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GROWS – Moving towards a Green tRansitiOn through sustainable Waste management education in the VET Sector

WP2: Toolkit on developing a Green Strategy in VET

Transnational Report

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Abstract

This Transnational Report is a result of an overview of the national reports completed as part of the GROWS project within the partner countries involved. Specifically, it dives into sustainable waste management practices across Poland, Cyprus, Greece, Bulgaria, Portugal, and Italy, focusing on strategies within the Vocational Education and Training (VET) sector. To better frame the picture of what is happening in the involved partner countries, all partners have completed an extensive research through the regulations and current state of the art on green education and waste management education, followed by interviews from VET providers, as well as a questionnaire sent to educators as well as learners as for attracting information from the ground and identify where the scope of the project needs to focus on.

For each country's profile, a quick overview was made based on population, economies of scale and unique characteristics. Poland's diverse economy is heavily reliant on industry, agriculture, and the burgeoning services sector, underscoring the importance of environmental education and waste management practices. Cyprus is mostly relied on a mix of tourism, agriculture, and services. The main environmental challenges the country faces are urbanisation, tourism-related waste, and limited landfill space. In Portugal, VET programs play a vital role in fostering inclusivity and lifelong learning, aiming to enhance employability and address educational challenges. Italy grapples with climate change vulnerabilities, while Greece faces environmental pressures shaped by its tourism-dependent economy. Bulgaria, strategically positioned in Southeastern Europe, emphasises both formal and non-formal education avenues to equip learners with skills for environmental stewardship. Together, these nations demonstrate varying approaches and challenges in their pursuit of sustainable waste management within the VET sector.

1. Setting the scene - Desk Research

1.1 Introduction

Through desk research, all partners analysed a National State-of-the-Art Report on sustainable waste management with a special focus on strategies to achieve a green transition in the VET sector. Sources utilised were reliable and relevant, with data collected within recent years. Older data may also be used to compare with more recent information, to show the evolution of concepts, or to indicate quantifiable projections.

The report started from creating a general country's profile, general context and for each of the six partner countries involved in the project and participation in formal education, non-formal education and training and informal learning. Starting from Poland, ecological education has a long history, dating back to the establishment of the Educational and Didactic Centre in the Ojcow National Park in 1991. Despite the existence of numerous institutions and legal frameworks aimed at environmental protection, such as the Ministry of Climate and Environment and the Waste Management Act, there are still challenges in implementing effective environmental education. The lack of updates to the National Strategy for Environmental Education since 2001 and the limited focus on environmental topics in school curricula highlight areas for improvement. Similarly, Portugal emphasises environmental literacy through initiatives like the Core Competencies for Environmental Education for Sustainability and programs like Eco-Schools and Young Reporters for the Environment. Italy has made strides in integrating environmental education into its curriculum, including making climate change education mandatory in schools since 2019. The National Program for Environmental Education, Information, and Training aims to distribute environmental education programs nationwide. Greece and Cyprus also prioritise green education, focusing on awareness-raising, teacher training, and collaboration with various stakeholders. Despite these efforts, there is still room for improvement, particularly in ensuring consistency across educational levels, providing up-to-date resources, and fostering community engagement. Bulgaria, through its National Waste Management Plan and Strategic Framework for the Development of Education, Training, and Learning, seeks to integrate environmental education into its vocational education system, preparing students for the green economy and sustainable development. Overall, these countries recognize the importance of environmental education in addressing current and future environmental challenges and are taking steps to enhance their educational systems accordingly.

1.2 Current Strategies on Green Education

An overview of the key directives and policies such as the European Skills Agenda, Education for Sustainable Development Framework for 2030, etc., each country elaborated a critical review of current strategies and policies on environmental education. While progress has been made in each country, challenges such as outdated strategies, lack of awareness, and enforcement issues persist.

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Poland has long recognised the importance of environmental care and ecological education. Institutions such as the Ministry of Climate and Environment and the National Fund for Environmental Protection and Water Management promoted relevant activities and strategies. Despite comprehensive legislation, environmental education still faces challenges, with outdated strategies and a lack of awareness among educators. The country has implemented a Uniform Waste Segregation System since 2017, making it mandatory to separate municipal waste, although enforcement lacks penalties. The National Fund for Environmental Protection and Water Management runs programs aimed at disseminating knowledge on climate, environmental protection, and sustainable development. However, there's a need for updated strategies, as the National Strategy for Environmental Education remains unchanged since 2001. A 2023 study revealed teachers' lack of awareness regarding the differences between environmental education and education for sustainable development. While Poland adheres to EU directives, effective implementation requires multifaceted action and evaluation at various levels.

