TRANSFORMING TEACHING FOR A GREENER PLANET

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WORK PACKAGE 2. CONSOLIDATION OF KNOWLEDGE

Deliverable 1. Current State of the Integration of Green and Sustainability Competencies in VET

INTERNATIONAL REPORT

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Introduction

Sustainability is a pressing issue in the context of the ongoing climate crisis. Adopting sustainable practices and lifestyles that reduce environmental impact is essential for enhancing both planetary health and quality of life. Integrating sustainability into various domains, including society, work, and education, is imperative, with particular relevance to Vocational Education and Training (VET).

This document presents the results of comprehensive research conducted in Bulgaria, Italy, Romania, and Turkey in the framework of the Erasmus + project “Transforming Teaching for a Greener Planet” /GreenTeach/.

The primary objective of the project is to promote and facilitate green and sustainable education within vocational training institutions. This will be achieved by developing and enhancing VET educators' green skillsets and sustainability competencies in alignment with the European Sustainability Competence Framework, “GreenComp” (European Commission, 2022).

By achieving this goal, the project will strengthen VET institutions' capacity to respond effectively to the evolving demands of the labor market and society, particularly in the context of green and digital transformations. Additionally, it will contribute to addressing climate change and fostering environmental sustainability, ultimately supporting the transition to a greener future.

This report systematizes the information about the main elements and features of VET and analyzes the findings about the current situation and the implementation of the GreenComp framework within the VET sector across the four partner countries, as documented in national reports developed by partner organizations.

With a research focus on educational policies, initiatives, and activities aimed at enhancing sustainability competencies and green skills among VET educators, this study seeks to systematize existing expertise and achievements at the international level, identify key challenges, and highlight areas for improvement.

The insights gained from this analysis will serve as a foundation for subsequent stages of the project, which aim to consolidate knowledge and develop innovative, research-based approaches and tools to support the transformation of VET at national, international, and European levels.

Research Methods and Tools for Data Collection

The conducted research adopts a qualitative mixed-methods approach, integrating desk research and interviews with VET experts to examine how sustainability competencies and green practices are incorporated into the VET programs in Bulgaria.

The document analysis involves the revision of strategic documents, educational guidelines, policy documents, VET curricula, publications and reports about governmental initiatives aiming to promote the development of sustainability competencies and the incorporation of green practices in VET sector.

The results and findings derived from the documentary research were further enriched by valuable insights gathered from semi-structured interviews with 20 VET experts, providing their unique perspectives, extensive experience, and valuable insights on sustainability education and mainstreaming of green practices within VET programs.

The collection of best practice examples selected by the partners based on a clearly defined set of criteria is presented in the Appendix to the main body of this report. The identified best practice examples from Bulgaria, Italy, Romania and Turkey illustrate successful initiatives and innovative approaches for teacher training and capacity building to advance the implementation of sustainability and integration of green practices in VET.

The analysis and selection were made based on the following set of criteria:

- Originality and creativity in design and delivery using novel methods for sustainability education.
- Potential to ensure equitable access for diverse learners across socio-economic backgrounds, genders, ethnicities, and abilities.
- Measurable success in enhancing VET trainers' sustainability competencies, including knowledge, skills, and attitudes.
- Ability to adapt and replicate the practice across various VET contexts with consideration for institutional and cultural differences.
- Enhancing VET trainers' capacity to implement sustainability competencies that support broader societal and environmental objectives.
- Potential for wider adoption in other VET systems, focusing on cost-effectiveness and practicality.

Key Components and Characteristics of VET

The following section presents the main elements and features of VET systems established in the countries involved in the project consortium.

VET system in Bulgaria

VET in Bulgaria is structured within both upper secondary education and various forms of further vocational training. The legal framework governing VET distinguishes six types of initial and continuing VET (IVET and CVET) programs. These programs define the corresponding levels within the European Qualifications Framework (EQF) and the National Qualifications Framework (NQF), establish entry requirements and age criteria, and regulate the form, content, and duration of education and training. The State, through its relevant institutions, establishes the legal framework for the effective implementation, administration, and funding of VET at the national, regional, and local levels. The Bulgarian VET Act (VETA) defines two primary target groups: (1) school-age learners enrolled in formal education and training and (2) adults aged 16 and above who are not participating in formal education and training. A dual training system within secondary education and a dual training system for adults have been established. Dual education in Bulgaria is based on collaboration between an educational institution—such as a VET school or a VET training centre—and one or more employers. VET in Bulgaria is delivered at the secondary and post-secondary (non-tertiary) levels through State, municipal, and private vocational schools; Vocational gymnasiums; Art and sports schools; VET colleges, and licensed VET centres. These institutions operate under the national regulatory framework to ensure alignment with labor market needs and educational standards.

The National Agency for Vocational Education and Training (NAVET) functions as a specialized body, playing a key role in the development and oversight of VET qualifications. NAVET is responsible for establishing State Educational Standards (SES), which define the required competencies and structure curricula into learning outcomes for all VET qualifications at EQF levels 2 to 5. NAVET maintains the List of Professions to ensure alignment with labor market needs and monitors the activities of VET institutions.

VET system in Italy

Italian VET is characterised by a dual education model, combining classroom-based learning and hands-on training in collaboration with industries and businesses.
VET programs are available at secondary and post-secondary levels and cover various sectors, including renewable energy, agriculture, engineering, health, and more. This flexible system caters to diverse learners, including young people, adults, and workers seeking to improve their skills.
There is permeability across VET programmes and also within the general education system. On completion of a 3-year regional IVET path, it is possible to attend 1 additional year leading to an EQF level 4 vocational diploma; this allows enrolling in the fifth year of the State education system and sitting the State exam for an upper secondary technical or vocational education diploma (EQF level 4).

VET for adults is offered by a range of different public and private providers. It includes programmes leading to upper secondary VET qualifications to ensure progression opportunities (upskilling) for the low-skilled; these are provided by provincial centres for adult education (*centri provinciali per l'istruzione degli adulti,* CPIA) under the remit of the education ministry.

VET system in Romania

Initial VET is provided at upper-secondary and post-secondary levels. Initial VET is under the responsibility of the Ministry of Education. National Centre for TVET Development coordinates the development of training standards for qualifications, validated by sectoral committees (coordinated by the National Qualifications Authority, NQA). Social partners participate in the committees and support VET implementation. Continuing VET is under the responsibility of the Ministry of Labour and Social Solidarity. Post-secondary VET provides 1- to 3-year higher VET programmes (ISCED-P 453) organised by technological schools or colleges/universities and leading to a professional qualification at EQF level 5. Adult vocational training is offered by authorised private and public providers. 1- to 3-year continuing 'apprenticeship at workplace' programmes are managed by the public employment service. They offer adults (16+) without prior VET experience the chance to acquire a professional qualification at EQF levels 1 to 4, leading to a nationally recognised qualification certificate of the same value as in initial VET. Theory and practical training (WBL at least 70%) are provided mainly by companies, in cooperation with authorised professional training providers.The Romanian VET system is governed by a set of national laws and regulations designed to align education with labour market needs and sustainability goals. Key legal frameworks include:

- Law No. 1/2011 on National Education: Establishes the structure of the Romanian education system, including provisions for VET, professional qualifications, and lifelong learning.
- Government Ordinance No. 49/2019 on Dual Education: This ordinance defines the structure and functioning of dual education, which combines theoretical learning with workplace-based training.
- Ministerial Order No. 3554/2017: Regulates professional competencies and curriculum frameworks for VET institutions.
- Law No. 307/2023 on the Promotion of Green Competencies in Education: Encourages the integration of sustainability and environmental protection topics into national curricula.

To ensure the quality and relevance of VET, Romania has developed several standards and guidelines:

- NQF: Overseen by the Romanian Qualifications Authority (ANC), this framework aligns professional qualifications with the EQF.
- Curricular Guidelines for Technical and Vocational Education (CNDIPT): Developed by the National Centre for Technical and VET Development, these guidelines incorporate green and sustainability competencies.

- Sectoral Committees for VET: These committees, involving representatives from industry, education, and government, help design curricula to match labour market needs, including sustainability skills.
- National Occupational Standards: Define job-specific competencies and training requirements, with increasing emphasis on green skills in sectors such as agriculture, energy, and construction.

VET system in Turkey

Compulsory education in Turkey is organized for 12 years without interruption, including primary and secondary education. Vocational education takes place at the secondary level in the last four years of this field. Vocational and technical education in Turkey is provided in public and private secondary education institutions within the scope of formal education and vocational schools, colleges, faculties and institutes within universities at the higher education level.

In public and private vocational and technical secondary education institutions, vocational education is generally carried out in three different types of programs. These; Anatolian vocational program as school-based vocational education and Anatolian Technical program is a workplace-based vocational training center program.

Four-year education is provided in vocational education institutions implementing Anatolian Technical Program and Anatolian Vocational Program. During the education period, students take theoretical and applied vocational courses as well as academic courses at school. In these programs, students receive general education in the 9th grade and continue their branch education from the 10th grade. Students do an internship for 40 working days in enterprises to improve their skills in their professional fields.

In the vocational and technical education system in Turkiye, the problems expressed by all stakeholders have been determined under themes, taking into account the top policy documents. Problems in this direction can be listed as below;

- Problems related to access to vocational and technical education and awareness,
- Problems related to educational environments,
- Problems related to curricula,
- Problems related to vocational and technical education stakeholder cooperation,
- Problems with the trainer profile and source,
- Problems related to the transition of vocational and technical education graduates to employment.

Details of these problems are listed in detail in the Ministry of National Education Vocational and Technical Education Policy Document (2024).

Another significant challenge is the need to strengthen the link between education and industry to ensure that the skills taught in VET institutions align with evolving labor market demands. The disconnect between VET training and industry requirements exacerbates youth unemployment and underemployment, particularly in sectors undergoing rapid transformation, such as the green and digital economies.

The transition to a green economy requires substantial investment in new skills and technologies, positioning VET as a critical driver in preparing students for emerging industries. Ensuring that VET systems are responsive to these evolving demands is essential for developing a workforce equipped with the competencies necessary for sustainable economic growth.

VET Educators and Continuous Capacity Building

This section provides an overview of the categories of educators involved in the VET systems of the respective consortium countries, followed by a concise summary of the opportunities for their continuous professional development outlined in the national reports provided.

The Bulgarian VET system involves the following categories of educators:

- General subject teachers should have specialties in a professional field corresponding to the relevant school subject, with a professional qualification in teaching;
- Vocational subject teachers should have:
    - specialties in vocational fields corresponding to the professions on the List of professions for VET taught at the relevant school, and an additional professional qualification in teaching
    - specialties of a professional field corresponding to the professions taught at the relevant school (in case of specialists working in companies or prominent experts in the respective field invited to participate in vocational training at VET institutions to provide up-to-date specialized knowledge and improve the link with practice)
- Trainers who work in vocational centres should have a university diploma in a speciality corresponding to the professional field out of the List of professions for VET in which the profession to be taught has been classified;
- Mentors for training at enterprises should have specialties in a professional field corresponding to the professions taught at the relevant school.

According to Ordinance 15[1] issued by the Bulgarian Ministry of Education and Science (MES) in 2019 and updated in 2021, teachers are required to continuously improve their competencies. The Strategy for the Development of VET prioritizes the introduction of a system for updating and developing the qualification of VET teachers - continuous professional development (CPD).

[1] https://lex.bg/bg/laws/ldoc/2137195301

The relevant legislation sets the qualification requirements for each category described above. The participation of teachers in CDP training courses conducted by organisations from other Member States of the EU or a third country has been recognized as well.

In Italy, VET teachers and trainers come from various backgrounds, depending on their teaching sector. These include:

- Vocational Teachers: These educators typically hold qualifications in specific technical fields and teach theoretical and practical subjects related to their expertise, such as mechanics, ICT, or hospitality.
- Workplace Trainers: These trainers are professionals who work in the industries relevant to the VET programs and provide on-the-job training to students. They ensure that learners acquire practical, real-world experience and competencies.
- Academic Teachers: In some cases, VET institutions employ teachers with strong academic backgrounds who provide the theoretical knowledge necessary to understand the principles of vocational fields.
- Green and Sustainability Trainers: As the demand for green skills grows, many VET programs incorporate specific sustainability and environmental courses. Trainers in these fields are expected to be experts in renewable energy, waste management, sustainable agriculture, and other green technologies.

The Italian Ministry of Education, in collaboration with regional authorities, offers continuous training programs for VET teachers and trainers. These programs focus on updating educators' knowledge in emerging fields such as sustainability, renewable energy, and green technologies. According to the law, teachers' in-service training is compulsory and continuing, without any specifications about duration. Teachers' in-service training must be aligned with the school training supplies, the school improvement plan and the priorities of the education ministry; it must involve all open-ended contract teachers. Incentives are provided to support teachers' CPD and systematic need analysis mechanisms.

The Romanian VET system primarily involves:

- Subject-specific teachers: Educators specializing in vocational subjects such as agriculture, engineering, and healthcare.
- Practical trainers: Industry professionals providing hands-on training during workplace placements.
- Mentors and CPD facilitators: Experts involved in upskilling VET educators, particularly regarding sustainability education.

Several mechanisms have been established to ensure the continuous professional development of Romanian VET educators, focusing on green and sustainability competencies. National initiatives funded by the Romanian Ministry of Education promote green competencies through programs like eco-friendly teaching modules. Workshops and webinars are regularly organized to build teachers' capacity and introduce sustainability-focused teaching methods. Peer learning

networks also play a crucial role by providing platforms where Romanian VET educators can share best practices, collaborate, and enhance their professional skills collectively.

Vocational education and training (VET) in Turkey is provided by public and private secondary education institutions that offer formal education and vocational schools and faculties within universities at the higher education level. Formal VET institutions at the secondary education level are Vocational and Technical Anatolian High School, Multi-Program Anatolian High School, Vocational Training Center (VTC), Vocational Distance Education High School and Special Education Vocational High School for disabled people, Special Education Vocational School and Special Education Practice School.
VET in the form of non-formal education is offered through various vocational and technical courses organized by various public and private organizations under the supervision of the Ministry of National Education (MoNE) and in public education centres where people who aim to develop their vocational knowledge and skills and acquire new skills they need in the business world for lifelong learning purposes.

The CPD of VET educators in partner countries is organized and delivered in various forms and formats. The most popular initiatives and broadly used solutions are systematized in the table below:

CPD opportunity	Description
Training Programs and Workshops	Aim at updating VET educators' knowledge, especially in emerging fields
In-service Training[2]	VET institutions organise in-service training to integrate the latest sustainability competencies into their curricula
National initiatives\projects	Funded at the national level and focused on establishing infrastructures, professional development of educators, designing and creating tools with a focus on green and sustainable competencies
Industry Collaboration and Sectoral Networks	VET institutions collaborate with industry partners to provide teachers with insights into the latest industry trends, including green practices.

[2] According to the data from a national survey, published in 2022[2], VET teachers in Bulgaria attended mostly short-term qualification activities (up to 60 hours), while participation in long-term pieces of training (more than 60 hours) has been relatively limited https://www.cedefop.europa.eu/en/country-reports/teachers-and-trainers-changing-world-bulgaria

Collaboration Platforms and Research and Innovation Networks	VET educators take part in research and innovation networks, which focus on developing sustainable practices in education and training
European Programs and Funding	Through participation in EU programs like Erasmus+, VET teachers and trainers can access professional development opportunities abroad, and engage in international partnerships

Table 1 Initiatives and solutions for the provision of Continuous Professional Development (CPD) opportunities for VET educators

Integrating Green and Sustainability Competencies in VET Curricula

International Initiatives

On 30 November 2020, ministers responsible for vocational education and training (VET) from EU Member States, Candidate Countries, EEA-EFTA nations, European social partners, and the European Commission endorsed the *Osnabrück Declaration 2020*[3]. This declaration recognizes VET as a key driver of recovery and just transitions to digital and green economies, prompting the establishment of various initiatives and support frameworks.

VET is a priority under the European Education Area (2021-2030), fostering cooperation through dedicated working groups. These include the *Working Group*[4] *on VET and the Green Transition* and a sub-group on *Education for Environmental Sustainability*, which facilitate knowledge sharing and best practices among Member States.

The European Social Fund Plus (ESF+)[5], with a budget of €99.3 billion (2021-2027), prioritizes VET and adult education in the green and digital transition. It supports skills development, equal access to quality education, and addressing skills mismatches—focusing on those most in need.

Erasmus+ Programme[6] strengthens education, training, youth, and sport across Europe, aligning with the European Education Area, Digital Education Action Plan, and European Skills Agenda. It funds 100 *Centres of Vocational Excellence*, numerous *Alliances for Innovation*, and *Capacity Building* projects in VET with third countries (European Commission, 2023). Additionally, it supports over 600 annual cooperation partnerships managed by National Agencies.

