teaching and learning processes by using learning environments and methods that help students to understand broader systems and their interrelationships.
- Catalyzer of future thinking designs and implements teaching and learning processes that promote students' future thinking.
- Supporter of values awareness uses learning environments and pedagogical methods that help students recognize, evaluate, articulate, and reflect on their values.
- Active collaborator works together within and beyond their educational context to strengthen collaborative action for sustainability. They design and organize learning opportunities that stimulate and support students' collective action for a sustainable future.



- Conscious change agent reflects on institutional and professional policy and practice and strives for continuous personal and institutional learning in ESD.

In summary, the types of competencies for educators in the field of ESD encompass a variety of skills ranging from sound problem solving and critical development, awareness of complexity and promotion of systemic thinking, design of future-oriented teaching and learning processes, promotion of value awareness, active collaboration and conscious action as change agents. These skills aim to empower both teachers and their students to play an active role in shaping a sustainable future.

3.1 Policies, Guidelines and Commitments

Although the European Green Deal and Agenda 2030 guide all national policies to some extent, the way these policies are implemented in higher education varies greatly. Finland and Austria have quite similar strategic structures with government strategies, steering documents at ministerial level and national cooperation platforms to promote ESD. The Bavarian sustainability strategy defines goals and measures for sustainable development at Bavarian universities and the topic is regularly debated at parliamentary level (THWS).

In Spain, ESD is enshrined in the Education Act (LOMLOE) and there are several strategies for incorporating the principles of sustainable development into education at all levels (primary, secondary and university). These strategies are implemented by the Spanish government and also by the regional governments (Comunidades Autónomas) as well as by CRUE, the association of all Spanish universities. CRUE has a permanent working group on sustainability. Also in Finland, the Rectors' Conference of Finnish Universities of Applied Sciences (ARENE) and the Rectors' Council of Finnish Universities have published their commitments to promote ESD in higher education and ARENE has a standing working group on sustainability and responsibility.

In Lithuania, there are no strategies or policies that would directly target education for sustainable education or sustainability in higher education institutions in general. However, like all public institutions, we are obliged to produce a social responsibility report at least every two years. A National Agreement on Lithuanian Education Policy 2021 - 2030, in which the Lithuanian government takes responsibility for creating a sustainable (social, financial and emotional) environment in higher education.

3.2 Sustainability Best Practices

This project's baseline point concerned the definition of students' sustainability competencies. As the GreenComps provide a European framework, it is also important to know whether and how they have



been applied at universities so far. All universities promote sustainability competences, but the degree of governance through EU, national or organizational or policy documents varies greatly. The general answer is that GreenComps have not been systematically applied at an organizational level in any of the universities.

Nevertheless, the competences and principles described in GreenComps are an integral part of HAUP's pedagogical approach and are applied at program or course level at TAMK and UMA. At TAMK, the EduSTA project has further developed the framework for teachers' sustainability competence on the basis of GreenComp. In Germany and Finland there are guidelines or definitions for competences at Bachelor level.

In Germany, there are initiatives at national and organizational level to promote green and sustainable competences at Bachelor level, including a funded ESD program and the German Sustainability Code for Universities. These provide guidelines for integrating sustainability into curricula and activities without setting a uniform national target. Green and sustainable skills cover a wide range of competencies, including environmental issues, resource management and social responsibility, and are intended to prepare students for an active role in sustainable development. The response was accompanied by a long list of competences.

In Finland, there is a nationally agreed competence description for generic competences at Bachelor level. The document Recommendation on the shared competences of universities of applied sciences and their application 2022, published by the Rectors' Council of Finnish Universities of Applied Sciences (ARENE), defines the competences at Bachelor level in the field of sustainable Development. The same document also defines the following competences: Learning to learn, working in the workplace, ethics, internationality and multiculturalism, proactive development. Of these competences, ethics and proactive development in particular are related to GreenComps. Furthermore, in the last curriculum reform of TAMK, Sustainable Future was declared one of the four pedagogical principles and should be included in all Bachelor curricula.

In Spain, several competencies related to sustainability have been included in the official bachelor's degree programs of the Spanish government. Subsequently, they will be included in the specific competencies of each subject.

HAUP in Austria has been working on competences relevant to the labor market since 2007. At Bachelor's level, the curriculum is designed to teach a range of skills and promote professional awareness. These competencies include both subject-specific knowledge tailored to the respective professions and a heightened awareness of innovative and sustainable development trends, particularly in rural and urban areas. The focus is on the ability to critically reflect on topics from different disciplines embedded in an educational and consultative framework. This multi-faceted approach enables students to engage in reconstructive processes from a nuanced, multi-perspective viewpoint. As HAUP is a teacher training organization, the competencies also include definitions of green pedagogy.