Greece is prioritising green education for sustainable development, focusing on environmental awareness, integration across educational levels, and teacher training, while collaborating with institutions, NGOs, and foreign partners. Their strategy aligns with international frameworks like the European Skills Agenda and the Education for Sustainable Development (ESD) Framework for 2030, aiming to develop green skills and competencies for a sustainable economy. To achieve Sustainable Development Goal 4.4, Greece is implementing a Reformed Training Model and Umbrella VET Programme, upskilling or reskilling 78,000 unemployed individuals in digital and green skills. Policy changes are being enacted to address social challenges holistically, ensuring no one is left behind. However, there are areas for improvement in Greece's green education strategy, such as ensuring consistency in environmental themes across educational levels, providing teachers with updated resources and training, emphasising practical application, fostering community engagement, and expanding focus on climate change education. Addressing these areas will further advance Greece's efforts in green education, contributing to a more sustainable future.

Cyprus faces significant environmental challenges, including the protection and management of water resources, health, quality of life, nature, biodiversity, waste management, and air pollution. Climate change-induced droughts impact water supply, while the country experiences one of the EU's highest waste generation rates, posing environmental, health, and socioeconomic risks. The reduction of waste generation is a priority, with per capita waste reaching 683 kg/year. In terms of environmental education, the HRD Authority Department emphasises the importance of acquiring and upgrading knowledge and skills in green occupations to transition to a greener economy. Identified green skills include new technologies, environmental legislation, and specialised skills like project management and strategic planning. Adaptation of existing skills to meet green economy demands is crucial for sustainable development.

Several strategies, both at the national and European levels, have been developed to implement environmental education**. Italy's** National Strategy for the Circular Economy and National Waste Management Programme, outlined in the National Recovery and Resilience Plan (NRRP), set targets for skills development in circular economy issues and increasing environmental awareness. The ReGeneration School initiative by the Ministry of Education aims to support schools in transitioning to sustainable development education, although there's room for improvement in systemic change. The EU Commission has also emphasised the importance of developing sustainability skills through education and training, recommending investments in learning for environmental sustainability.

Portugal has successfully integrated environmental education into its educational system, fostering environmentally literate citizens capable of addressing 21st-century environmental challenges. The Directorate-General for Education (DGE) collaborates with public organisations, institutions, and civil society partners to develop benchmarks for citizenship education. The Core Competencies for Environmental Education for Sustainability, part of the DGE's Education for Citizenship framework, provides a flexible framework for personal and social development. Numerous projects and initiatives, including Eco-Schools, Young Reporters for the Environment (JRA), "Heróis de toda a espécie," and the "Econtigo Ecomtodos'' Programme, are part of Portugal's National Citizenship Education Strategy, promoting environmental awareness and responsibility among students through interactive and dynamic approaches.

Various strategies at both national and European levels have been implemented to address environmental concerns and promote ecological education. In **Bulgaria**, institutions such as the Ministry of Environment and Water and the Ministry of Energy, along with programs like the National Waste Management Plan and the National Recovery and Resilience Plan, play vital roles in achieving sustainable waste management and facilitating green transition reforms in education. These initiatives aim to develop state educational standards, upgrade vocational training for digital and green transformation, and prepare the education system to foster ecological culture and habits. The Strategic Framework for the Development of Education, Training, and Learning in Bulgaria emphasises education for sustainable development, highlighting the importance of partnership and joint policies to achieve sustainable development goals at all levels.

Key Takeaways:

- **Recognition and Legislation:** Countries prioritise environmental education, but many need to update outdated strategies and enforce legislation effectively.
- **Integration and Collaboration:** Efforts focus on integrating environmental education across educational levels, with collaboration among institutions, NGOs, and international partners.
- **Skills Development:** There's a strong emphasis on developing green skills and competencies to meet the demands of a sustainable economy.