[3] https://www.cedefop.europa.eu/files/osnabrueck_declaration_eu2020.pdf
[4] https://education.ec.europa.eu/about-eea/working-groups?
[5] https://ec.europa.eu/european-social-fund-plus/en
[6] https://op.europa.eu/en/publication-detail/-/publication/4f38e3b2-39b7-11ed-9c68-01aa75ed71a1/language-en

In addition, environmental protection, sustainable development and climate action are priorities for the European Solidarity Corps[7].

In all national research reports provided, the partners underline the crucial role of the opportunity for participation in European initiatives, such as Erasmus+, which supports the exchange of best practices and the adoption of innovative sustainability solutions in VET curricula.

National policies, guidelines and initiatives in Bulgaria

Since 2020, dual VET in Bulgaria has been implemented in vocational schools, primarily through the European Social Fund project titled "Support for the Dual Training System". In 2020, the Council of Ministers adopted Decision No. 285 on April 30, which facilitated the choice between specialized or vocational education based on the needs of the labor market, the interests of learners, and the capacities of schools.

Funding of BGN 86.7 million (EUR 44.3 million) under the programme Education 2021-27, was allocated to enhance the dual VET system, supporting additional vocational training, teacher and mentor training, internships, and adult literacy.

In 2023 started project "Modernization of Vocational Education and Training"[8] which is implemented within the framework of the Education Program 2021 - 2027, co-financed by the EU with a specific beneficiary MES. This project covers all state, municipal and private schools in the country that provide VET and have submitted applications for participation. The main goal of the project is to offer modern and high-quality VET, meeting the rapidly changing needs of the labor market with a special focus on "… qualification of teachers in vocational training through specialized training related to the transition to a digital and green economy …".

From 2023 to 2026, the National Recovery and Resilience Plan includes a program called "School STEM Environment." This initiative aims to enhance the physical environment and provide the technical equipment and furnishings needed for STEM spaces in schools. The goal is to create an integrated learning environment that fosters educational innovation in STEM subjects, encourages students' interest in science, and promotes research.

In March 2024, the VET Act was amended. One of the most significant changes involves updating the List of Professions for VET and the introduction of broad-profile professions through the consolidation of qualifications. The concept of "part of the profession" is established in regulatory terms. The educational standards also introduce general professional competencies related to environmental protection, as well as specific competencies in the use of information technology.

[7] https://youth.europa.eu/solidarity_en
[8] https://sf.mon.bg/?go=page&pageId=576

Additionally, opportunities for vocational training for individuals over 16 years of age are being expanded by implementing regulations for distance learning in an electronic environment.

National policies, guidelines and initiatives in Italy

Several government frameworks in Italy actively promote the development of sustainability competencies within VET. The Italian Green New Deal, introduced in 2020, is a key framework that underscores the role of education in Italy's green transition. This initiative emphasises the need for training in green technologies, energy efficiency, renewable energy, and sustainable agriculture, aligning VET institutions with Italy's environmental and economic goals (European Commission, 2022). The National Recovery and Resilience Plan (PNRR), a post-pandemic strategy launched in 2021, similarly advocates for green innovation and sustainable development. The PNRR prioritises education and vocational training in emerging green sectors, preparing the workforce for roles in renewable energy, environmental conservation, and sustainable construction (OECD, 2023).

Italy's participation in European Union programs like Erasmus+ and the European Social Fund (ESF) also facilitates the development of sustainability competencies in VET (European Commission, 2023). These programs enable collaboration between Italian VET schools and other European institutions, fostering the exchange of best practices and innovative sustainability solutions. For instance, the VET Schools Doing Green project unites vocational schools across Europe to promote sustainability awareness and action. By engaging in these international initiatives, Italian VET institutions can adapt their programs to align with global sustainability trends (UNESCO, 2023).

Italian educational guidelines have been instrumental in supporting the integration of sustainability competencies into VET curricula. The National Plan for Education for Sustainability emphasises the integration of sustainability across all educational levels, including VET. The guidelines encourage the inclusion of sustainability themes in subjects such as civics, technology, and vocational training, ensuring that VET students acquire essential competencies in renewable energy, waste management, and green technologies (European Commission, 2021). This plan also promotes adopting sustainable practices within VET institutions, encouraging schools to reduce their ecological footprint and operate sustainably (OECD, 2022).

In line with this, the Environmental Education and Green Skills framework developed by the Italian Ministry of Education focuses on enhancing green skills within VET programs. It highlights the importance of integrating environmental awareness into technical training, particularly in energy, agriculture, and tourism sectors (UNESCO, 2021). Curriculum reforms have been introduced to align VET qualifications with the growing demand for green skills, ensuring that courses in fields such as renewable energy, sustainable agriculture, and green construction technologies are developed or updated to meet the needs of the green economy (EFVET, 2023).

Through these reforms, Italian VET institutions are better equipped to train students for careers in the green sector, ensuring they acquire relevant skills to thrive in sustainable industries. The guidelines also encourage practical, hands-on learning experiences, such as workshops and school projects, which provide students with opportunities to apply sustainability knowledge in real-world scenarios.

National policies, guidelines and initiatives in Romania

In Romania, the implementation of GreenComp competencies in the Vocational Education and Training system is carried out through various national policies and practices.

Curriculum Integration: The methodological benchmarks for professional and technical education (IPT, 2024-2025) for 2024-2025, published by the National Centre for Education Policy and Evaluation, include guidelines for integrating sustainability competencies into training programs.

Micro-certifications: The public policy proposal on micro-certifications, developed by UEFISCDI, highlights the importance of aligning micro-certifications with European reference frameworks, including GreenComp, to ensure the recognition of sustainability skills.

Erasmus+ Funding: The Erasmus+ 2021-2027 program emphasizes sustainability and the green transition in education and training, offering funding opportunities for projects that promote These initiatives reflect Romania's commitment to promoting sustainability competencies in the VET system, which is in line with the European standards established by GreenComp.

In Romania, the promotion of sustainability competencies and the integration of green practices within the Vocational Education and Training (VET) system are supported through various governmental policies and initiatives:

The National Strategy on Environmental Education and Climate Change: This strategy[9] emphasizes the importance of environmental education and climate change awareness and proposes measures for integrating these topics into the national curriculum.
The Public Policy Proposal on Micro-Credentials: Developed by UEFISCDI, this proposal[10] highlights the need to align micro-credentials with European frameworks, including GreenComp, to ensure the recognition of sustainability competencies.

[9] https://www.edu.ro/sites/default/files/SNEM.pdf?utm
[10] https://uefiscdi.gov.ro/resource-866879-s4_propunere-pol-publice-micro-certificari.pdf?utm

The National Program for European Union Accession: This program[11] includes objectives related to sustainable development and implementing green policies, indirectly influencing the VET system by promoting sustainable practices.

Educational Projects and International Partnerships: Romania participates in various projects and partnerships promoting ecological education and sustainable development, enhancing green competencies within VET.

National policies, guidelines and initiatives in Turkey

There are various national policies and practices for the development of sustainability competencies in the Vocational Education and Training system in Turkey. These policies and practices, in line with the GreenComp framework, support the integration of sustainability competencies into the VET curriculum:

- Vocational and Technical Education Policy Document: This document, prepared by the Ministry of National Education, aims to strengthen vocational and technical education, to create a flexible system that can meet sectoral needs and to train a qualified workforce. The document also includes strategies for increasing sustainability and environmental awareness.
- Climate Change Action Plan: The Ministry of National Education aims to review and update the curriculum from a sustainable development perspective, to develop teaching materials suitable for the updated programs and to raise social awareness.
- Environmental Education and Climate Change Course: The Ministry of National Education aims to raise awareness of climate change by updating the "Environmental Education" course to "Environmental Education and Climate Change".

Below are listed some Government Policies and Initiatives.

- 1000 Eco-Friendly Schools Project: Within the scope of this project, it is aimed to equip schools with environmentally friendly practices and to raise awareness of students about sustainability.
- Zero Waste and Ecological Schools Projects: With these projects, it is aimed to increase waste management and ecological awareness in schools.

The Ministry of National Education updates its curricula with a sustainable development perspective to support the integration of sustainability competencies into the VET curriculum. In this context, climate change and environmental awareness issues are included in the course contents and training programs are organized for teachers.

[11] https://gov.ro/fisiere/programe_fisiere/pnar-vol2.pdf?utm

Sustainability competencies and green practices are increasingly integrated into the VET curriculum. In particular, by updating the curriculum and adding new courses, students are provided with knowledge and skills on sustainability issues.

Summary

The analysis of the collected data and research findings underscores that enhancing sustainability competencies and addressing the green skills gap are high-priority objectives within the VET systems of all participating countries.

Furthermore, strategic policy documents and educational standards reinforce the promotion of sustainability awareness and the integration of sustainability competencies into VET curricula, reflecting a strong political and sectoral commitment.

All countries have started various national initiatives to support vocational education reforms, taking into consideration the main national priorities, in accordance with the Council of the European Union Recommendation of 24 November 2020 (Council of EU, 2020) on vocational education and training and the Osnabruck Declaration (Osnabruck Declaration, 2020).

Despite these efforts, sustainability competencies are not yet fully embedded in VET systems due to persistent challenges that hinder their effective implementation. A primary obstacle shared across all participating countries concerns the modernization of VET curricula, particularly concerning sustainability and the green economy. To facilitate the seamless integration of green practices and sustainability into Vocational Education and Training is facing both progress and significant challenges. Although awareness of the significance of sustainability and green skills is increasing, the existing approaches to sustainability education in VET exhibit inconsistencies and gaps, particularly in their practical implementation. Despite widespread acknowledgement of sustainability's importance, various structural, economic, and cultural barriers impede its effective integration. Key challenges include limited funding, rigid curricular frameworks, and institutional resistance, all of which constrain the adoption of comprehensive sustainability practices within VET systems.

A more cohesive and systemic approach to sustainability education in vocational education and training (VET) is required, incorporating standardized curricula, hands-on training, long-term projects, and enhanced industry collaboration. To bridge the gap between theoretical knowledge and practical application, financial investment, technological and infrastructural support, and strategic partnerships with local communities are essential.

Furthermore, fostering collaboration among educational institutions, industries, and communities is crucial to ensuring that VET programs align with the evolving demands of green jobs and sustainability objectives. Structured support at both institutional and individual levels is urgently needed to facilitate the effective integration of sustainability competencies within VET curricula. Strengthening these foundations would enhance economic resilience, improve

employment opportunities, promote environmental responsibility, and contribute to both national and global sustainability efforts.

By addressing these challenges and promoting more flexible, well-resourced educational environments, VET can play a pivotal role in equipping future generations with the green skills necessary for a sustainable future.

Practical Perspectives

The interviewed expert group consists of 20 individuals (35% from Bulgaria, 35% from Italy, 15% from Romania and 15 % from Turkey) representing a diverse range of VET-related organizations, including VET departments at national, regional, and local authorities, VET training centers, schools and gymnasiums, VET colleges, as well as foundations and environmental organizations offering vocational education courses.

The interviewed experts offered unique perspectives and valuable insights on sustainability education and the integration of green practices within VET programs. Their contributions reflect extensive experience across various fields, including environmental education (covering substantial, methodological, and pedagogical aspects), waste reduction practices, ecological innovation, green business models, environmental impact assessments, renewable energy solutions, circular economy strategies, climate change adaptation, sustainable resource management, and policy development.

A structured set of predetermined key questions, collaboratively developed by the partnership, served as the interview guide to systematically collect insights from VET experts drawn by their extensive expertise and practical experience in the vocational education domain.

This approach ensured a uniform and consistent gathering of information regarding their perspectives, positions, and reflections on critical issues identified by the consortium as essential for the effective and efficient integration of sustainability competencies and green practices into VET curricula.

All interviewed experts provided informed consent by signing the Declaration of Informed Consent, affirming their voluntary participation in the GreenTeach project's research phase. They also acknowledged that their personal data would be used solely for research purposes and not disclosed to third parties.

The following sections provide a thematic summary of the interviews conducted in Bulgaria, Italy, Romania, and Turkey.

Effectiveness and Impact of Current Practices

Experts assessed the effectiveness of sustainability education in VET, highlighting both progress and persistent challenges. While international initiatives, industry collaborations, and policy-driven investments support green skills development, inconsistencies in implementation, curricular integration, and practical application remain key obstacles.

Country-Specific Analysis

Bulgaria:

- Green skills development in VET is in its early stages. There is a lack of systematic implementation.
- International projects, particularly Erasmus+ projects, play a crucial role in advancing sustainability education.
- Work-based training (WBT) and awareness initiatives are essential but insufficient.
- Courses fail to align with European and international sustainability standards, affecting students and educators.
- Experts suggest prioritizing teacher training before developing structured programs for students.

Italy:

- Lack of Practical Application: Many programs emphasize theory over hands-on training.
- Curricular Gaps: Sustainability education lacks integration and depth, particularly in areas like waste management.
- Policy and Funding Influence: Investments under the Green Transition and Agenda 2030 initiatives support education, but long-term impact remains uncertain.
- Emerging Sustainability Roles: New professions, such as Green Coordinators, highlight progress, yet VET curricula remain insufficiently structured.
- Youth Engagement: While students are interested in sustainability, educational programs do not effectively translate awareness into practical skills.
- Systemic Reform Needs: A dedicated, interdisciplinary sustainability curriculum is required for comprehensive competency development.
- Role of Environmental Organizations: Groups like Lega Ambiente contribute to teacher training and curriculum enhancement, but broader institutional support is needed.

Romania:

- Effectiveness Indicators: Evaluations focus on employability in green sectors, learning outcome assessments, and practical sustainability initiatives in schools.
- Stakeholder Feedback: Surveys and interviews with students, teachers, and employers assess alignment with job market needs.
- Community Impact: Student-led projects, such as beehive design and wood waste recycling, demonstrate practical application.

- International Benchmarking: Programs compare curricula against frameworks like the EU Green Deal and UNESCO's sustainability education standards.
- Continuous Monitoring: Institutions collect and analyze data to refine training programs.

Turkey:

- While significant progress has been made, efforts remain limited in scope and continuity.
- Expansion and strengthening of sustainability education initiatives are necessary to ensure long-term effectiveness.

Conclusion

Despite progress in sustainability education within VET, challenges persist in practical implementation, curriculum integration, and institutional commitment. Greater emphasis on structured teacher training, interdisciplinary curricula, industry collaboration, and long-term policy support is essential to developing effective green skills.

Strengths and Positive Aspects of the Existing Approaches

Experts highlighted key strengths in existing approaches to sustainability education in Vocational Education and Training (VET), emphasizing practical application, interdisciplinarity, business partnerships, and international collaborations. Despite challenges, several initiatives effectively integrate green competencies into education systems.

Country-Specific Analysis

Bulgaria:

- Practical Orientation: Students gain hands-on experience in real work environments.
- Interdisciplinarity: Programs like Mechatronics integrate mechanics, electronics, and IT while incorporating green competencies.
- Project-Based Learning: Digital simulations and sustainability projects enhance critical thinking and innovation.
- Business Partnerships: Collaborations with industries provide access to modern technologies and real-world case studies.
- Targeted Training Initiatives: Erasmus+ projects (e.g., SCOPE, B-Green-ED) promote sustainability management standards, though implementation remains inconsistent.

Italy:

- Growing Awareness and Prioritization: Sustainability is increasingly emphasized in education and policy due to initiatives like Fridays for Future and environmental regulations.
- Practical Experiences and Projects: Schools engage in applied activities, such as food waste surveys and water quality monitoring, linking theory to practice.
- Workforce Integration: Collaboration between schools, businesses, and professionals strengthens real-world skill development and green job awareness.

- Educator Commitment: Despite structural limitations, dedicated teachers integrate sustainability into curricula.
- Interdisciplinary Approach: Sustainability is embedded across subjects like geography and economics, though a fully structured curriculum is still lacking.
- Innovation and Green Transition Focus: Interest in fields such as renewable energy and sustainable construction fosters advanced technical training.
- Role of Civil Society: Organizations like Legambiente contribute to climate education and combat misinformation.
- Sustainability as a Cross-Cutting Theme: A systemic approach integrates environmental, economic, and social dimensions throughout education.

Romania:

- Curricular Integration: Some institutions (e.g., in Germany and Austria) embed sustainability into courses covering resource efficiency and waste management.
- Industry Collaboration: Countries like Latvia ensure practical and market-relevant sustainability training through partnerships with green industries.
- Hands-On Learning: Austrian institutions engage students in ecological projects, such as honey production and biomass recycling.
- Support from National and European Initiatives: Programs like Erasmus+ and the European Social Fund enhance sustainability education.
- Modern Teaching Methods: Digital tools, online simulations, and project-based learning improve engagement and effectiveness.

Turkey:

- International Collaborations: Erasmus+ projects facilitate sustainability education development.
- Campus Sustainability Initiatives: New school campuses adopt zero-waste and green energy projects.
- Increasing Awareness: A growing focus on green skills development across educational institutions.
- Hands-On Education and Technical Innovations: Practical and technology-driven approaches enhance sustainability learning.