There are no guiding principles or definitions of competencies in Lithuania. However, the KK institution describes skills that should be included in the definition. The main competences at Bachelor level should cover all three main areas: social, economic and environmental issues. The understanding of social responsibility and the concept of justice as well as the ability to model support measures for socially disadvantaged groups could be core competencies related to sustainability. Basic financial literacy could provide a good foundation for understanding micro- and macroeconomic trends, and knowledge of community-based business solutions and social entrepreneurship could also be useful.

The impact of daily actions on our environment and an understanding of ecological balance should form the backbone of green skills. In addition, the ability to define local production cycles and select sustainable products and services could be important.

3.3 Strategies and Organizational Guidelines

The descriptions of organizational commitment were compared with the levels of sustainability maturity described by ARENE in 2023 [15]. All partner universities have taken some action on sustainability management. However, the responses show that the maturity level of the organization in terms of sustainability varies from strategic (HAUP) to controlled (UMA, TAMK) to progressive (KK, THWS).

Kauno kolegija has set itself the goal of becoming a progressive and sustainable European higher education institution by 2025. Although sustainability is an important part of its vision, KK lacks a systematic institutional policy or specific guidelines for green and sustainable competencies. There is no designated sustainability officer and initiatives are usually driven by (inter)national projects such as the installation of solar panels. These efforts are documented in biennial sustainability reports and annual performance reports. KK is a member of the United Nations Global Compact, underlining its commitment to global sustainability principles. However, there are no institutional guidelines for the development of curricula and assessment plans related to sustainability.

At the Tampere University of Applied Sciences, sustainability and responsibility issues are seamlessly integrated into multidisciplinary education. The institution has established common learning outcomes that all graduates must master, including an international perspective and global responsibility. Sustainability is a central pedagogical principle in curriculum development to ensure that students learn to act sustainably and responsibly in their fields. This integration reflects a holistic approach to embedding sustainability into education.

Green and sustainable skills are firmly embedded in the strategies, policies and programs of HAUP in Austria. The curricula are based on the principles of green pedagogy and emphasize constructivist didactics that promote active learning and critical thinking. Students engage with economic, environmental and social challenges in a practical way and encourage a collaborative approach to problem



solving. The university's commitment to sustainability is underlined by recent awards such as the Sustainability Awards 2022, which recognize its innovative educational approaches and international collaboration.

THWS in Germany does not yet have an overarching sustainability strategy, but sustainability is an integral part of its strategic orientation. A comprehensive institutional sustainability concept is currently being developed and should be completed by the end of 2024. This strategy includes specific sustainability goals in the areas of teaching, research, administration and operations. Annual sustainability reports will document progress and plans are being developed to achieve climate neutrality by 2028. Although the pedagogical principles for sustainability in the curricula are still a work in progress, sustainability topics are already integrated into some degree programs.

UMA in Spain has established an Office of Sustainability that is committed to a carbon-neutral campus and promoting sustainable practices among students and staff. This office coordinates all sustainability-related activities and collaborates with an international cooperation office and a volunteer program to promote social justice. In addition, individual departments and faculties organize sustainability initiatives that aim to integrate sustainability into all university's activities.

The analysis shows a varying degree of integration and institutionalization of sustainability strategies at the individual universities. While KK and THWS are in the process of developing comprehensive sustainability frameworks, institutions such as Tampere, Austria, and UMA have already deeply embedded sustainability into their organizational and educational structures. This reflects the different approaches to sustainability, ranging from incipient strategic planning to fully integrated educational and operational practices.

4 Good Practices

This topic is treated as a whole, as the same types of good practices were described under different titles in the responses of the different universities. The chapter moves from in-depth practices to practical practices and covers the areas of education and research development and innovation in parallel.

4.1 Systemic Approaches

HAUP has the most holistic approach in pedagogy, as it is the competence center for Green Pedagogy and has been pooling its expertise in sustainable education and development for 20 years, training multipliers and cooperating with national and international educational and research institutions. Green



Pedagogy models learning arrangements for the constructive and solution-oriented treatment of economic, ecological and social "hotspots" in the areas of agriculture, resource conservation, lifestyle and consumption for educational and advisory professional practice. Green pedagogy places development and thus processes at the center of learning. Green pedagogy concretizes education for sustainable development by offering didactic orientation for practice. It focuses on learning processes that deal with the dilemmas of sustainability education. The approach integrates a case study to show that a digital learning environment on the SDGs requires the interweaving of values and knowledge as well as the reflection of subjective theories.