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- **Community Engagement:** Strategies aim to engage communities and promote practical application of environmental knowledge, fostering environmental responsibility.
- **Continuous Improvement:** While progress has been made, there's a need to ensure consistency across educational levels, enhance teacher training, and expand focus on climate change education.

1.3 EGD on waste management and its practical application on VET Education

The European Green Deal (EGD) has shaped environmental education and waste management as critical components of vocational education and training (VET), ensuring that future generations are equipped with the knowledge and skills to address pressing environmental challenges.

The implementation of the European Green Deal in **Poland**, presents new challenges, including the emergence of 'green' jobs requiring specific competencies. In 2022, four competence areas were identified for the green transformation: embodying sustainability values, valuing sustainability, supporting fairness, and promoting nature. Each area encompasses key competences, such as critical thinking and political agency. In Poland, ecological education is integrated into environmental education, starting from early education and continuing through secondary education. Vocational schools and technical colleges focus on occupations in demand in the labour market, including waste management, particularly in logistics and transport professions. The Integrated Education Platform provides access to educational materials, and the non-formal education sector offers courses, especially in renewable energy professions. Companies have dedicated departments for waste management to comply with legal regulations.

In **Greece**, the implementation of the European Green Deal in VET education is crucial for preparing a skilled workforce for the transition to a green economy. Despite these challenges, efforts are underway to align VET education with the principles of the European Green Deal and promote sustainability in waste management and beyond.

The development of Environmental Education (EE) and Education for Sustainable Development (ESD) in **Cyprus** has evolved over the years, with a significant boost during the UN Decade of ESD from 2000 to 2004. While existing curricula and training programs are up to date, continuous improvement is necessary due to the dynamic nature of environmental issues. Cyprus' waste management strategy is based on the waste hierarchy, with legislation and plans focusing on waste prevention, reuse, recycling, and disposal. Vocational Education and Training (VET) providers in Cyprus face challenges in attracting learners to green career opportunities despite increased employment opportunities in this sector. There's a need for better dissemination of information through various channels and collaboration with

industries. VET providers offer some environmental training, but there's a lack of market orientation, and infrastructure costs hinder green practices adoption by businesses. Trainers express a need for more specific technical knowledge, training, and coordination among VET providers, particularly in the public sector, where bureaucratic inefficiencies exist.

In **Italy**, there is a limited availability of publicly accessible resources for teacher training on climate change. Notable resources include the Didactical Kit about Climate Change from the ISPRA and a webinar organised by the European Commission's Teacher Academy. Collaboration between non-governmental organisations, civil groups, businesses, and government ministries aims to provide these resources. However, there's a lack of recent development in educational materials specifically focused on sustainable waste management.

The **Portuguese** government is actively promoting policies for sustainable material management aligned with the European Green Deal (EGD). These policies aim to enhance environmental quality, protect human health, and ensure efficient use of natural resources. The Portuguese Environment Agency (APA) oversees waste management activities, licensing, monitoring, and issuing technical standards. APA follows national waste policy, shaped by EU directives, to prevent waste, utilise resources efficiently, and return materials to the economy. Key guidelines include the National Waste Management Plan (PNGR), Strategic Plans for Municipal and Non-Urban Waste, and the Bio-waste Strategy. These plans undergo public consultation to encourage engagement. Transitioning to a circular economy highlights waste management's importance. Initial and continuous vocational education and training (VET) are crucial for equipping the workforce with necessary skills and fostering career opportunities in the green transition.

The Green Deal presents a significant opportunity for **Bulgaria**, promising economic growth and technological advancement across various sectors. It will attract investment, both public and private, through initiatives like the Sustainable Europe Investment Plan, particularly benefiting energy, industry, infrastructure, transport, and the environment. This will enhance the competitiveness of Bulgaria's economy, particularly in energy efficiency. Within the educational system, courses like "Ecology and Environmental Protection" offer students insights into ecological principles, natural resource management, and pollution. Additionally, extracurricular programs like the Green Schools initiative promote environmental awareness and encourage actions such as waste reduction and energy conservation among students.