Conclusion

Despite variations in implementation, key strengths in sustainability education across VET systems include hands-on training, interdisciplinary approaches, industry collaborations, policy support, and international partnerships. Expanding these strengths systematically could enhance sustainability competency development globally.

Difficulties and limitations

VET experts identified several critical obstacles to the effective integration of sustainability competencies and green practices into vocational education curricula. These challenges span structural, educational, financial, and cultural domains, limiting the development of comprehensive sustainability training in VET systems.

Country-Specific Analysis

Bulgaria:

- Insufficient Teacher Training: Many educators lack the necessary expertise, requiring additional training.
- Resource Constraints: Limited access to modern technologies hinders practical sustainability education.
- Conceptual Barriers: Stakeholders often misunderstand sustainability concepts and resist unfamiliar approaches.
- Lack of Standardized Curricula: The absence of unified guidelines complicates green skills implementation.
- Overcrowded Curricula: Difficulty in incorporating new topics without displacing existing subjects.
- Absence of National Standards: No formal framework exists for integrating sustainability into curricula.

Italy:

- Low Awareness and Practical Application: Students lack understanding of sustainability, and its education remains largely theoretical.
- Training-Employment Mismatch: Emerging green job profiles face uncertain market absorption due to low wages and cultural reluctance.
- Sectoral Disparities: Some industries embrace sustainability, while others resist or lack expertise, creating inconsistencies.
- No Unified Curriculum: Schools must independently implement ecological transition frameworks, leading to fragmented approaches.
- Short-Term Focus: Sustainability initiatives are often project-based rather than long-term institutional strategies.
- Complexity of Sustainability Topics: Integrating economic, technical, and social aspects remains a challenge.
- Regulatory Compliance Over Cultural Change: Sustainability practices are often enforced by law rather than adopted as core values.
- Limited Systemic Collaboration: Financial and logistical barriers hinder coordination between schools, industries, and governments.
- Fragmented Implementation: Sustainability principles, such as circular economy and green technologies, lack a cohesive framework.

Romania:

- Lack of a Standardized Curriculum: No universal framework exists across European VET systems.
- Inadequate Teacher Training: Many educators lack the resources and expertise to teach green skills.
- Insufficient Infrastructure: Many institutions lack renewable energy simulators and waste recycling facilities.
- Industry Resistance: Traditional businesses are reluctant to adapt training programs for sustainability.
- Labour Market Mismatch: Employer expectations often do not align with sustainability competencies taught in VET.

Turkey:

- Socioeconomic Challenges: Financial and regulatory constraints limit access to green education.
- Teacher Training Deficiencies: A lack of sustainability training for educators hinders curriculum development.
- Curriculum Limitations: The integration of sustainability remains inconsistent and underdeveloped.

Conclusion

Despite increasing awareness of sustainability in VET, major challenges persist, including inadequate teacher training, lack of standardized curricula, resource shortages, and industry resistance. Addressing these issues requires systemic collaboration, long-term strategies, and structural reforms to align VET education with the demands of the green transition.

Challenges

Experts identified significant challenges in integrating sustainability competencies and green skills into VET programs. These challenges encompass curricular, institutional, financial, and practical barriers, limiting the effectiveness of sustainability education.

Country-Specific Challenges

Bulgaria:

- Curriculum Adaptation Issues: comprehensive curriculum updates should be done to incorporate sustainability competencies effectively while addressing subject-specific integration difficulties.
- Resistance to Change: Teachers and students often perceive green skills as secondary rather than essential.
- Limited Resources: Time and financial constraints hinder additional teacher training and require long-term investments.

- Mismatch with Labor Market Needs: Insufficient alignment between educational content and real-world industry requirements, necessitating stronger VET-business partnerships.

Italy:

- Practical and Institutional Barriers: Sustainability efforts are deprioritized due to financial and operational constraints, particularly in cultural and artistic sectors. Standardized sustainability training, akin to safety training, is needed.
- Financial\Mobility Challenges: Limited funding restricts international exchange opportunities, but short-term programs and virtual collaborations could provide alternative solutions.
- Curricular\Organisational Rigidities: Bureaucratic constraints make it difficult to integrate sustainability across disciplines, requiring curriculum reforms and interdisciplinary teaching approaches.
- Lack of Flexibility in Educational Practices: Rigid structures prevent fieldwork and outdoor activities, which are essential for experiential learning in sustainability.
- Bridging Theory and Practice: While sustainability topics are covered theoretically, practical application remains weak due to limited long-term projects and institutional support.
- Programmatic Inflexibility: Centralized mandates restrict adaptability in VET curricula, though autonomous institutions like Higher Technical Institutes show greater flexibility in integrating sustainability topics.

Romania:

- Need for Continuous Curriculum Updates: Rapid advancements in green technologies and policies necessitate frequent revisions of educational materials.
- Theoretical Overemphasis: Many programs lack sufficient hands-on learning opportunities.
- Economic Barriers: Schools struggle to secure funding for sustainable infrastructure and training resources.
- Disparities in Access: Rural areas face significant gaps in sustainability education.
- Weak Industry Partnerships: Limited collaboration with businesses reduces opportunities for internships and practical training.

Turkey:

- Systemic and Structural Barriers: Challenges include bureaucratic constraints, lack of institutional commitment, and insufficient funding.
- Practical Limitations in Education: Limited infrastructure and financial resources restrict the effective implementation of green skills training.

Conclusion

The successful integration of sustainability competencies in VET programs requires systemic reforms, stronger industry collaboration, curriculum flexibility, and increased financial and

institutional support. Overcoming these challenges is essential to bridging the gap between sustainability education and labour market demands.

Opportunities and Benefits

Experts emphasize the numerous opportunities and benefits of strengthening sustainability competencies and green skills in Vocational Education and Training (VET). These advantages span economic, environmental, educational, and workforce development aspects, contributing to global sustainability goals and national economic growth.

Country-Specific Opportunities and Benefits

Bulgaria:

- Workforce Preparedness for Green Transition: Equipping employees and managers to drive sustainable economic transformation.
- Enhanced Organizational Sustainability: Strengthening sustainability strategies and practices within institutions.
- Alignment with Global Goals: Supporting the implementation of the UN Sustainable Development Goals (SDGs).
- Increased Competitiveness: Boosting students' employability and adapting to labour market shifts.
- Future-Proofing Skills: Ensuring learners acquire skills essential for a sustainability-driven economy.
- Job Creation: Expanding employment in renewable energy and sustainable technology sectors.
- Development of a Skilled Green Workforce: Providing businesses with sustainability-trained professionals.
- Reduced Environmental Impact: Lowering carbon emissions through green technology adoption.

Italy:

- Environmental Impact Reduction: Encouraging sustainable lifestyles to lower CO_2 emissions and mitigate climate change effects such as extreme weather events.
- Professional and Economic Growth: Improving career prospects and fostering economic expansion through sustainability-focused industries.
- Community and Regional Development: Strengthening local economies by fostering environmentally responsible practices.
- Education and Stakeholder Collaboration: Enhancing cooperation between students, educators, businesses, and institutions to integrate sustainability into regional policies.
- International Competitiveness: Positioning Italy as a leader in sustainable industries such as the circular economy, renewable energy, and organic agriculture.
- Job Creation in Green Sectors: Expanding employment in renewable energy, recycling, and environmental engineering.

- Cultural and Generational Shift: Encouraging widespread behavioral changes toward environmental responsibility across generations.

Romania:

- Higher Employability: Addressing the growing demand for professionals in green industries such as renewable energy and sustainable agriculture.
- Alignment with EU Sustainability Policies: Enhancing workforce adaptability to initiatives like the European Green Deal.
- Innovation Promotion: Encouraging creative sustainability solutions, such as wood waste recycling and eco-friendly production methods.
- Economic Growth: Attracting financial support from governments and EU bodies for sustainability-focused education.
- Environmental Awareness: Integrating sustainability into VET to drive a broader cultural shift toward eco-conscious behavior.

Turkey:

- Emerging Job Sectors: Growth of new green industries and employment opportunities.
- Global Competitive Advantage: Strengthening Turkey's position in international sustainable development efforts.
- Increased Societal Awareness: Encouraging individuals and communities to adopt sustainable practices.

Conclusion

Enhancing sustainability competencies in VET not only prepares students for the evolving job market but also fosters economic resilience, environmental stewardship, and social transformation. By integrating sustainability into education and workforce training, countries can drive long-term growth while advancing global sustainability goals.

Required Resources, Support and Infrastructure

This part summarizes the opinions of the interviewed VET experts regarding what resources, support systems, and infrastructure are required to improve the integration of sustainability competencies and green skills in vocational education across four countries: Bulgaria, Italy, Romania, and Turkey.

Country-Specific Opportunities and Benefits

Bulgaria:

- To improve sustainability education in VET, Bulgaria requires:
- Investment in modern equipment and technologies to facilitate hands-on learning.
- Specialized teacher training to ensure educators can effectively teach green technologies.
- Industry partnerships and mentorships to align curricula with real-world industry needs.

- Laboratories and simulation centers for practical training in green technologies.
- Comprehensive educational materials developed through collaboration with academia, research institutions, and industry stakeholders to standardize sustainability education.

Italy:

- Key factors identified for integrating green skills into VET include:
- Financial support and investment from national, regional, and local governments, particularly through initiatives such as the PNRR, to develop green and digital skills.
- Infrastructure and technological tools, including modern laboratories, digital learning platforms, and collaborative tools (e.g., podcasts, webcasts, and digital mapping systems) to enhance learning.
- Support from the Ministry and local administrations to fund green energy projects and promote sustainable transportation solutions (e.g., electric buses, bicycles).
- Connectivity and access to knowledge, ensuring students have high-speed internet, access to scientific publications, and opportunities to engage in sustainability-focused events.
- University collaboration to keep curricula aligned with the latest research and provide specialized training for educators.
- Practical and applied learning through fieldwork, citizen science, and experiential education to enhance student engagement with sustainability issues.

Romania:

- Government policies and funding, with an emphasis on implementing Romania's 2023-2030 National Strategy for Environmental Education and Climate Change.
- Investment in green technologies, such as renewable energy simulators, electric vehicle charging stations, and recycling facilities in schools.
- Industry partnerships to provide practical training opportunities for students.
- Teacher training initiatives supported by national and EU funding to equip educators with necessary competencies.
- Online learning platforms leveraging digital and AI-based resources to supplement traditional education.

Turkey:

- Turkey highlights the need for:
- Government support, with increased financial and administrative mechanisms for sustainability education.
- Industry partnerships to foster collaboration between VET institutions and businesses.
- Technical infrastructure development to enhance green technology training.

Conclusion

The successful integration of sustainability competencies in VET across Bulgaria, Italy, Romania, and Turkey requires a multi-faceted approach, combining financial investment, infrastructure

modernization, teacher training, industry collaboration, and digital learning resources. While progress is evident, continued governmental and institutional support remains essential for long-term impact.

VET Stakeholders Awareness and Commitment

This analysis presents the findings of experts on the level of awareness and commitment among VET stakeholders in Bulgaria, Italy, Romania, and Turkey regarding sustainability competencies and green skills.

Country-Specific Opportunities and Benefits

Bulgaria:

- Awareness of green skills is increasing but remains limited, with varying levels of commitment among educators and employers.
- There is a general lack of knowledge regarding European and international sector-specific sustainability standards.
- The importance of sustainability in the green and digital transitions is not yet fully recognized across the VET system.

Italy:

- The level of awareness and commitment among VET stakeholders varies, with a general trend toward improvement. Key observations include:
- Limited awareness and need for sensitization: While environmental topics are introduced in schools, time constraints and insufficient curricular focus hinder effective awareness-building. Greater visibility through media and public campaigns is needed.
- Individual commitment vs. institutional support: Some educators show personal interest in sustainability, but institutional backing and structured funding are needed to ensure long-term impact.
- Internal progress vs. external challenges: Schools are becoming more engaged in sustainability, but political and economic factors make it difficult for local industries to comply with strict regulations.
- Experiential learning and community engagement: Some VET institutions integrate hands-on sustainability projects, such as food sustainability and renewable energy initiatives, but public support remains limited.
- Improved sensitivity and institutional support: Municipalities have begun supporting sustainability projects, such as photovoltaic installations in schools, but further investment is required.
- Mixed commitment among enterprises: Businesses demonstrate varying levels of engagement, with some genuinely committed to sustainability, while others prioritize green initiatives for image enhancement. Regulatory frameworks like the EU Emissions Trading System (ETS) drive awareness, but infrastructure limitations hinder progress.

Romania:

- Awareness is growing among educators and VET institutions, but progress is uneven.
- Large enterprises tend to support green initiatives more than SMEs, which often lack resources or awareness.
- The government is implementing sustainability policies, but widespread adoption remains a challenge.
- A misalignment with labour market demands persists, as some employers do not yet prioritize sustainability competencies.

Turkey:

- There is growing societal acceptance of sustainability efforts.
- Awareness levels vary, with some sectors lagging due to enforcement challenges.
- Industry partnerships play a key role in promoting sustainability.
- Local businesses contribute to raising awareness, but systemic support is needed for broader impact.

Conclusion

While awareness of sustainability competencies and green skills in VET is increasing across Bulgaria, Italy, Romania, and Turkey, the commitment remains inconsistent, influenced by factors such as institutional support, industry engagement, and regulatory frameworks. To foster deeper integration, stronger policy enforcement, targeted funding, and experiential learning opportunities are required across all four countries.

Recommended Solutions

This section outlines expert recommendations on the most effective methods and strategies for improving sustainability competencies and green skills in VET.

Country-Specific Opportunities and Benefits

Bulgaria:

- Advanced Teacher Training: Implement targeted professional development in modern methodologies such as microlearning, game-based learning, experiential learning, project-based learning (PBL), and design thinking to enhance educators' teaching capabilities.
- Integration of Digital Technologies and Modern Pedagogies: Utilize digital platforms and virtual simulations as well as apply modern methodologies for flexible digital teaching and learning to create immersive learning experiences that facilitate the acquisition of green skills.
- Interdisciplinary Curriculum Design: Embed green competencies into existing VET programs through interdisciplinary approaches, fostering a holistic understanding of sustainability across multiple fields.

Italy:

- Experts emphasize the importance of practical engagement, interactive teaching, and experiential learning to foster sustainability competencies:
- Raising awareness through practical initiatives: Schools should integrate everyday eco-friendly practices (e.g., reducing paper towel use, promoting reusable bottles) and educate students on sustainability topics such as food waste and carbon footprints.
- Linking education with real-world experience: Encouraging internships and apprenticeships, both locally and internationally, ensures that students gain practical exposure to the application of green skills.
- Interactive and engaging teaching methods: Move beyond traditional lecture-based learning to participatory, hands-on approaches that require institutional support to be effectively integrated into curricula.
- Empirical learning and fieldwork: Expose students to real-world environmental challenges, such as waste management systems, biogas plants, and the fishing industry's ecological impact. Combating misinformation with scientifically backed knowledge is also critical.
- Practical laboratory work and applied learning: Hands-on, lab-based experiments are essential in VET programs, particularly in technical disciplines where students can directly observe the environmental impact of different practices.
- Instilling environmental values through education: Sustainability education should not only teach rules but cultivate long-term commitment to environmentally responsible practices, emphasizing maturity, critical thinking, and civic responsibility.

Romania:

- Project-Based Learning: Engage students in real-world sustainability projects, such as waste management initiatives and renewable energy installations.
- Enhanced Industry Collaboration: Strengthen internships and apprenticeships in sustainability-focused companies.
- Use of Digital Tools: Implement AI-driven learning, virtual reality (VR) simulations, and gamification to improve sustainability education.
- Comprehensive Teacher Training: Develop national training programs and support international exchanges (e.g., Erasmus+).
- Certification for Green Competencies: Introduce recognized qualifications to enhance the value of sustainability skills in the labour market.

Turkey:

- Regulatory Enforcement and Best Practice Dissemination: Strengthen policy implementation to ensure sustainability is effectively integrated into VET.
- Integration Across Disciplines: Embed sustainability principles into all vocational fields rather than treating them as standalone subjects.

- Digital Learning Tools and Project-Based Learning: Utilize digital resources, simulations, and collaborative projects to reinforce sustainability education.
- Industry Collaborations: Foster partnerships between VET institutions and businesses to provide practical, workplace-based sustainability training.

Conclusion

Across all four countries, the most effective strategies for strengthening sustainability competencies in VET include modernized teacher training, digital and experiential learning, interdisciplinary integration, industry partnerships, and regulatory enforcement. By bridging theoretical knowledge with practical applications, these approaches ensure that sustainability education remains relevant, impactful, and aligned with labour market needs.

Current Trends

This final sub-section presents expert insights on emerging trends in integrating sustainability competencies and green practices into Vocational Education and Training (VET) systems, considering the evolving demands of digitalization and environmental transformation.