The project "Sustainability Goals according to the concept of green pedagogy analog and digital teaching and learning" provides an example of in-depth work. In addition, TAMK has developed a holistic approach to teachers' sustainability competencies as part of the EduSTA project and has designed digital, open, badge-driven learning pathways for teachers' sustainability competencies, but the application is still ongoing. UMA reports that environmental education and sustainable development goals are an essential competence in teacher training.

In TAMK, sustainable RDI activities are a part of systematic efforts to promote sustainable development in line with TAMK strategy and organizational commitment to sustainable development. TAMK is committed to sustainable RDI activities that are planned, implemented and evaluated with the aim of contributing to the United Nations SDGs. The project idea in the TAMK is based on the United Nations Sustainable Development Goals in R&D activities. In the ideation phase, the link to the SDGs must be identified and expressed.

4.2 Collaboration and Community

The creation of a community around the topic of sustainability is supported in TAMK, KK and in UMA. In UMA in particular, the focus is on improving the spaces used by students. UMA also reports the use of projects to connect the university to the community and integrate learning.

- Project in Green: An innovative educational project that is about active and collaborative learning and focuses on incorporating green ecosystems into the architectural project.
- Málaga Biomimicry: A Meaningful learning and innovation modeled on nature.
- The Sustainable Development Goals: student knowledge and engagement through learning through sociology projects [16].

At TAMK, the "Forest Recipe" project has involved students in activities aimed at using the surrounding natural environment to promote physical and mental well-being. KK organizes events on sustainability topics for students, has a student science group for sustainable development, offers student-led



activities on sustainability and involves students in research activities on sustainability. International collaboration in course design enhances students' ability to cooperate and helps to understand local characteristics of sustainable design or business. TAMK and KK participate in international student competitions related to sustainability.

4.3 Content and Skills

In all participating universities, there are study contents that relate to sustainable development. The integration of competences and the extent to which conscious decisions are made about the choice of pedagogical approaches that support the development of students' green competences varies between the participating universities. At TAMK and UMA, there are strong efforts to describe the competencies that students learn rather than focusing on content. The TAMK offers teachers help in planning the integration of sustainability into their courses. There is a special page on sustainable development in education on the Teaching and Learning Center website.

At TAMK, the Sprint Innovation Festival is a course in which multicultural teams solve problems around sustainability issues (for example: promoting social entrepreneurship, mental and physical well-being in the workplace and mainstreaming the circular economy), working closely with partners from the field. This encourages the development of problem-solving and collaboration skills. Higher education institutions also report on many projects that promote sustainability through their content.

4.4 Practical Course Design

Best practice in course design includes sharing materials and other faculty expertise on sustainability, using guest lecturers, and organizing business case competitions. The use of online lectures is mentioned as a way to reduce the environmental impact of the institutions.

5 Empowering Staff for ESD

5.1 Educators' Needs

The challenges in developing ESD can be divided into individual and systemic challenges. At an individual level, there is a need to both secure the knowledge base of teachers and to communicate to them the importance of pedagogy in promoting sustainability skills among students. Provide educators with



up-to-date information and deepen their understanding of sustainability concepts and issues and equip them with effective teaching strategies tailored to ESD (HAUP). Educators have limited awareness or understanding of the principles and practices of ESD. This lack of familiarity hinders their ability to effectively integrate sustainability into their teaching and curriculum development (KK). Training to foster community partnerships and engage students in service-learning projects that address local sustainability challenges (HAUP). Training on the use of technology tools and platforms for ESD enhance their ability to deliver engaging and interactive lessons, facilitate online discussions and incorporate multimedia resources into their teaching (HAUP).

Evaluating ESD courses (THWS) can indeed be challenging and controversial. One factor that can prevent teachers from taking action to promote sustainability is the atmosphere fostered by colleagues. Teachers often face resistance from colleagues or administrators who are skeptical about the value or relevance of ESD. In addition, some teachers are reluctant to adopt new teaching methods/content related to ESD, which requires persuasion (THWS).

Practical challenges related to these individual needs mainly revolve around resource constraints, which include limited time, opportunities for teacher training and access to teaching materials tailored to ESD. The lack of targeted training opportunities exacerbates the problem, which is compounded by insufficient financial or institutional support for professional development initiatives (CC). In addition, the provision of appropriate resources, such as teaching materials, can be costly (THWS).

Teachers often feel time constrained in developing their own skills and perceive a lack of knowledge about sustainable development and building a sustainable future (TAMK). This feeling is exacerbated by the constant time crunch caused by heavy workloads and competing demands on educators' time (KK).