Country-Specific Opportunities and Benefits

Bulgaria:

- Enhanced Multi-Stakeholder Collaboration: Strengthened cooperation among educational institutions, industry, and government bodies to embed sustainability principles into VET.
- Integration of Digital Tools and Effective Communication: Experts emphasize the integration of digital tools, evolving green job markets, and effective sustainability communication.
- Strategic Partnerships for Sustainable Development: Increased collaboration between VET providers, research institutions, universities, standardization bodies, and businesses through local, regional, and international projects aimed at implementing sustainability goals.

Italy:

- Integration of Digital and Green Practices: Digital tools and online platforms help reduce environmental impact by minimizing paper waste. The challenge remains in balancing digital and traditional learning resources.
- Historical Context and Technological Adaptation: Past sustainable practices, such as biofuels and renewable energy solutions, are being modernized with contemporary technologies. Sustainability must remain adaptable to evolving technologies.
- Green Jobs and Curriculum Development: The demand for energy managers, sustainability experts, and environmental lawyers is rising, necessitating new specialized curricula in VET programs. Additionally, integrating sustainability into existing fields like tourism and business offers further opportunities.
- Effective Communication for Engagement: Sustainability education must leverage modern communication strategies to engage students and the public.

- Sector Expertise and Collaboration: Emerging industries such as biofuels, hydrogen energy, and green architecture require specialized expertise. Partnerships with industry leaders and sustainability-focused businesses are essential for aligning education with market needs.
- Sustainability as an Ongoing Process: As green technologies evolve, education must emphasize continuous research and adaptation.

Romania:

- Increased Digitalization: AI, VR, and gamification are becoming integral to environmental education.
- Emphasis on the Circular Economy: VET programs integrate waste reduction and resource conservation principles.
- Focus on Renewable Energy Skills: Training expands in solar, wind, and energy-efficient technologies.
- Stronger Stakeholder Collaboration: Governments, educational institutions, and industry leaders are working together to promote sustainability education.
- Alignment with European Frameworks: The adoption of GreenComp and ESCO standards is helping standardize sustainability education across Europe.

Turkey:

- Human Capital and Collective Awareness: Promoting sustainability consciousness among students and educators.
- Alignment with International Green Policies: Ensuring that vocational education meets global environmental standards.
- Public-Private Partnerships: Strengthening cooperation between government, industry, and educational institutions.
- Adaptation to Emerging Green Professions: Updating curricula to reflect industry needs in sustainable fields.

Conclusion

Key trends in sustainability education in VET include digital transformation, interdisciplinary integration, collaboration with industry, adaptation to emerging green job markets, and continuous technological evolution. Aligning VET systems with sustainability standards and global green policies ensures that graduates are equipped with practical, future-proof green competencies.

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Recommendations and conclusions

Despite these efforts, sustainability competencies are not yet fully embedded in VET systems due to persistent challenges that hinder their effective implementation. A primary obstacle shared across all participating countries concerns the modernization of VET curricula, particularly in relation to sustainability and the green economy. To facilitate the seamless integration of green practices and sustainability competencies into VET programs, a more structured and comprehensive approach is required. Although some countries, such as Italy and Romania, have developed methodological benchmarks, including guidelines for integrating sustainability competencies into VET training programs, challenges remain. This highlights the need for well-designed frameworks to support the continuous professional development (CPD) of VET educators, with a particular focus on equipping them to incorporate sustainability principles effectively into their teaching practices.

Beyond curriculum modernization, additional challenges specific to certain countries further complicate the advancement of sustainability in VET. In Turkey, for instance, concerns have been raised regarding the quality and adequacy of learning facilities, as well as limited accessibility to vocational and technical education and low public awareness of VET opportunities.

Based on the findings from the desk research and expert interviews, as well as the identified needs and gaps, the following suggested policy changes, capacity-building strategies, and areas for further research and development can be outlined:

Suggested Policy Changes

- **Standardised curricula**: Developing and implementing standardised curricula that integrate sustainability competencies across all VET programs, ensuring consistency in educational offerings. This is strongly related to the efforts for developing national sustainability curriculum frameworks aligned with GreenComp while reflecting country-specific contexts to ensure uniform implementation across the VET sector at all levels.
- **Long-term funding commitments and financial incentives**: Establishing long-term funding mechanisms to support sustainability initiatives within VET, addressing current financial constraints that hinder effective implementation. Providing financial incentives (grants, tax benefits) to businesses that support green education initiatives will motivate businesses to collaborate more actively in developing relevant VET modules that offer green skill certifications recognized in the labour market. Increase government funding and EU support for schools to develop green infrastructure (e.g., renewable energy labs and waste recycling stations).
- **Incentives for industry collaboration**: Establishing incentives for industries to collaborate with VET institutions, fostering strategic partnerships that enhance practical learning opportunities for students while aligning curricula with labour market demands, and developing public-

private partnerships to facilitate hands-on sustainability training through apprenticeships and internships.

- **Enhanced environmental regulations**: Enhance regulatory frameworks requiring the integration of sustainability principles into vocational training, along with instruction in sector-specific green and sustainability management standards and standardization practices.

Capacity Building Strategies

- **Professional development for educators:** Implementing ongoing professional development programs focused on sustainability for VET teachers, enhancing their ability to incorporate green competencies into their teaching. Develop micro-credentials focused on green skills to reskill and upskill both students and working professionals providing more flexible and easily accessible training opportunities.
- **Resource development:** Creating and distributing resources and tools based on contemporary technology and approaches that aid educators in integrating sustainability topics into their curricula effectively.
- **Community awareness and engagement initiatives:** Foster sustainability awareness through green initiatives and local eco-projects, including awareness campaigns to enhance community participation in waste reduction, green energy, and conservation efforts. Initiate programs that engage local communities and businesses in VET, ensuring that training aligns with and reflects the local economic context.

Areas for Further Research and Development

- **Impact assessments of sustainability integration**: Research to assess the impact of integrating sustainability into VET on student outcomes, employment rates, and skills alignment with job market needs.
- **Technological innovations**: Investigating the role of digital tools and innovations in promoting eco-friendly practices within VET; this includes studying effective methods for reducing paper use and increasing digital adoption.
- **Sector Studies**: Conduct comprehensive studies on specific sectors (e.g., agriculture, construction, bioeconomy, renewable energy, etc.) to develop tailored approaches to effectively integrate sector- and domain-specific green practices and sustainability competencies.

Acronyms/Abbreviations

BIS	Bulgarian Institute for Standardization
CDP	Continuous Professional Development
CVET	Continuous Vocational Education and Training
EQF	European Qualifications Framework
IVET	Initial Vocational Education and Training
MES	Ministry of Education and Science
NAVET	National Agency for Vocational Education and Training
NQA	National Qualifications Authority
NQF	National Qualifications Framework
PBL	Project-based learning
PNRR	National Recovery and Resilience Plan
SDGs	Sustainable Development Goals
SES	State Educational Standard
UN	United Nations
VET	Vocational Education and Training
VETA	Vocational education and training Act
WBT	Work-based training

References

Ahmet Coşkun.(2024). Cumhurbaşkanlığı Sürdürülebilir Kalkınma Amaçları'nın Eğitim Programlarına Entegrasyonu Üzerine Bir Deneme-An Essay on the Integration of Presidential Sustainable Development Goals into Education Programmes

Board of Vocational Competences - MYK. (2015). Vocational Competences Framework

Bucovina Forestry College. (2024). Sustainable forestry management training in Romanian VET. Retrieved from https://www.bucovinaforestryschool.ro

Cedefop (2022) Teachers and trainers in a changing world: Bulgaria. Retrieved from https://www.cedefop.europa.eu/en/country-reports/teachers-and-trainers-changing-world-bulgaria

Cedefop (2022). Vocational education and training in Europe: National policy reports. European Centre for the Development of Vocational Training.

Cedefop (2023). Green skills and VET: Preparing the workforce for a sustainable future. Retrieved from https://www.cedefop.europa.eu/

Center, N. F. P. (2019). Italy mandates climate change education for all students. Retrieved from https://www.nycfoodpolicy.org/italy-mandates-climate-change-education-for-all-students/

Çalıştayı Raporu - Workshop Report on Integration of Awareness towards Climate Change into Primary Education

Council of EU (2020) Council Recommendation on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience.

EFVET. (2024). VET schools doing green. Retrieved from https://efvet.org/vet-schools-doing-green/

European Commission. (2021). Integrating sustainability in education and training: Policy developments in the EU. European Union.

European Commission. (2021). GreenComp: The European sustainability competence framework. European Union. https://data.consilium.europa.eu/doc/document/ST-13237-2020-INIT/en/pdf

European Commission. (2022). Green transitions in education and training: Policy developments in the EU. European Union.

European Commission. (2022). GreenComp: the European sustainability competence framework. Retrieved from GreenComp: the European sustainability competence framework: https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en

European Commission. (2023). The role of Erasmus+ and ESF in fostering sustainability competencies in VET. European Union

European Commission. (2023). The role of vocational education and training (VET) in the green transition. Retrieved from https://ec.europa.eu/education/

FAO. (2022). Sustainable agriculture and renewable energy integration. Food and Agriculture Organization.

Government of Romania. (2011). Law No. 1/2011 on National Education. Official Gazette of Romania.

Government of Romania. (2019). Government Ordinance No. 49/2019 on Dual Education. Official Gazette of Romania.

International Labour Organization (ILO). (2023). Green jobs and skills development: The role of VET systems. Retrieved from https://www.ilo.org

Italian Government. (2021). National Recovery and Resilience Plan: Investing in a sustainable future. Government of Italy.

Italian Ministry of Education. (2017). National Plan for Education for Sustainability. Government of Italy.

Italian Ministry of Education. (2020). Environmental Education and Green Skills Framework: Integrating sustainability into VET programs. Government of Italy.

Italian Ministry of Environment. (2021). The Italian Green New Deal: A pathway to sustainability. Ministry of Environment and Energy Security.

ITP 2024-2025: https://isj.vs.edu.ro/download/Nota-activitati-specifice-IPT-2024-2025.pdf?utm

Jones, P., Smith, L., & Brown, K. (2020). Sustainability education in vocational training: Global perspectives. Routledge.

MES - Ministry of Education and Science: https://web.mon.bg/mon/

MES Ordinance 13: https://lex.bg/en/laws/ldoc/2136914662

MES Strategy 2021-30: Strategic framework for education and training for the period 2021-30: https://www.mon.bg/nfs/2021/03/strategicheska-ramka_obrobuuchene_110321.pdf

Ministry of Education, Romania. (2017). Ministerial Order No. 3554/2017 on professional competencies and curriculum frameworks for VET institutions. Retrieved from https://www.edu.ro

Ministry of Education, Romania. (2023). National strategy for environmental education and climate change (2023–2030). Retrieved from https://www.edu.ro/sites/default/files/SNEM.pdf?utm

Ministry of National Education-MEB.(2024). Vocational and Technical Education Policy Document

Ministry of National Education-MEB.(2024). Türkiye Yüzyılı Maarif Modeli Ortak Metni

Ministry of National Education-MEB.(2024). Türkiye Yüzyılı Maarif Modeli Programı

Ministry of National Education-MEB.(2023). İklim Değişikliği Farkındalığının Temel Eğitime Entegrasyonu Çalıştayı Raporu - Workshop Report on Integration of Awareness towards Climate Change into Primary Education

National Authority for Qualifications, Romania. (2024). National occupational standards (NOS) for vocational training in agriculture, energy, and construction. Retrieved from https://www.anc.edu.ro

National Centre for Technical and Vocational Education and Training Development (CNDIPT). (2024). Curricular guidelines for technical and vocational education (IPT 2024-2025). Retrieved from https://isj.vs.edu.ro/download/Nota-activitati-specifice-IPT-2024-2025.pdf?utm

NAVET - National Agency for Vocational Education and Training: https://www.navet.government.bg/bg/

OECD. (2021). Green skills and workforce development: An OECD report. Organisation for Economic Co-operation and Development.

OECD. (2022). Education for sustainable development: Policies and practices in vocational training. Organisation for Economic Co-operation and Development.

OECD. (2023). Green skills for a sustainable workforce: International approaches and best practices. Organisation for Economic Co-operation and Development.

OECD. (2023). VET and the green transition: Aligning skills with labour market needs. Retrieved from https://www.oecd.org

Osnabruck Declaration (2020)
https://www.cedefop.europa.eu/files/osnabrueck_declaration_eu2020.pdf

Project "Modernization of Vocational Education and Training":
https://sf.mon.bg/?go=page&pageId=576

Romanian Government. (2024). National program for European Union accession - Sustainable development goals. Retrieved from https://gov.ro/fisiere/programe_fisiere/pnar-vol2.pdf?utm

Romanian Parliament. (2023). Law No. 307/2023 on the promotion of green competencies in education. Official Gazette of Romania.

Romanian Qualifications Authority (ANC). (2024). National Qualifications Framework (NQF) aligning with the European Qualifications Framework (EQF). Retrieved from https://www.anc.edu.ro

Smaniotto, C., Saramin, A., Brunelli, L., & Parpinel, M. (2022). Insights and next challenges for the Italian Educational System to Teach Sustainability in a global context. Sustainability, 15(1), 209.

Smith, J., & Brown, R. (2019). Education for Sustainability: Policy and practice. Springer.

Türkiye Maarif Vakfı.(2021). Uluslararası Maarif Dergisi-International Journal of Education: www.turkiyemaarif.org

UNESCO. (2020). Integrating Sustainability in Education: Global best practices. United Nations Educational, Scientific and Cultural Organization.

UNESCO. (2021). Green skills for sustainable development: Global education strategies. United Nations Educational, Scientific and Cultural Organization.

UNESCO. (2022). Education for sustainable development (ESD) in technical and vocational education and training (TVET). Retrieved from https://unesdoc.unesco.org/

UEFISCDI. (2024). Public policy proposal on micro-certifications in green skills within vocational education. Retrieved from https://uefiscdi.gov.ro/resource-866879-s4_propunere-pol-publice-micro-certificari.pdf?utm

VET Act (2024) https://lex.bg/laws/ldoc/2134673921

VETA (2018) Закон за професионалното образование и обучение: Retrieved fromhttps://www.navet.government.bg/bg/media/ZPOO-2018.pdf

APPENDIX: Best Practices

BULGARIA

Name	In-service Training for VET Tutors
Type and context	Massive Open Online Course (MOOC) International level
Duration \Period (year)	28 learning hours; 7 hours of discussion and f-2-f activities 2023
Provider	Erasmus+ project Green-4-Future Partners involved: Universität Paderborn (UPB); Burgaski Svoboden Universitet (BFU); Instituto de Soldadura e Qualidade (ISQ); University of Peloponnese (UOP); Universitatea din Pitesti (UPIT); Spectrum Research Centre CLG (SPECTRUM); Berufsförderungsinstitut Burgenland (BFI); Centre for advancement of research and development in educational technology Ltd. (CARDET)
Target group(s)	Vocational educators and all interested parties
Main aims	Green-4-Future proposes to create a range of learning materials that reconcile economic goals with environmental and climate goals. The main aim is to rethink the EntreComp Framework of Reference developed by the Joint Research Centre (JRC) of the European Commission and turn it into a green model Framework.
Description (methodology)	In-service Training Programme can be used by vocational educators to support their professional development. Vocational educators are empowered to develop their range of educational resources in an online environment. The training programme consists of two units: Learning Unit 1 covers self-directed learning related to the following topics: What is EntreComp? What is GreenEntreComp? The meaning of 'greening the competences'. Green Entrepreneurship and Business. Learning Unit 2 covers self-directed learning related to the following topics: Business Models – definition, description, and levels. Circular Economy - definition, characteristics, principles. Schools of thought in Circular Economy. Criticism of Circular Economy. Business Models for Circular Economy. Greening your Business. Circular Economy policies and legislative framework.
Conditions for success	The developed massive open online course is accessible for free to VET tutors (the main targets) and all interested parties. The course is delivered in Bulgarian, Croatian, English, German, Greek, and Portuguese languages.
GreenComp competencies addressed	Valuing sustainability, System thinking, Critical thinking, Problem framing, Adaptability, Political agency, Individual initiative
Required assets	The course and all resources integrated into it are digital and CC licensed (CC-BY-SA). The training materials are available online.
Link	https://elearning.green4future.eu/

Name	Micro-credential Circular Economy, Business Models and Green Standards
Type and context	Micro-credentials Online Course International level
Duration \Period (year)	75 learning hours 2024
Provider	Burgas Free University /BFU/

Target group(s)	VET, c-VET educators, university students, and professionals with HE backgrounds in economics and business studies.
Main aims	The course introduces trainees to fundamental concepts and terminology related to the circular economy. A core focus is the exploration of the 'eco-design' paradigm and methodologies for assessing material efficiency, drawing on the European and international standards CLC/TR 45550:2020, EN 45555:2019, EN ISO 14006:2020, and EN 45554:2020.
Description (methodology)	The course is developed by BFU within the Erasmus+ project B-Green-ED in collaboration with partners from Bulgaria, Lithuania, Romania, and Spain: Burgas Free University, Bulgarski Institut za Standartizacia, Asociatia De Standardizare Din Romania, Universitatea De Stiintele Vietii "Regele Mihail I Al Romania" Din Timisoara, Universitat Politecnica De Valencia, Mykolo Romerio Universitetas. This self-directed online course is available after registering. The course encompasses the following modules: Module 1. Circular economy, green business models and material efficiency: circular economy, green business and green entrepreneurship; green business models and their categorization; nature of standards, types of standards, standardization process, standards and legislation; definitions related to material efficiency according to standard CLC/TR 45550:2020. Module 2. General methods for assessing the recyclability and recovery of energy-related products: scope of standard EN 45555:2019; assessing the possibility of recycling/recovery of energy-related products; recycling optimization; evaluation of the possibility of recycling and recovery. Module 3: Eco-design of environmental management systems - basic guidelines: scope of standard EN ISO 14006:2020; environmental management systems - basic terms and definitions; eco-design related fundamental concepts. Module 4 (optional module): General methods for assessing the repairability, reusability and upgradeability of energy-related products: scope of standard EN 45554:2020; basic terms and definitions; identifying the evaluation parts documenting the assessment results. All participants who pass successfully the assessment procedures (formative and summative) receive a certificate issued by BFU with an equivalent in ECTS - 3.
Conditions for success	The developed online course is accessible to all interested individuals with a higher level of education in economy and business studies, including VET and c-VET tutors. The course is delivered in Bulgarian and English languages.
GreenComp competencies addressed	Valuing sustainability, System thinking, Critical thinking, Problem framing, Adaptability, Exploratory thinking, Individual initiative
Required assets	The course and all resources integrated into it are digital and CC-licensed (CC-BY-SA). The course is accessible after registering on the BFU platform.
Contact / References	BFU; Link to the courses category on the BFU platform https://e-learn.bfu.bg/course/index.php?categoryid=39 ; Direct link to the course in Bulgarian: https://e-learn.bfu.bg/course/view.php?id=1282 Direct link to the course in English: https://e-learn.bfu.bg/course/view.php?id=1324

Name	**Micro-credential Electronics and Communication of Renewable Energy Sources**
Type and context	Micro-credentials Online Course International level
Duration \Period (year)	75 learning hours 2024
Provider	Burgas Free University /BFU/

Target group(s)	VET, c-VET educators, university students, and professionals with HE backgrounds in the field of engineering studies
Main aims	The course introduces trainees to fundamental concepts and terminology related to energy efficiency and renewable energy sources (RES) and grid integration of renewable energy production introduced by standards EN ISO/IEC 13273-2:2015, EN ISO 50001:2018 and EN IEC 62934:2021.
Description (methodology)	The course is developed by BFU within the Erasmus+ project B-Green-ED in collaboration with partners from Bulgaria, Lithuania, Romania, and Spain: Burgas Free University, Bulgarski Institut za Standartizacia, Asociatia De Standardizare Din Romania, Universitatea De Stiintele Vietii "Regele Mihail I Al Romania" Din Timisoara, Universitat Politecnica De Valencia, Mykolo Romerio Universitetas. This self-directed online course is available after registering. The course encompasses the following modules: Module 1: Circular economy, standardization and standards, energy efficiency and renewable energy sources (RES) Module 2: Energy management systems - requirements, principles and rules of operation Module 3: Grid integration of renewable energy production All participants who pass successfully the assessment procedures (formative and summative) receive a certificate issued by BFU with an equivalent in ECTS - 3.
Conditions for success	The developed online course is accessible to all interested individuals with a higher level of education in economy and business studies, including VET and c-VET tutors. The course is delivered in Bulgarian and English languages.
GreenComp competencies addressed	Valuing sustainability, System thinking, Critical thinking, Problem framing, Adaptability, Exploratory thinking, Individual initiative
Required assets	The course and all resources integrated into it are digital and CC-licensed (CC-BY-SA). The course is accessible after registering on the BFU platform.
Contact / References	BFU; Link to the courses category on the BFU platform https://e-learn.bfu.bg/course/index.php?categoryid=39 ;Direct link to the course in Bulgarian: https://e-learn.bfu.bg/course/view.php?id=1283 ; Direct link to the course in English: https://e-learn.bfu.bg/course/view.php?id=1323

Name	**Waste Management and Industrial Pollution Control Standards**
Type and context	Micro-credentials Online Course International level
Duration \Period (year)	25 learning hours 2024
Provider	Universitat Politecnica De Valencia /UPV/
Target group(s)	VET, c-VET educators, university students, and professionals with technical backgrounds in the field of engineering studies
Main aims	The course aims to familiarize trainees with the content of waste management and industrial pollution control standards. The following processes are addressed in the course from the perspective of waste production: the analysis of Greenhouse Gas (GHG) emissions, plastic waste recovery, packaging and waste collection and transportation.
Description (methodology)	The course is developed by UPV within the Erasmus+ project B-Green-ED in collaboration with partners from Bulgaria, Lithuania, Romania, and Spain: Burgas Free University, Bulgarski Institut za Standartizacia, Asociatia De Standardizare Din Romania, Universitatea De Stiintele Vietii "Regele Mihail I Al Romania" Din Timisoara, Mykolo Romerio Universitetas This self-directed online course is available after registering. The course encompasses the following modules:

	Module 1.- Greenhouse gas emissions: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (ISO 14064-1:2019). Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements (ISO 14064-2:2019). Module 2.- Plastic waste, packaging and waste collection basics: Guidelines for the recovery and recycling of plastics waste (ISO 15270:2008). General requirements for the use of ISO standards in the field of packaging and the environment (ISO 18601:2013). Optimization of the packaging system (ISO 18602:2013). Waste collection and transportation management — Vocabulary (ISO 24161:2022) All participants who pass successfully the assessment procedures (formative and summative) receive a certificate issued by BFU with an equivalent in ECTS – 1.
Conditions for success	The developed online course is accessible to all interested individuals with a higher level of education in technical and engineering studies, including VET and c-VET tutors. The course is delivered in Spanish and English languages.
GreenComp competencies addressed	Valuing sustainability, System thinking, Critical thinking, Problem framing, Adaptability, Exploratory thinking, Individual initiative
Required assets	The course and all resources integrated into it are digital and CC-licensed (CC-BY-SA). The course is accessible after registering.
Contact / References	BFU Link to the platform: https://cerizone.eu/czmoodle/course/index.php?categoryid=20 Direct link to the course in English: https://cerizone.eu/czmoodle/course/view.php?id=85

Name	**"Green Generations" Teacher Training Package**
Type and context	Training resources International level
Duration \Period (year)	2023
Provider	Eutopique, France
Target group(s)	School teachers
Main aims	The training package offers capacity-building tools and resources for building teachers' skills towards the pedagogical approach of intergenerational climate change education.
Description (methodology)	The training package is developed within the international project Green Generations by a consortium involving the following organisations from France, Bulgaria, Greece, and Romania: Eutopique; Stimmuli O.E.; Know and Can Association; SYNTHESIS Center for Research and Education Limited ; 1st Elementary School of Alexandria; Centrul Judetean de Excelenta. The package includes the following modules: Introduction to intergenerational climate change education; Teaching principles in intergenerational learning; Putting Teaching techniques in practice; Assessing intergenerational learning.
Conditions for success	The developed materials are addressed to all school teachers but could be used by educators in all education and training settings. The materials are available in Bulgarian, English, French, Greek and Romanian languages.
GreenComp competencies addressed	Valuing sustainability, System thinking, Critical thinking, Problem framing, Adaptability, Exploratory thinking, Individual initiative
Required assets	The developed open educational resources are CC-licensed (CC-BY-SA) and are available on the project website.

Contact/Link	BFU ; Link to the training package: https://greengenerations.eu/en/training-resources.html

Name	**"Integrating Green Practices into VET Curricula"**
Type and context	Training programme International scope of practice
Duration \Period (year)	Duration - one year 01.06-10.06.2024 Mobility
Provider	Provider PGMEE coordinator in partnership with Crana College, Buncrana Crana Rd, Ardaravan, Irishwomen, Co. Donegal, Ireland
Target group(s)	VET teachers
Main aims	Increasing the professional qualification of teachers, improving their skills and competencies to integrate green practices into VET curricula and improving the teaching/learning process.
Description (methodology)	A 10-day mobility to follow up on work and exchange good practices in the form of presentations, demonstrations, practical exercises, classroom visits and discussions, held at Crana College, Buncrana, Ireland. Introduction of topics into VET curricula.
Conditions for success	PGMEE's integration of mobility results is ongoing in 2024/2025, with vocational training teachers incorporating relevant topics into their lessons. Inspired by mobility, the team applied for "Green Entrepreneurship" as an innovative school initiative, launching in 2024 for three years. A photovoltaic installation was completed in the summer of 2024, and waste collection areas were set up. Mobility insights are also applied in general education subjects. A new STEM centre for natural sciences is under construction, focusing on green technologies and experiments. The school is designing an electric car for the 2025 Eco Shell Marathon and preparing to apply for a green flag
GreenComp competencies addressed	Enhancing teacher qualifications in line with VET educational policy priorities in electrical engineering and electronics; integrating sustainability into curricula; supporting the transition to a low-carbon, climate-resilient economy; promoting a whole-school approach to sustainable development; implementing classroom projects on sustainability; fostering creativity, logical thinking, and workplace readiness; strengthening monitoring and methodological support; and improving the learning process and school environment.
Required assets	Emphasizing green skills for future professions in VET; integrating sustainability into curricula; planning curriculum greening; equipping teachers with relevant competencies; sharing best practices from Ireland; leveraging innovative technologies in electrical and electronic engineering; addressing emerging labor market needs; establishing a whole-school approach to sustainability; fostering collaboration between schools, businesses, and communities; implementing classroom sustainability projects; promoting environmental awareness and responsible actions; and empowering students as sustainability ambassadors..
Link \ Contact References	LINK

Name	**Innovation "Green Entrepreneurship for a Sustainable Future"**
Type and context	Project National
Duration \Period (year)	September 2024 to 2027 – 3 years
Provider	Provider Vocational High School of Mechano-Electrical Engineering and Electronics - PGMEE
Target group(s)	Class teachers, general education teachers and VET teachers in the VIII grade students of VIII grade

Main aims	The innovation aims to develop students' initiative and entrepreneurship as a lifelong skill through guided initiatives and practices. It seeks to create a school ecosystem that fosters sustainability and environmental responsibility by raising awareness of resource management, waste recycling, and the circular economy. Students will acquire green skills essential for 21st-century professions, shaping new values and behaviors aligned with sustainable development. Ultimately, this will enhance the quality of education at PGMEE.
Description (methodology)	The project will engage high school students over the years, fostering entrepreneurial ideas and eco-friendly thinking. Its objectives and activities align with the *Framework Requirements for Environmental Education*, covering water, soil, air, energy, climate, consumption, waste, and society-environment interactions.
Conditions for success	Educational Activities Green Knowledge & Skills: Develop competencies for future professions and entrepreneurship through interdisciplinary learning. Curriculum Integration: Incorporate green topics into general education and class lessons. Technology Use: Explore apps, websites, virtual labs, and online platforms for recycling awareness and sustainability education. Workshops & Lectures: Collaborate with partners, municipalities, and universities to educate students on sustainable development. Environmental Projects & School Initiatives Reducing Ecological Footprint: Develop projects on energy efficiency, waste management, digital sobriety, and green spaces. Eco-Engagement: Organize school-wide events, eco-discussions, quizzes, and class-level projects. Entrepreneurial Learning: "Green workshops" where students create business plans for sustainable ventures. Circular Economy & Bioeconomy: 10th-grade projects on renewable and biodegradable resources. Collaboration with Local Businesses Industry Partnerships: Engage with companies specializing in green technologies. Knowledge Exchange: Host events where entrepreneurs share insights on sustainability. Evaluation & Impact Measurement Environmental Impact: Assess progress toward a "zero" footprint. Student Engagement: Measure participation and commitment to sustainability initiatives.
GreenComp competencies addressed	Fostering Green Thinking & Entrepreneurship Students will develop sustainable habits and take an active role in identifying and solving real-world problems as entrepreneurs. Through a cyclical process, they will progress through stages with specific goals.
Required assets	Resources & Partners: Teachers, students, and staff. Environmental experts and consultants. Local businesses and green technology entrepreneurs.
Link \ Contact References	PGMEE https://pgmee.com/wp/2024/10/18976/ Topics in the Red Cross: “Green behavior” - how to live in a cleaner world “Environmental disasters”; “Human activity and nature”; “Fires - forest and field”; “In the class with climate change”; “Global warming and what can I do” Registration for the project "Wings of Burgas" under the program "Live in the circle! Solve the problem!" https://s.shopeee.com/IEDt https://s.shopeee.com/pO7A https://s.shopeee.com/f3Nv https://s.shopeee.com/mAnp https://s.shopeee.com/DwaK https://accdox.com/xaknj

Name	„Exchange of good practice and innovation in vocational education: STEAM and AI technologies for the future of technical majors"
Type and context	Training program International (in progress)
Duration/ Period(year)	27.10.2024 – one year
Supplier	PGMEE
Target group(s)	Vocational teachers
Main objectives	Improved professional qualifications and skills in terms of curricula and assessment in vocational education in Spain, the integration of STEAM in the educational process, the use of artificial intelligence (AI) in vocational education, the different models of vocational education and the exchange of good practices, developing ideas for inter-school projects and collaborations at European level, implementing technological innovations in the classroom and gaining insight into industry links and broadening knowledge of labor market needs.
Description (methodology)	10-day mobility to follow work and exchange good practices in the form of presentations, demonstrations, practical exercises, classroom visits and discussions. getting to know the education system in Spain: • curricula and assessment in vocational education in Spain • Integration of STEAM in the educational process • Use of artificial intelligence (AI) in vocational education • STEAM projects and inter-school cooperation
Conditions for practice success	internal – acquisition of practical skills for integrating STEAM in lessons. Gaining knowledge about the use of AI in the educational process and developing ideas for implementation. Development of practical exercises for the integration of AI technologies in professional areas. Expanding knowledge about different models of professional education and exchange of good practices. external – developing ideas for inter-school projects and cooperation at European level.
GreenComp competencies reviewed	Improving the skills to implement technological innovations in the classroom. Development of technological resources for lessons. Work on creating interactive resources for technical disciplines.
Assets required	Fixed assets - clear vision to apply learning and plan implementation steps. Each participant develops a plan to implement the learned methods and technologies.
Contact \ References	PGMEE; https://s.shopeee.com/vty6 ; https://accdox.com/l5fxw

Name	Good Green Practices
Type and context	workshop, conference, project National
Duration \ Period (year)	2024 – two years
Supplier	„Green Strandja“, PGMEE
Target group(s)	students
Main objectives	Seminars, conferences and projects promote innovation, sustainable development and ecological thinking. The main goals and objectives include: 1. Stimulating innovation in green technologies, supporting the development of new environmental solutions. Promotion of research and development. Support for start-ups and entrepreneurs in the field of sustainable technologies.