5.2 Need for More Systemic Approaches

The practical needs raise the issue to the systemic level of universities. How do we find time and resources to develop green skills at HEIs? There are organizational issues relating to what is valued in HEIs. Financial and structural support should be provided to HEIs in a holistic manner.

Systemic challenges include the need to embed the teaching of Education for Sustainable Development (ESD) content and skills in all academic staff (UMA). It is crucial to promote the understanding that pedagogical methods and solutions related to the development of sustainability skills are part of everyday teaching, as the importance of pedagogical approaches is not fully recognized (TAMK).

At the systemic level, there is also a need to overcome disciplinary boundaries, as ESD covers a wide range of issues - from environmental protection to social justice - and continuing education is complex (THWS). Some answers also point to solutions:



- Build systematic support for sustainability skills development and more structured organizational support (TAMK).
- Encourage interdisciplinary cooperation: Effective implementation of ESD often requires interdisciplinary cooperation between educators from different departments and disciplines (KK).
- Support teachers/educators in using different disciplines in their teaching, as ESD requires an interdisciplinary approach (THWS).
- Integrate internships, field studies and project work into training programs (THWS).

6 Student-related Challenges

The main student-related challenges concern the lack of knowledge about ESD or sustainability-related topics and their relevance to students' subjects, which leads to motivation problems and a lack of interest. Many students have limited awareness or understanding of sustainability concepts and their relevance to their studies and future careers. Without a basic understanding of sustainability, students find it difficult to recognize the importance of developing green skills or integrating sustainability principles into their lives (KK). Many students do not know what ESD means and there is insufficient engagement with climate change in the core curriculum, except in thematic subjects (THWS). In addition, there are challenges in terms of networking: either there are less networking opportunities (THWS) or students do not actively participate in the opportunities organized by the university (UMA).

The TAMK responses indicate that all students should have the same opportunities to strengthen their green skills, while acknowledging that this is not yet the case. The reasons for this include the fact that sustainability literacy, both as a content framework and as a pedagogical approach for teachers, has not yet become a permanent practice. The introduction of new perspectives still largely depends on the enthusiasm and interest of teachers (TAMK). Some responses suggest solutions to help students better understand the meaning of ESD and to promote networking and personal green competence.

- **Integration of different academic knowledge bases:** Students should be exposed to multidisciplinary perspectives and understand how different disciplines contribute to addressing sustainability challenges (HAUP).
- **Problem-solving skills and action-oriented perspectives:** Students have to recognize sustainability problems, propose innovative solutions, and implement meaningful actions to effect positive change. Integrating the transformative aspects of a strong sustainability vision is critical to understanding the need for social and economic change (HAUP)



- **Empowerment:** Students should be empowered to actively contribute to solving global challenges (THWS).

The results of the mapping are consistent with the background study of the EduSTA project and numerous other studies in terms of ESD competences. These needs relate both to individual teacher competences (knowledge and pedagogical skills) and to the systemic development of school structures. These expectations are closely related to the role of the teacher in transformative learning processes: Learning with students, enduring uncertainty [8] and the ability to act in an uncertain world [17].

7 Teacher-related Skill Development

The Personal Green Skills project focuses on the individual level, but at the systemic level, it is important to consider the needs for cooperation and empowerment of students, pointing to three main areas for teacher skills development:

1. Skills related to knowledge about sustainability. This refers not only to knowledge about sustainability, but more importantly to the ability to use this knowledge in curriculum development, lesson planning and interaction with colleagues and students. This is essentially the ability to relate sustainability to students' daily lives and careers, which also helps to motivate students. It also involves recognizing uncertainty and complexity in the context of sustainability: "Understanding sustainability science and the differentiation from conventional sciences" (HAUP).
2. Pedagogical skills to promote ESD. This includes the skills to design learning environments and processes that facilitate the development of Green Comps. Teachers need courage and confidence to learn with students. Teachers do not have to be experts themselves.
3. Skills to organize collaborative action for sustainability and to promote the development of student empowerment. For these skills, collaboration with stakeholders inside and outside HEIs is important.

Aspects of hope, action and connections play an important role in all skill areas. The proposal of specific training courses on the SDGs and opportunities to participate in them. This would mean that teachers would be more knowledgeable about the SDGs; allowing them to better reach students in the classroom and share their acquired knowledge of the SDGs. The TAMK team proposes that we apply the following principles when developing the Personal Green Skills in HEI methodology. We focus on personal and collaborative skills - not technical skills. We abandon the idea of developing



a five-point scale for skills development. Instead, we focus on valuing and recognizing the initiation of agency when setting competency goals and developing learning opportunities. In our project we focus on creating opportunities for collaborative learning processes related to transformative learning in sustainability development.