	2. Increasing environmental awareness Informing the public about the importance of environmental protection. Involvement of young people, students and pupils in topics related to ecology. Promotion of good practices and technologies to reduce the carbon footprint. 3. Support for sustainable development Attracting the attention of business and industry to environmental solutions. Promoting the circular economy and energy efficiency. Stimulating the development of renewable energy sources. 4. Creating networks and partnerships Bringing together experts, scientists, entrepreneurs and investors. Promotion of international cooperation in the field of green technologies. Creating a platform for exchange of knowledge and experience. 5. Practical application of technologies - Supporting the implementation of successful projects. Tests and demonstrations of innovative solutions in real conditions. Providing funding and support for promising ideas.
Description (methodology)	Organization of seminars, contests and competitions • Climate fresco in PGMEE: Awareness and responsibility towards nature - board game, innovative workshop on the topic "Climate fresco. An event that is part of a global initiative to raise awareness about the climate crisis and its impact on our lives. • Activities for cleaning and getting to know the nature of Strandzha mountain. • AI for Environmental Sustainability boot camp - deploying skills in AI and ecology, with the ambition to find innovative solutions to some serious environmental challenges. Students develop their projects, combining theoretical knowledge with practical solutions for environmental sustainability. • Competition - a model of a photovoltaic plant - environmental protection • European Blue School • National ecological conference "Let's think ecologically for the future" - the scientific topic: "Grapes - food and medicine"
Conditions for practice success	Internal - Access to advanced technologies, digital platforms for collaboration, data analysis and development of environmental projects. Teaching materials for environmental education and innovation. Training of teachers and mentors. Specialized training in green technologies and STEM. Creation of innovation clubs and eco-clubs. Encouraging critical thinking, creativity and teamwork. Presence of competitive spirit and prize incentives for students. External - synergy between schools, universities, businesses and institutions
GreenComp competencies reviewed	innovative thinking, systems approach and entrepreneurial skills in sustainable development.
Required assets	Human expertise, technological infrastructure, financial resources and training materials.
Contact \ References	PGMEE; https://pgmee.com/wp/2024/11/19126/ ; https://accdox.com/ulbby ;https://s.shopeee.com/VUZR ; https://s.shopeee.com/InJu ;https://s.shopeee.com/6uAd ; https://s.shopeee.com/viwd ;https://s.shopeee.com/AXke

Name	**"Modernization of Vocational Education"**
Type and context	Category - project National (in progress)
Duration \ Period (year)	2023 – 4 years
Supplier	Ministry of Education and Sciences

Target group(s)	Teachers and students, employers
Main objectives	Project Objective Enhancing VET to align with labor market dynamics and equip students with skills for present and future professions. Specific Objectives: – Modernizing VET through collaboration between schools, businesses, and institutions. – Enhancing skills and competencies of teachers and students in partnership with industry. – Increasing the attractiveness of vocational education and training.
Description (methodology)	Key Actions for VET Enhancement 1. Develop and implement an updated List of Professions, education standards, curricula, and exam programs with Sector Skills Councils. 2. Introduce competence profiles and specialized training for vocational teachers. 3. Implement flexible learning paths and micro-qualifications for mobility across professions and sectors. 4. Develop digital and AI-powered learning materials for key economic sectors. 5. Engage industry, academia, and NGOs in VET teacher training. 6. Provide specialized training for teachers on the digital and green economy, blue growth, and Industry 5.0. 7. Enhance students' transversal skills, entrepreneurship, and social entrepreneurship through employer collaboration. 8. Expand professional training with real-world work placements. 9. Promote VET through campaigns linking students, parents, employers, and local authorities for career guidance.
Conditions for practice success	Internal - Training and qualification of teachers, access to modern technologies, artificial intelligence, flexibility of curricula. External – support from institutions, social continuity and commitment.
GreenComp competencies reviewed	1. Mastering Sustainable Development – Teacher training on green skills, blue growth, and Industry 5.0 to deepen understanding of sustainable development principles. 2. Systems Thinking for Sustainability – New curricula introducing an interdisciplinary approach, integrating economic, social, and environmental aspects for sustainable professions. 3. Critical Thinking about Sustainability – Collaboration with employers to create real case studies, encouraging students to analyze industry impacts on the environment. 4. Changing Practices – Promoting student practices in real work environments to learn sustainable production, renewable technologies, and eco-friendly methods.
Required assets	Human Resources - Vocational training teachers, business mentors, teachers. Material and technological resources - digital learning content, including e-textbooks, multimedia lessons, educational applications, VR and AI technologies. Financial resources
Contact \ References	PGMEE; https://url-shortener.me/4RA ; https://url-shortener.me/4RC https://url-shortener.me/4RD

ITALY

Name	**Italy's National Climate Change Education Initiative**
Type and context	Lesson Plans National level
Duration \Period (year)	Implemented in 2019, ongoing
Provider	Italian Ministry of Education

Target group(s)	Students in schools across Italy
Main aims	Introduce mandatory climate change education; foster a culture of sustainability among students.
Description (methodology)	Climate education is integrated into weekly lessons across subjects, supplemented with environmental projects and activities. Italian schools will dedicate nearly one hour a week to discussing climate change issues at the start of the next academic school year. This practice is: **Innovative**: This initiative incorporates cutting-edge pedagogical methods and digital tools to engage learners in climate science, fostering awareness and action-oriented behaviours for sustainability. **Inclusive**: It is designed to reach a broad audience, integrating diverse cultural perspectives and making educational resources accessible across Italy's varied socio-economic contexts. **Effective**: The initiative has demonstrated success through increased climate literacy among educators and students, enhancing competencies in sustainability education. **Transferable**: Its structured approach and use of open-access resources make it adaptable to other countries or institutions aiming to enhance climate education. **Impact**: Empowering educators with relevant skills has a cascading effect on learners' ability to practically address climate challenges. **Scalable and Replicable**: Its modular design and national policy support ensure it can be scaled across regions or replicated in similar educational systems globally.
Conditions for success	Strong institutional support, teacher training, and curriculum integration.
GreenComp competencies addressed	Systems thinking, future-oriented thinking, and environmental responsibility.
Required assets	Government policies, teacher training materials, and lesson plans.
Link \ Contact References	https://www.earthday.org/italy-first-country-climate-change-studies-in-schools/

Name	**RiGenerazione Scuola (School ReGeneration) Plan**
Type and context	Strategic Plan National level
Duration \Period (year)	Launched in 2021, ongoing
Provider	Italian Ministry of Education
Target group(s)	Schools, educators, and students
Main aims	Promote sustainability through ecological and cultural transitions in schools. In addition, there is the Green community, which launches project paths for schools and shares skills and experience to set sustainability in motion in schools. The projects proposed by the regenerators can be consulted by geographical area. The Green community offers workshops, resources, and a platform for educators to collaborate on green education initiatives. This practice is: Innovative: Combines environmental education with hands-on sustainability projects, embedding green practices within school operations and curricula. Inclusive: Emphasises participation from diverse student demographics, promoting equity

	and inclusivity in environmental education. Effective: Evidence of success includes schools integrating green practices and measurable changes in students' attitudes and behaviors toward sustainability. Transferable: Its framework is adaptable to other educational systems, balancing localised actions with universal sustainability principles. Impact: Fosters eco-conscious behaviours and skills among educators and students, promoting long-term cultural shifts toward sustainability. Scalable and Replicable: Supported by Italy's Ministry of Education, it is designed for nationwide implementation and could be replicated internationally with localised adjustments.
Description (methodology)	• Encourages schools to adopt green practices, integrate sustainability topics, and create green communities. • Integrate green thinking into education and provide support for environmental education practices.
Conditions for success	Government funding, community engagement, active community participation, access to resources, and institutional engagement.
GreenComp competencies addressed	Action for sustainability, eco-design thinking, and collaborative engagement.
Required assets	School partnerships, green technology, educational materials, access to digital platforms, community networks, and resource libraries.
Link \ Contact References	https://www.istruzione.it/ri-generazione-scuola/ https://www.istruzione.it/ri-generazione-scuola/home.html

Name	**Toolkit - Skills for the Green Transformation**
Type and context	Guidelines, training offers, toolkit International
Duration \Period (year)	Published in January 2023
Provider	VET Toolbox – GIZ (https://www.giz.de/en/aboutgiz/identity.html)
Target group(s)	VET educators, curriculum developers, policymakers
Main aims	Provide practical tools and guidelines to integrate green skills into VET curricula.
Description (methodology)	The toolkit offers strategies for embedding sustainability into curricula, linking green hands-on practices to teaching and learning, and fostering community interaction focused on green skills. The Skills for the Green Transformation Toolkit is an interactive PDF offering practical examples of approaches and steps to achieve green transformation, divided into eight key approaches, each with multiple project examples. It highlights current efforts in green skills development and their contributions to sustainability. The Skills for the Green Transformation Dashboard maps projects by VET Toolbox partners, showcasing diverse, context-specific initiatives on green skills and sustainability. Users can explore these by country, SDGs, sectoral focus, and other filters. Both resources, developed by GIZ, VET Toolbox partners (AFD, Expertise France, British Council, Enabel, LuxDev), and global leaders like UNESCO, ILO, and OECD, can be used independently or together to provide insights into approaches, tools, processes, and initiatives for driving the green transformation. This practice is:

	Innovative: Offers a dynamic and interactive resource for educators and trainers, combining practical examples and innovative approaches to green transformation. Inclusive: Includes diverse global examples, ensuring relevance to various socio-economic and cultural contexts. Effective: Widely recognised for enhancing VET trainers' knowledge and competencies in green skills, fostering sustainability in vocational education. Transferable: The toolkit's modular format allows it to be easily adapted to different sectors and educational systems. Impact: Equips trainers with actionable tools to implement green skills training, advancing sustainable practices in VET systems. Scalable and Replicable: Its digital nature and open accessibility support widespread adoption in multiple contexts.
Conditions for success	Institutional commitment, availability of resources, and collaboration among educators and industry stakeholders.
GreenComp competencies addressed	Systems thinking, sustainability mindset, and promoting sustainable actions.
Required assets	Access to the toolkit, training for educators, and supportive institutional policies.
Link \ Contact References	https://vettoolbox.eu/publications/skills-for-green-transformation/ https://vettoolbox.eu/wp-content/uploads/2023/01/S4GT_Toolkit.pdf

Name	**A Compendium of Inspiring Practices**
Type and context	Guidelines and Instructions National, European
Duration \Period (year)	Published in 2023
Provider	European Commission
Target group(s)	VET providers, educators, policymakers
Main aims	Showcase practical ways to green VET, including integrating sustainability in curricula and staff training.
Description (methodology)	The compendium presents various "green" activities, such as curriculum integration, staff training, and collaboration through networks, to support the green transition in VET. This practice is: Innovative: Highlights novel and diverse practices in sustainability education, showcasing unique approaches and solutions from around the world. Inclusive: The compendium ensures a global representation of practices, addressing varied socio-economic and cultural contexts. Effective: Provides tangible examples of success in developing sustainability competencies, serving as a model for VET trainers. Transferable: The documented practices are structured to be adapted and implemented in diverse settings, offering actionable insights for other contexts. Impact: Enhances the capacity of VET trainers by showcasing proven strategies, inspiring further innovation and application. Scalable and Replicable: The collection's accessibility and breadth of examples facilitate broader application and scaling efforts.
Conditions for success	Engagement of VET institutions, continuous professional development for staff, and policy support.

GreenComp competencies addressed	Environmental literacy, sustainable development, and green skills application
Required assets	Access to the compendium, willingness to adopt best practices and institutional support.
Link \ Contact References	https://interregvlaned.eu/uploads/vocational-education-and-training-and-the-green-transition-KE0124004ENN.pdf

Name	**Collaboration with the Italian Alliance for Sustainable Development (ASviS)**
Type and context	Cooperation Plan National Level
Duration \Period (year)	Initiated in 2016; ongoing with regular renewals
Provider	Italian Ministry of Education and Merit (MIM), in collaboration with ASviS
Target group(s)	VET institutions, educators, and students
Main aims	Integrate sustainability into education by sharing information and best practices, developing curricula, and providing teacher training.
Description (methodology)	This initiative uses a multi-pronged approach: 1. Resource Sharing: ASviS provides VET institutions with guides, reports, and tools for embedding sustainability in teaching and learning processes. 2. Curriculum Development: Collaboration with educators to embed green topics such as renewable energy, circular economy, and sustainable practices into technical and vocational programs. 3. Teacher Training: Organises workshops and seminars for educators to build their capacity in teaching sustainability concepts and linking them to real-world applications. 4. Monitoring and Support: Continuous engagement through feedback sessions and improvement of resources based on practical implementation outcomes. This practice is: Innovative: Leverages a multi-stakeholder approach, integrating sustainability across education, policy, and industry sectors. Inclusive: Ensures representation and input from diverse groups, promoting equity in developing sustainable initiatives. Effective: This has resulted in concrete policy recommendations and capacity-building initiatives that enhance sustainability competencies in education. Transferable: The collaborative framework can be adapted by other countries or organisations aiming to strengthen partnerships for sustainable development. Impact: Drives systemic change by embedding sustainability in education and vocational training at institutional levels. Scalable and Replicable: The collaborative model is scalable and replicable, especially in regions with strong educational and policy actors networks.
Conditions for success	Strong partnership between MIM and ASviS, commitment from VET institutions, and continuous funding.
GreenComp competencies addressed	Systems thinking, sustainability mindset, and promoting sustainable actions.
Required assets	Access to ASviS resources, training materials, and support from educational authorities.
Link \ Contact References	https://op.europa.eu/webpub/eac/education-and-training-monitor/en/country-reports/italy.html#4-vocational-education-and-training

Name	Integration of Green Skills in ITS Academies
Type and context	Strategy Plan National
Duration \Period (year)	Ongoing since 2022
Provider	Italian Ministry of Education and Merit (MIM)
Target group(s)	Students enrolled in ITS Academies
Main aims	To develop green skills through innovative VET programs in technological areas such as sustainable mobility and energy efficiency.
Description (methodology)	The ITS (Istituti Tecnici Superiori) Academies have implemented a structured methodology to introduce green skills: 1. Program Design: Green skills are embedded in the curriculum with specific modules on energy efficiency, sustainable mobility, and advanced green technologies. 2. Hands-on Learning: Students participate in industry internships, project-based learning, and simulations to apply green concepts in real-world scenarios. 3. Collaboration with Industry: Partnering with green technology companies to ensure that training aligns with current industry needs and standards. 4. Evaluation and Feedback: Regular assessments to measure students' competencies and adapt teaching methodologies accordingly. This practice is: Innovative: Embeds green skills into technical curricula, aligning vocational education with industry needs for sustainability. Inclusive: Targets a wide range of learners, ensuring access to green skills training regardless of socio-economic status. Effective: Demonstrates measurable improvements in student employability and alignment with green job market demands. Transferable: The integration approach can be replicated in other technical and vocational institutions worldwide. Impact: Develop a workforce equipped with critical green skills, supporting broader sustainability goals. Scalable and Replicable: Its alignment with national priorities and industry partnerships ensures scalability across sectors and regions.
Conditions for success	Adequate funding, industry partnerships, and updated curricula aligned with green technologies.
GreenComp competencies addressed	Environmental literacy, sustainable development, and green technology application
Required assets	Modern training facilities, industry-standard equipment, and qualified instructors.
Link \ Contact References	https://op.europa.eu/webpub/eac/education-and-training-monitor/en/country-reports/italy.html

Name	GreenVET Pathway Project
Type and context	Project International
Duration \Period (year)	Ongoing

Provider	GreenVET Pathway Consortium
Target group(s)	VET schools, educators, and students
Main aims	To support VET schools in practising a whole institution approach to sustainability.
Description (methodology)	This project follows a comprehensive institutional approach: 1. Whole-Institution Engagement: Involves all stakeholders, including educators, students, and administrative staff, in sustainability initiatives. 2. Curriculum Revision: Review and update existing curricula to include modules on green competencies such as waste management, renewable energy, and eco-design. 3. Toolkits and Resources: Provide institutions with detailed guides, templates, and digital tools to implement sustainability practices effectively. 4. Community Partnerships: Collaborates with local businesses and organisations to create learning opportunities and integrate real-life sustainability challenges into the curriculum. 5. Evaluation Framework: Develop metrics to monitor the integration of green competencies and their impact on students' learning outcomes. This practice is: Innovative: Combines interdisciplinary training with cutting-edge technologies and methodologies to equip trainers and learners with green competencies. Inclusive: Engages diverse stakeholders and ensures accessibility for marginalised groups, promoting equity in green education. Effective: Demonstrates significant outcomes in improving trainers' and students' sustainability knowledge and skills. Transferable: The project's collaborative approach and resources make it adaptable to various educational systems and contexts. Impact: Strengthens the capacity of VET trainers to implement sustainability in practice, supporting industry and societal transitions toward green economies. Scalable and Replicable: Given sufficient institutional support, its success and methodology make it a strong candidate for scaling across Europe and beyond.
Conditions for success	Commitment from VET institutions, access to resources, and engagement of the entire school community.
GreenComp competencies addressed	Sustainability mindset, collaborative engagement, and implementation of sustainable practices.
Required assets	Access to project resources, training for educators, and institutional support.
Link \ Contact References	https://green-vet.eu/content/it/index.html

Name	**RETE SCUOL@GENDA 2030**
Duration \ Period (year)	2018 - ongoing
Provider	The schools involved in the Rete, in the meeting of 6th September 2018, appointed the Direzione Didattica 4° Circolo " Sigismondo Castromediano", as a school leader of the Rete. The Department of the Educational System guarantees the general supervision of the Rete by the Italian MIUR, to which the School leader will provide constant information and report on the scheduled activities.
Target group(s)	DD 4th circle " Sigismondo Castromediano " Lecce, IC " Corradini " Rome IC " Torelli Fioritti " Apricena (Foggia), IC" Chieri 1" Chieri (Turin) IC "G. D'Annunzio" – Salò (Brescia), IISS of Rossano Calabrian (Cosenza) IISS "A. Pacinotti " Taranto, ITS "A. Bianchini " – Terracina (Latina) DD 5th circle "De Amicis " Livorno, IC "Elia Commenda " Brindisi

	IC “San Nilo ” Grottaferrata (Rome), IC “Paolo Soprani ” Castelfidardo (An) IC “Rita Levi Montalcini ” Partanna (Trapani), SSIG “Madonna Della Neve” Adro (Brescia), IISS “ Princess Maria Pia” Taranto IIS “ Mattei ” Fiorenzuola D'Arda (Piacenza), CPIA School Secondary School I Grade Parma, IC 4° “G. Verga ” Siracusa , Institute “San Paolo” Polyclinic Sorrento
Main aims	The present Rete agreement was born from the joint commitment of the Italian-involved schools and the winning competition of the MIUR – ASVIS Competition: “*Let's make 17 Goals: transforming our world: the 2030 Agenda for Sustainable Development*. The mission for all is to develop knowledge skills in the community school and in territories of respective competence for present and future generations. PURPOSE OF THE NETWORK: •Spread knowledge of the UN Agenda 2030 with training initiatives throughout the country, including through the collection and documentation of innovative good practices; •Stimulate the creation of networks of local schools that promote education for sustainable development;
Description (methodology)	The Network is divided into Committee management, composed of the headmasters from the schools about the Rete and the operational Group, composed of the Referents of each school about the Rete; they will meet periodically to agree on activities. PLANNED ACTIVITIES FOR THE 2024-2025 Academic Year 1. Implementation of the Network with the invitation to join the new winning schools of the MIUR ASVIS Competition “Let's do 17 Goals: transform our world.” 2. Designing new experimental and action research initiatives in collaboration with universities and territorial entities. *ACTIVITIES CARRIED OUT* People: End poverty and hunger and ensure that every human being may realize their potential in a healthy environment. Planet: Protect the planet from degradation through consumption and production awareness, sustainably managing its natural resources. It may satisfy the needs of the present and future generations. Prosperity: To ensure that every human being may enjoy life prosperously and satisfactorily and that progress occurs in harmony with nature. Peace: Promote social peace, equity and inclusion Partnership: Mobilise the necessary means to implement this Agenda through a Global Collaboration for Sustainable development.
Conditions for success	The goals of the Rete Agreement are achieved when there is active cohesion, sharing, and participation by the entities in charge of the training and refresher, as well as management and coordination meetings of the activity for which the project is constituted.
GreenComp competencies addressed	Acting for sustainability
Required assets	ANNUAL PARTICIPATION FEE OF EURO 150
Links \ Contact References	Tiziana Faggiano retenazionale.scuolagenda2030@gmail.com https://retescuolaagenda2030.wordpress.com

Name	**ECO-SCHOOLS (GREEN FLAG)**
Duration \ Period (year)	2023-2027 (school years)
Provider	The FEE Foundation for Environmental Education Environmental) is an international non-governmental and non-profit organisation based in Denmark. Founded in 1981, it is present in 77 countries worldwide on five continents. The principal goal of the FEE programs is to

	disseminate good environmental practices. The Authority manages the program at the national level: Blue Flag, Eco-Schools, Green Key, Spighe Verdi, Young Reporters for the Environment and Learning about Forests.
Target group(s)	*Community school: teachers, students, ATA staff, parents*
Main aims	The Eco-Schools Program It is an international program dedicated to schools for environmental education, management and certification. The initiative also proposes the methodological approach of Agenda 21 in schools, encouraging cooperative interaction and responsible participation of the various subjects. The schools involved see their commitment rewarded with possible certification. The suggested methodology takes up, in various points, the aforementioned certification path based on the principles of EMAS II. Eco-Schools is not a project but a PROGRAM Eco-Schools: 4 Areas Themes main : Water , Energy , Waste , Biodiversity
Description (methodology)	The method of the 7 STEPS 1. The Eco-Committee 2. The Environmental Investigation 3. The Action Plan 4. Monitoring and Evaluation of Environmental Performance 5. Information, Communication and Involvement 6. Curricular Integration 7. The Eco-Code The first step of the Eco-Schools program involves the creation of an Eco-Committee within the school to structure the program phases. Inside, a president and secretary are appointed as the program's headmaster and referent. In this way, it becomes an operational institutional organ of the school. Then, a regulation must be drawn up specifying the purposes, functions, and responsibilities. During the meetings convened for the performance of each step of the program, the secretary has the task of drafting and disseminating the report to all members of the Committee.
Conditions for success of the practice	Implementing *The Eco-Schools* program is necessary in convincing that, starting from institute schools, where the users fall into an age range particularly prone to change , is possible to reach the goals put into practice from the ecological actions in view of obtaining a healthy and sustainable future.
GreenComp competencies addressed	Area 3 - vision of sustainable futures
Required assets	*Which assets (resources) are necessary for replicating or adapting the practice?* Which resources I am necessary to replicate or adapt the practice?
Links \ Contact References	Provide a link to the study site, if any. Provide the contact details of the organisation and/or the person who carried out the internship. Provide a list of references related to the practice (manuals, lines guide, publications, web pages, etc.).

Name	**“European Week for the reduction of the waste” (SEER)**
Duration \ Period (year)	The European Union Week for the Reduction of Waste was launched for the first time in 2009, thanks to a pilot project co-financed by the *European Commission* to address the problem of a more serious issue of our time: excessive waste production.
Provider	Local entities, schools, NGOs, businesses
Target group(s)	This is an awareness campaign on relative prevention of waste in Europe, which every year involves public entities, businesses, associations, schools and individual citizens in actions aimed at reducing our footprint on the Planet, with the invitation to participate by registering our own action.

Main aims	A short description of the main goals and objectives The XVI edition from the European Reduction Week of the Waste (SERR 2024) is focused on the reduction of the waste to feed in the EU: current challenges and future objectives. From 2nd September to 6th November 2024, citizens, businesses, associations, public administrations and schools will be able to register their own actions to be taken between November 16 and 24, 2024. Goals: Reduce waste: Use fewer resources and produce less waste. Reuse of products: recovery and reuse of products or their parts, which includes both preparations to reuse and actual reuse. Recycling materials: includes all recovery operations that occur following collection and through which waste materials are transformed into new products.
Description (methodology)	To get started, you need to think of an initiative that can contribute to reducing waste food. For example, organise an awareness campaign or an educational workshop. Once you have planned the action, simply register on the official SERR website by the deadline, providing details about the initiative you intend to carry out. In addition, it is essential to spread the message by involving other people and organising meeting events or discussing the topic.
Conditions for success	Cohesion between The entities involved in the program, from the anti-waste week feed, share and ecological initiatives, for example, starts with an investigation to feed in the contexts municipalities (families, schools, social centres) to have feedback and intervene on critical points emerged.
GreenComp competencies addressed	Area 1 - Incorporate sustainability values
Required assets Links \ Contact References	https://ewwr.eu/take-part/ https://ewwr.eu/take-part/#how-to-participate

Name	**MICROPLASTIC HUNTERS PROJECT**
Duration \ Period (year)	2021 - Ongoing
Provider	It is an international Project on the detection and monitoring of microplastics in the environment promoted by the GLOBE association, which occupies the climate changes and, for a year now, has been dealing with the problem of microplastics in collaboration with Deakin University in Geelong Victoria in Australia. After the theoretical training phase, the teachers will introduce the methodology research to the students, following the actual monitoring phase from the superficial waters present in the territories from the schools with the collection and transmission of the data to the Australian researchers. The detection and monitoring will be addressed to the sea waters.
Target group(s)	The project, implemented in the Chemistry addressed (third classes), wants to be extended to the two years (second classes) of the other courses of the Institute (Tourism, AFM and SIA) given the transversality of the same project and the multidisciplinary character.
Main aims	The aim is to create a global database on an emerging environmental problem of gravity, diffusion and complexity: the presence of microplastics in the water (ditches, streams, rivers, canals, lakes, ponds, seas). Microplastics are a well-known environmental problem that affects all spheres of the Earth. Promote science education through the use of scientific methods that are carried out through hands-on activities. Promote the production of environmental knowledge on the ecosystem.

Description (methodology)	Phases: Sea water sampling Filtration and recognition by microscope in the laboratory of the Institute Recording data on digital forms
Conditions for success of the practice	Collaboration with international institutions of research is a condition for success, as in this case, since, like this proceeding, it happens an implementation of the actions for which the Project is constituted and, above all, a valid and useful comparison of the processing and evaluation methods of the data results, as well as from the typology of the interventions to be carried out to prevent continuity from the negative results.
GreenComp competencies addressed	Embracing Complexity in Sustainability Expected skills (to be developed): knowing how to design and implement study paths, participating in international scientific research suitable for the age of the students, and building monitoring campaigns with the use of digital tools.
Required assets	
Links \ Contact References	https://www.globeitalia.it/ https://www.globeitalia.it/micropla-sc-art/il-progetto/135-micropla-sc-art-2025.html

Name	**AWARENESS CAMPAIGN ON THE 4 R'S ISSUES: WASTE REDUCTION, REUSE, RECYCLING**
Duration \ Period (year)	2024 - ongoing
Provider	Provincial of Latina - Sector Ecology and Land Protection Campaign created with funds from the Lazio Region
Target group(s)	Students schools involved in the project
Main aims	The project aims to raise the guys' awareness of the main environmental themes, orienting the singles' behaviours towards attitudes that are respectful of man and the environment. In particular, they are faced with themes such as the prevention of waste and the collection of differentiated waste.
Description (methodology)	The project is carried out on two tracks connected between them: A training and presentation phase of the problem, implemented through the preparation of a website and specialised marketing activities (video, banners); A practical study offers students the opportunity to visit selected companies operating in the area that deal with waste management and energy production. This phase requires the active participation of the Institute, which must schedule a field trip day in the 2024/2025 school year. This second phase allows students to get to know the practical methods of waste treatment first-hand.
Conditions for success	The public administration's promotion of support and assistance activities for the environment is now a consolidated procedure, especially if the entity vector of the action is the same as that of the school, even in this case. The success dictated by the achievement of the goals pre-established is strongly determined by the synergy between the parties in the conduction and in the Project management, in the made available places and of the spaces used for the ecological actions, to keep participation alive from the new generations to the improvement operations from the sustainability environmental.
GreenComp competencies addressed	Incorporate sustainability values
Required assets	--
Links \ Contact References	**Project portal:** https://www.provincialatina4r.it/ https://www.provincia.latina.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/14879

	Join the project: a.furbatto@provincia.latina.it

ROMANIA

Name	"Școala din Pădure Pădurea Crivina" – Forest School
Type and context	Project The educational program focused on outdoor learning in a forest setting, emphasising environmental education and experiential learning. It also incorporated aspects of green education and green skills development.
Duration \Period (year)	Local – The project occurs within the Crivina Forest, near local communities, but its principles could be applied more broadly within Romania and beyond.
Provider	Ongoing, started in recent years (exact year not specified)
Target group(s)	Local educators, environmental organizations, and possibly governmental bodies promoting environmental education.
Main aims	Primary and secondary school students, teachers, VET students, local community members, and environmental professionals.
Description (methodology)	• To promote environmental education and awareness through direct experience in nature • To teach sustainability, ecological principles, and green skills through practical activities in a forest setting • To foster critical competencies in teamwork, leadership, problem-solving, and critical thinking for sustainable development • To integrate green learning approaches and sustainable practices into vocational education and training (VET)
Conditions for success	1. Outdoor Learning: Lessons are taught directly in the forest, focusing on ecology, biodiversity, conservation, and sustainable practices, which align with green learning objectives. 2. Interdisciplinary Approach: Subjects like biology, geography, and environmental education are integrated, with a focus on green education principles and sustainability across disciplines. 3. Hands-on Activities: Activities like tree planting, species identification, and ecosystem observation are part of the curriculum, allowing VET students to engage in real-world sustainability projects. 4. Collaboration with VET Experts: VET students from environmental science, green technology, and sustainable development fields work on practical projects such as designing eco-friendly solutions or studying forest ecosystems. 5. Reflection and Action: Students reflect on their learning and participate in conservation projects, applying GreenComp competencies such as Action Competence and Systems Thinking.
GreenComp competencies addressed	Internal: Availability of trained educators, access to forested areas, suitable teaching materials for outdoor learning, integration with VET curricula focused on green skills and green technology. External: Collaboration with VET institutions, environmental organizations, support from local authorities, and institutional backing for green education initiatives.
Required assets	• Valuing Nature – Understanding the importance of nature conservation through direct engagement with ecosystems. • Sustainability Awareness – Gaining insights into the interconnection of ecological systems and sustainable practices. • Systems Thinking – Analyzing the relationships and dynamics within ecosystems and human activities in the environment. • Action Competence – Developing the skills to take informed, responsible action in environmental conservation and green technology projects.
Link \ Contact References	• Access to forested land for practical learning and field activities

	• Educational kits and materials on environmental topics, green technology, and sustainability • Collaboration with VET experts to integrate sustainability projects into the curriculum • Partnerships with local environmental NGOs and green industry professionals for guidance and resources • Integration of vocational training modules related to green skills, renewable energy, sustainable design, and ecological conservation.

Name	**Green Week (Săptămâna Verde) Romania**
Type and context	Project- National scope This practice falls under the category of a national project with educational activities, workshops, and community events. It involves a series of coordinated efforts to foster environmental consciousness among school students. The program integrates formal (curricular) and non-formal educational strategies to ensure comprehensive learning experiences. Scope: The scope of this practice is national, as it is implemented across Romania, targeting schools and educational institutions throughout the country. It involves the participation of multiple stakeholders, including local schools, municipal authorities, environmental NGOs, and national education bodies, ensuring broad coverage and consistent implementation across regions. It also has potential applications in Vocational Education and Training (VET) contexts, particularly for students pursuing careers in environmental sciences, green technology, and sustainable development. Several schools with VET curricula incorporate green practices, such as the technological high schools that connect VET with green teaching, learning and best practices around GreenComp.
Duration \Period (year)	Launched in 2022, annual programme
Provider	Ministry of Education, Romania
Target group(s)	Primary, secondary and high school students, teachers, educational institutions, VET experts and centres, community
Main aims	To promote environmental education and awareness among students To encourage sustainable practices and ecological responsibility To integrate green education within the national curriculum To support the development of sustainability competencies in VET students
Description (methodology)	Schools participate in a dedicated Green Week annually. Activities include environmental workshops, field trips to natural parks, recycling projects, and guest lectures on sustainability. Collaboration with environmental NGOs and local authorities for specialized sessions. VET students engage in practical sustainability projects, such as designing green technology prototypes, eco-friendly community projects, and internships with environmental organizations. Students engage in hands-on activities like tree planting and waste audits. Reflection sessions and reports post-event to evaluate the learning outcomes, with VET-specific assessments aligned with GreenComp competencies.
Conditions for success	Internal: Active involvement of teachers, availability of learning resources, effective planning and scheduling External: Institutional support from the Ministry of Education, partnerships with NGOs, funding for educational materials and transportation
GreenComp competencies addressed	Valuing Nature Sustainability Awareness Systems Thinking

	Action Competence
Required assets	Educational kits and materials on environmental topics Access to green spaces for outdoor activities Collaboration with local environmental experts Integration with VET frameworks focusing on green technology and sustainable practices
Link \ Contact References	Ministry of Education: https://www.edu.ro Contact: Str. General Berthelot 28-30, București, România References: National Guidelines on Environmental Education, Romanian Curriculum Framework, GreenComp Framework by the European Commission

Name	**"Green Hive Project"**
Type and context	Project, Erasmus+ co-funded initiative
Duration \Period (year)	National (Romania), Regional (EU) Started in 2022, ongoing
Provider	Erasmus+ Programme, Green Hive Network
Target group(s)	Vocational Education and Training (VET) learners, educators, businesses, and civil society organizations
Main aims	Enhance sustainability education in VET. Foster green innovation and collaboration between VET providers, businesses, and communities. Promote the integration of green skills into vocational curricula.
Description (methodology)	The project establishes "Green Combs" (local sustainability hubs) within VET institutions. Encourages collaboration between VET providers, businesses, and local stakeholders to promote green innovation. Facilitates sustainability-related workshops, training, and eco-initiatives. Develop curriculum and resources to embed green skills within VET programs. Provides a platform for knowledge exchange and best practices.
Conditions for success	Internal: Commitment from VET institutions to integrate sustainability into curricula, trainers, and resource availability. External: Institutional support from the Erasmus+ Programme, collaboration with local businesses and community organizations, funding and policy alignment for green education.
GreenComp competencies addressed	- Sustainability Awareness - Systems Thinking - Action Competence - Valuing Nature - Green Economy
Required assets	Green infrastructure (e.g., eco-friendly spaces for learning and innovation) Educational materials on sustainability topics Partnerships with local and regional businesses, NGOs, and governmental bodies Integration with existing VET frameworks and curricula
Link \ Contact References	Green Hive Project Website Contact: info@greenhiveproject.eu Erasmus+ Programme official website: https://ec.europa.eu/programmes/erasmus-plus

Name	**Bucovina Forestry College**
Type and Context	Vocational Education and Training (VET) Institution
Duration/	Ongoing