Pedagogically, this project could particularly emphasize the cultivation of hope, the activation of future thinking and the promotion of agency as part of a learning community. From the perspective of teachers' pedagogical competence, it would be significant if they could see the strengthening of students' sustainability and environmental competence as part of their daily work. This includes the competence of teachers to choose pedagogical methods that support the development of a learning community, strengthen students' awareness of values and empathy and activate future thinking. It is also about creating learning situations in which students experience their ability to influence and act together with others, to connect with the society and nature around them - in other words, to become active.

8 Implications for the Planned BIP

Within the framework of Work Package 2, we have developed this report which outlines best practices for promoting ESD at our partner universities. The insights derived from this status quo serve as the foundation for the development of a BIP in Work Package 4. The BIP aims to create a new elective, international, interdisciplinary course designed by trained lecturers (as per WP3) and integrated into the study processes and curricula of partner universities on the topic of "Scientific Basics of Climate Change". The primary objective of the course is to provide students with an understanding of the causes and complexities of anthropogenic climate change, with the underlying assumption that acquiring this knowledge will positively influence students' personal behaviors towards achieving the Sustainable Development Goals (SDGs). Consequently, the course will predominantly focus on key scientific concepts of climate change while adopting an interdisciplinary approach.

Therefore, BIP aims to empower students to promote their agency, participation and influence. Essentially, it is about improving students' ability to take sustainability-related actions together and thereby improve existing conditions or change practices. The course will integrate the Sustainable Development Goals (SDGs) as a basis for problem- or phenomenon-based learning. This approach will guide faculty toward a pedagogy that encourages student engagement and participation while cultivating the skills, competencies, and attitudes necessary for cultural renewal. Rather than just assessing skill levels, it would be more valuable to help students assess the development of their skills. TAMK could enrich the pre- and post-surveys in this regard.

From the teacher's perspective in the context of this project, this ability could be defined as the ca-



capacity to utilize community-based learning processes. It involves tailoring learning processes to their own context and identifying learning opportunities, while adeptly employing learning environments, teaching methods, and assessment strategies. These learning environments to be created should:

- Encourage students to utilize future learning to make informed decisions in the present.
- Strengthen students' abilities to imagine alternative futures and plan for change.
- Support transformative learning processes.
- Support students and help them express empathy.
- Support students in identifying, evaluating, and reflecting on their values.
- Support students in reflecting on and analyzing the impact of their actions in terms of sustainability.
- Create learning opportunities for students to take the initiative on sustainability in their educational context.
- Facilitate students' identification of sustainability challenges that they can address through collaborative action.
- Support students in achieving change towards sustainability through collective action.
- Maintain hope and consider emotions when anticipating and influencing change for ESD.

To summarize, from the teacher's perspective, these diverse skills play a central role in fostering students' agency, critical thinking and commitment to sustainability in their educational journey.

These newly created learning environments can support students in actively engaging with and reflecting on ESD in courses. The aim is to enable students to:

- Participate in community-led learning processes.
- Participate in a learning process that strengthens their ability to:
 - Use future knowledge to make informed decisions in the present,
 - Imagine alternative futures and envision change,
 - Demonstrate empathy,
 - Identify, evaluate, and reflect on their values,



- Reflect on and analyze the impact of their actions in terms of sustainability.
- Take part in sustainability initiatives in the educational context.
- Identify sustainability challenge(s) that they can address through collective action.
- Act collectively to achieve change towards sustainability.
- Strengthen optimism in the face of sustainability challenges by experiencing opportunities to take action and make a difference.

In this project, students see these opportunities as a way to actively engage in community-led learning, improve their ability to make proactive decisions, empathise and critically reflect on sustainability values. They also enable students to engage in sustainability initiatives in their educational environment, tackle sustainability challenges together, drive meaningful change and develop optimism in the midst of challenges through concrete action.

9 Conclusion

This report provides an insightful overview of the promotion of students' personal green skills in five HEIs and an examination of the policies and strategies influencing them. As the review could only be conducted to a limited extent due to limited time and resources, the findings are presented as preliminary. A key observation is that while some national implementation strategies outline competency targets for undergraduate programs, overall national strategies are loosely defined. Higher education staff face challenges such as resource constraints, especially in terms of time, an urgent need for a better understanding of sustainable development and pedagogical tools, and a demand for better opportunities for collaboration.

As the focus of the project is on enhancing the personal green skills of staff and students, the following steps will prioritize the development of actions that nurture hope, promote forward thinking and strengthen agency within the learning community. These skills will not only empower individuals to overcome challenges together, but will also enable more effective communication of needs to school leadership, driving collective progress towards sustainability goals.



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