Period	
Provider	Ministry of Education & Local Forestry Institutions
Target Group(s)	VET students, forestry professionals, local community members
Main Aims	- Provide specialized education in sustainable forestry management. - Train students in conservation techniques and responsible land use. - Promote biodiversity protection and eco-friendly resource management.
Description (Methodology)	- Hands-on forestry training combined with theoretical instruction. - Collaboration with forestry organizations for real-world application. - Workshops on renewable resource management and conservation strategies.
Conditions for Success	- Strong partnerships with forestry experts and environmental agencies. - Availability of well-equipped training facilities and forested learning areas. - Integration of sustainability principles within the national VET curriculum.
GreenComp Competencies Addressed	- Sustainability Awareness - Systems Thinking - Action Competence
Required Assets	- Well-maintained forests for practical learning - Modern forestry tools and equipment - Experienced trainers in sustainable forestry management
Contact/ References	Collaboration with forestry organizations, Ministry of Education, and EU-funded sustainability projects

Name	**RenewAcad Program**
Type and Context	Vocational retraining program for transitioning workers into renewable energy sectors.
Duration/ Period	Ongoing
Provider	Ministry of Labor, Renewable Energy Industry Partners, European Social Fund
Target Group(s)	Former coal industry workers, unemployed professionals seeking careers in renewable energy
Main Aims	- Retrain workers from fossil fuel industries for green energy jobs. - Address labor market transitions to a sustainable economy. - Support economic resilience in coal-dependent regions.
Description (Methodology)	- Technical courses on solar, wind, and hydro energy installations. - Hands-on training with renewable energy companies. - Certifications for employability in green energy industries.
Conditions for Success	- Strong partnerships with renewable energy companies. - Government and EU financial support. - High-quality trainers in renewable energy fields.
GreenComp Competencies Addressed	- Sustainability Awareness - Action Competence - Green Economy Transition
Required Assets	- Modern training facilities equipped for renewable energy practicals. - Government incentives for industry collaboration. - Access to employment opportunities in renewable energy.
Contact/ References	Collaboration with energy companies, Ministry of Labor, European Social Fund programs

TURKEY

Name	TEMA Lise - TEMA Highschool
Type and context	Educational program / Environmental education initiative National (Turkey)
Duration \Period (year)	The program has been active for several years. Since 2014, the High School TEMA Education Program, implemented in cooperation with the Ministry of National Education, has been carried out by volunteer teachers. In 2018, the content and scope of the High School TEMA Education Program was completely renewed.
Provider	TEMA Foundation (Turkey)
Target group(s)	High school students across Turkey
Main aims	The main goal is to raise awareness about environmental issues, promote sustainable practices, and empower students to become active advocates for nature conservation. The program focuses on environmental education, climate change awareness, and the importance of biodiversity and ecosystem preservation.
Description (methodology)	**Program Introduction:** TEMA introduces environmental topics relevant to high school students, such as climate change, biodiversity, and sustainable development. **Workshops and Seminars:** Conducting interactive workshops, seminars, and outdoor activities to engage students with hands-on experiences related to nature conservation. **Project-Based Learning:** Students are encouraged to work on projects related to environmental protection, such as creating awareness campaigns or organizing local tree planting events. **Collaboration with Schools:** TEMA collaborates with schools across Turkey to implement the program, supporting teachers with resources and materials for environmental education. **Student Engagement:** The program often involves students directly in actions like tree planting, waste management initiatives, or community outreach.
Conditions for success	**Essential internal conditions (classroom elements, systems, tools):** Active student participation and teacher support Availability of educational materials (brochures, activity guides, etc.) Strong communication between TEMA and participating schools **Essential external conditions (institutional, economic, social):** Government and local authority support for environmental education Societal interest in sustainability issues Financial resources for program implementation
GreenComp competencies addressed	**Environmental Responsibility:** Understanding environmental issues and their global impact. **Sustainable Practices:** Promoting eco-friendly actions like recycling, conservation, and sustainable consumption. **Critical Thinking in Environmental Contexts:** Analyzing environmental problems and evaluating potential solutions.
Required assets	Educational materials (booklets, guides) Trained facilitators or educators Strong network of participating schools and local stakeholders Funding or sponsorship for organizing events and activities
Link \ Contact References	**TEMA Official Site:** https://www.tema.org.tr/calismalarimiz/egitim/doga-egitim-programlari/lise-tema **Contact Information:** **TEMA Foundation:** info@tema.org.tr **Phone:** +90 212 213 17 60

Name	Yuva Association SMALEI Project Digital Academy
Type and context	**Category:** Project **Scope:** National (focused on Turkey)
Duration \Period (year)	The project began in 2022.
Provider	The project is initiated and managed by **Yuva Derneği (Yuva Association)**.
Target group(s)	The beneficiaries of the project are **youths and young adults** in Turkey, primarily from underserved communities, with an emphasis on providing access to digital skills and green technologies.
Main aims	The main goal of the project is to empower underserved youth through digital skills training, with a specific focus on **green technology**. The aim is to equip young people with the competencies necessary to meet the demands of the green economy.
Description (methodology)	**Training:** The practice provides hands-on, experiential learning in green technologies and digital skills. **Workshops & Courses:** Structured courses and workshops are organized as part of the project. **Digital Academy:** Participants are engaged through the **Digital Academy**, a platform where they can learn about environmentally sustainable practices in technology, digital tools, and other relevant green competencies. **GreenTech Focus:** Topics covered include climate change solutions, renewable energy, sustainable development, and circular economy principles. **Step-by-step Approach:** The training process is divided into different stages, from introductory learning to more advanced, specialized topics.
Conditions for success	**Internal Factors:** Availability of trained facilitators and experts in the field of green technology. Access to relevant digital tools and platforms for online training. A well-structured curriculum tailored to the needs of the youth. **External Factors:** Institutional support and collaboration with relevant stakeholders (e.g., local governments, tech companies, etc.). Economic support, possibly through grants, donations, or partnerships to sustain the project. A societal shift towards embracing sustainable practices and digital skills as necessary components of future jobs.
GreenComp competencies addressed	The project addresses multiple competencies within the **GreenComp** framework, including: **Climate Change Mitigation:** Knowledge of solutions that help reduce environmental impact. **Sustainable Innovation:** Development of new, environmentally friendly technologies and practices. **Circular Economy:** Understanding of the need for sustainable resource management and waste reduction. **Digital Skills for GreenTech:** Using digital tools to analyze and solve environmental problems.
Required assets	**Digital Platforms:** Necessary tools for online learning, communication, and assessment. **Trained Personnel:** Experts in green technologies and digital education.

	Resources for Sustainability: Financial and institutional support to keep the project running and growing. **Partnerships:** Collaboration with industry players, local authorities, and international organizations for knowledge sharing and resource pooling.
Link \ Contact References	**Website:** https://www.yuva.org.tr **Contact Info:** Email: info@yuva.org.tr Phone: +90 312 441 72 00 Address: Yuva Derneği, **Ankara, Turkey**

Name	**Teacher Training from Prof Dr Levent Kurnaz**
Type and context	This practice falls under seminar and training course. The scope of this practice is national within Turkey.
Duration \Period (year)	It started in 2023 and is ongoing.
Provider	The seminars were organized by various educational institutions in Turkey, with notable contributions from Levent Kurnaz and others.
Target group(s)	The beneficiaries of this practice are teachers, specifically educators involved in sustainability, climate change education, and environmental awareness in schools.
Main aims	The main goals and objectives of these seminars and courses are to increase awareness among teachers about climate change, its impact, and solutions. It aims to equip educators with the knowledge and tools to effectively teach students about environmental sustainability and climate action.
Description (methodology)	**Introduction and Awareness Raising** The seminar begins with an overview of **climate change**, its **global impact**, and the role of education in mitigating its effects. **Interactive Training Sessions** Teachers engage in workshops and discussions focused on **sustainable practices** and the **integration of climate change topics** into the school curriculum. **Practical Application** Teachers are encouraged to create lesson plans, conduct field studies, and implement activities that demonstrate **eco-friendly practices**. **Long-term Integration** A focus is placed on embedding sustainability into **long-term educational practices**. Teachers learn how to incorporate climate change topics into different subject areas.
Conditions for success	**Internal conditions**: Engagement from teachers, access to resources such as teaching materials, and proper institutional support are essential. **External conditions**: Institutional backing, collaboration with environmental organizations, and societal interest in addressing climate change are critical to the success of the practice. **Tools**: **Multimedia** tools, **interactive platforms**, and **curriculum guides** focused on sustainability are key resources.
GreenComp competencies addressed	The project addresses multiple competencies within the **GreenComp** framework, including: **Sustainability Literacy**: Understanding the environmental, social, and economic aspects of climate change. **Critical Thinking**: Developing the ability to evaluate information and advocate for climate action. **Problem-Solving**: Applying knowledge to real-world challenges, specifically in relation to environmental sustainability.

	Digital Skills for GreenTech: Using digital tools to analyze and solve environmental problems.
Required assets	**Training materials** and **curriculum guides** on climate change and sustainability. **Digital tools** for creating interactive lessons (e.g., PowerPoint, digital classrooms). **Access to experts** and **local resources** for field trips or practical activities.
Link \ Contact References	**Van Provincial Directorate of National Education**: https://van.meb.gov.tr/www/ogretmenlere-yonelik-iklim-degisikligi-semineri-duzenlendi/icerik/1224

Name	**Environment and Zero Waste Seminar for Teachers**
Type and context	Seminar National
Duration \Period (year)	The first term- month of the education year
Provider	Ministry of National Education
Target group(s)	All teachers who is to integrate zero waste principles into their curriculum.
Main aims	This seminar is designed to empower educators and professionals with the necessary knowledge and tools to integrate zero waste principles into their fields while fostering a culture of sustainability and responsibility.
Description (methodology)	The seminar covers 3 videos addressed to teachers. First one lasts 16 minutes and covers the topics of waste and kinds of waste, the philosophy of zero waste, zero waste management. Understanding the concept of zero waste and its importance in environmental sustainability. Identifying different types of waste and learning waste prevention strategies. Second video lasts 16 minutes and covers the topics of how to recycle waste, basic sources of waste. Third video is 7 minutes long and covers 'Zero waste game'. The viewer has 2 months to watch the full seminar when available. 80% completion is necessary to be approved successful.
Conditions for success of the practice	1. User-Friendly Digital Platform (ÖBA, Zoom, Moodle) with easy access to resources. 2. Practical & Engaging Content – Real-life examples, case studies, and project-based learning activities. 3. Institutional Support – Backing from schools, ministries, and educational bodies to encourage participation. 4. Recognition & Incentives – Certificates, professional development credits for teachers.

GreenComp competencies addressed	1. Valuing sustainability and supporting fairness 2. Embracing complexity in sustainability, understanding the lifecycle of waste and interconnected environmental impacts, evaluating potential solutions 3. Envisioning sustainable futures with zero waste 4. Adaptability and resilience, learning to adopt sustainable habits and respond to environmental challenges. 5. Acting for sustainability, encouraging mindful consumption and waste reduction 6. Collective action & personal responsibility, empowering individuals and groups to implement zero waste practices in schools and communities.
Required assets	1. Digital and technological resources: online learning platform ÖBA 2. Presentation tools (PowerPoint, Canva, or Google Slides for engaging visuals) 3. Pre-recorded videos 4. Structured curriculum and lesson plans, Virtual simulations 5. Expert speakers, support from schools, universities NGOs 6. Post-seminar quizzes, surveys, and certificates of participation
Link \ Contact References	https://www.oba.gov.tr/egitim/detay/cevre-ve-sifir-atik-semineri-adaylik-12-mayis-2022-den-sonra-goreve-baslayan-aday-ogretmenlerimiz-icindir-956

Name	**Eko Okullar (Eco-Schools Program)**
Type and context	**Category:** Project **Scope:** International
Duration \Period (year)	1995 – Ongoing
Provider	**Author/Creator:** Foundation for Environmental Education (FEE) **National Coordinator in Turkey:** TÜRÇEV (Türkiye Çevre Eğitim Vakfı – Turkey Foundation for Environmental Education)
Target group(s)	**Beneficiaries:** Kindergarten, primary, and secondary school students Teachers and school staff Parents and local communities
Main aims	The Eco-Schools program aims to raise awareness among students about environmental issues and promote sustainable practices in schools and daily life. Its primary objectives include: Encouraging environmental responsibility Developing sustainable habits and eco-friendly attitudes Involving students in decision-making processes related to the environment
Description (methodology)	**Establishing an Eco-Team:** Schools form a team consisting of students, teachers, parents, and other stakeholders. **Environmental Review:** The team conducts an assessment of the school's environmental impact. **Action Plan:** Based on the review, an action plan is prepared to address environmental issues. **Monitoring and Evaluation:** Progress is monitored, and necessary adjustments are made to meet the objectives.

	Curriculum Integration: Environmental education is integrated into the school's curriculum. **Involvement and Awareness:** Students actively participate in projects and activities to raise awareness in the school and the community. **Eco-Code:** Schools create an "Eco-Code" to represent their environmental commitments.
Conditions for success of the practice	**Internal Conditions:** Strong support from school management and staff Active involvement of students and teachers Integration of environmental education into the curriculum **External Conditions:** Support from local authorities and communities Availability of funding and resources for environmental projects Partnerships with environmental organizations
GreenComp competencies addressed	Environmental awareness and responsibility Critical thinking and problem-solving related to sustainability Collaboration for sustainable development Active participation in promoting environmental change
Required assets	Training materials for teachers and students Monitoring and evaluation tools Financial resources for implementing projects Community partnerships and support
Link \ Contact References	**Website:** https://www.ekookullar.org.tr/ **Contact:** Türkiye Çevre Eğitim Vakfı (TÜRÇEV) Email: info@turcev.org.tr Phone: +90 (312) 491 18 22

Name	**Ministry of National Education: Sustainable Development and Climate Change Seminar**
Type and context	Training Seminar National
Duration \Period (year)	Implemented: 2023
Provider	Ministry of National Education
Target group(s)	School administrators and teachers.
Main aims	● Raise awareness about sustainable development goals and climate change. ● Equip educators with the knowledge and skills to promote sustainability in schools. ● Encourage schools to implement sustainable practices and engage students in climate action..

Description (methodology)	1.Introduction: Explanation of the Sustainable Development Goals (SDGs) and their relevance to education. 2.Focus on Climate Change: Overview of climate change causes, effects, and solutions. 3.Interactive Sessions: Case studies, group discussions, and best practice sharing on school sustainability initiatives. 4. Action Planning: Development of strategies and action plans for implementing sustainability in schools.
Conditions for success of the practice	**Internal:** Active participation of educators Practical tools and resources for schools Supportive school environment for applying new practices **External:** Institutional support from MEB Adequate funding and resources.
GreenComp competencies addressed	● Critical thinking and systemic understanding of sustainability and environmental issues ● Personal responsibility for promoting sustainable practices in schools ● Collaboration for sustainable solutions within educational settings.
Required assets	● Training materials on sustainable development and climate change ● Access to digital resources and case studies ● Support networks for ongoing collaboration and knowledge exchange
Link \ Contact References	Sürdürülebilir Kalkınma Hedefleri ve İklim Değişikliği Semineri https://www.oba.gov.tr/egitim/detay/surdurulebilir-kalkinma-hedefleri-ve-iklim-degisikligi-semineri-665 MEB Okullarda Sürdürülebilirlik Eğitim Semineri https://ogm.meb.gov.tr/www/okul-yoneticileri-ve-ogretmenlere-yonelik-egitim-semineri-okullarda-surdurulebilirlik/icerik/1692 **Contact:** Ministry of National Education (MEB) – Directorate General for Teacher Training and Development

Name	**MEB Eco-Friendly 1000 Schools Project**
Type and context	Project National
Duration \Period (year)	Implemented: 2022
Provider	Ministry of National Education (MoNE), Turkey
Target group(s)	Primary and secondary schools across Turkey, including students and teachers.
Main aims	● To promote the concept of eco-friendly schools ● To raise environmentally conscious individuals ● To support sustainable development goals ● To create awareness about energy efficiency and recycling

Description (methodology)	1.Introduction of the project and selection of participating schools 2.Infrastructure improvements in schools focused on energy efficiency, recycling, and water conservation 3.Training programs for teachers and students on eco-friendly practices 4.Implementation of innovative solutions such as solar panels and rainwater harvesting systems 5. Monitoring and evaluation processes, followed by reporting outcomes.
Conditions for success of the practice	**Internal Conditions:** • Support from school management and teachers • Preparation of educational materials • Motivation of students regarding environmental awareness **External Conditions:** • Support from the Ministry of National Education (MoNE) • Contributions from local governments and NGOs • Financial sustainability of the resources.
GreenComp competencies addressed	• Awareness of sustainability • Resource management and energy efficiency skills • Social responsibility and environmental stewardship.
Required assets	• Educational materials and content • Eco-friendly infrastructure systems (solar panels, rainwater harvesting systems, etc.) • Expert trainers and guidance support
Link \ Contact References	**Project Website:** https://www.meb.gov.tr/cevre-dostu-1000-okul-projesi-basladi/haber/25695/tr **More Information:** https://istanbul.meb.gov.tr/meb_iys_dosyalar/2022_09/07143342_doYa_dostu_okul_dergisi.pdf