Key takeaways:

- **Integration of Sustainability in VET:** Countries are aligning VET education with the principles of the European Green Deal to equip future generations with skills for green jobs, including waste management roles.
- **Skill Development for Green Jobs:** Competence areas and key competences are identified to meet the demands of the green transformation, emphasising sustainability values, fairness, and critical thinking, particularly in waste management occupations.

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- **Challenges in VET Education:** VET providers face challenges in attracting learners to green career opportunities despite increased employment prospects. There's a need for better dissemination of information, market orientation, and coordination among VET providers.
- **Resource Availability and Collaboration:** Limited publicly accessible resources for teacher training on climate change and sustainable waste management highlight the need for collaboration between NGOs, civil groups, businesses, and government ministries to provide necessary resources and training opportunities.
- **Policy Alignment and Economic Opportunities:** Governments are promoting policies for sustainable waste management aligned with the European Green Deal, aiming to enhance environmental quality, protect human health, and ensure efficient resource use. Transitioning to a circular economy highlights the importance of waste management, with initial and continuous VET crucial for equipping the workforce and fostering career opportunities in the green transition.

1.4 *Successful examples*

Examples of best practices per country:

Poland:

- Sorteusz Application: An app that helps users segregate waste correctly by scanning product barcodes and providing guidance on disposal methods, along with features like waste collection reminders and educational games.
- Kampinos Primary School initiated the "Man and Forest" project, collaborating with a school in Lecce, Italy. Students gained hands-on experience, created multimedia presentations, and shared knowledge to promote a pro-environmental attitude locally and abroad, focusing on the values of Kampinos National Park.

Greece:

- Sustainable Cities and Communities Project: Implemented at the 2nd EPAL of Drama, this project focuses on proper drinking water management, involving teachers and students to promote environmental sustainability.
- Environmental Group at EPAL Alimos: A student-led initiative to organise environmental activities and education within the educational institution, fostering environmental awareness and action among students.

Cyprus:

- Tiganokinisi: An educational environmental program that collects used cooking oil from schools and transforms it into biodiesel, promoting sustainable development and environmental awareness among students.

- REC is a recent initiative that organises practical workshops of reuse and upcycling to adults, as well as children in schools where they present practical tips and things to do by reusing household waste.

Italy:

- Waste Prevention Portal: Developed by the Emilia-Romagna Region, this portal facilitates collaboration among stakeholders, provides information on waste reduction, reuse, and repair centres, and supports the preparation of prevention programs for local public administrations.
- Green school Network, which focuses its action within schools in order to reduce the consumption of plastic bottles, promote and respect the separate collection of waste within all the institutes, increase the processes of dematerialization and promote the paths of scientific divulgation.

Portugal:

- In waste management, a new facility on São Miguel Island in the Azores, backed by EU funding, implements advanced waste sorting, organic waste recovery, and energy generation, aligning with local and EU directives. This initiative aims to significantly increase waste recycling, eliminate biodegradable waste from landfills, and divert a substantial amount of solid waste annually, benefiting the island's environment and quality of life.
- In vocational education, the Vocational School of Agriculture of Marco de Canaveses (EPAMAC) exemplifies sustainability. Offering various courses, EPAMAC optimises energy consumption, conducts water quality analysis, and promotes native tree planting. Certified by European standards and the Eco-Schools program, EPAMAC stands as a model of sustainable practices in Portugal.

Bulgaria:

- Textile Reuse: The Association of Recyclers and Traders of Second-Hand Clothes promotes circular economy by collecting, sorting, and selling reusable textiles, complying with European and national legislation.
- Free Compost Campaign: Sofia municipality provides free compost to residents who pay municipal waste tax, utilising green waste to produce compost for local gardens and parks.

2. Experts consultation

2.1 Introduction

Each partner conducted a focus group with 10 members of the target groups: VET providers/trainers, VET learners, decision/policy makers – a minimum of which 3 organisations from each partner country contacted to participate in the focus group. A special effort was made to include members of the target group from less privileged

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backgrounds. A total of 60 VET providers and learners were reached and answered a set of questions following a summary and review based on the below thematics.

2.2 Familiarity with waste management

There is a mixed level of familiarity with waste management principles among participants. While some have a good understanding, others are limited to basic concepts like recycling and reusing. There's a general awareness of the waste management cycle, but not all participants are well-versed in its intricacies. Many are unfamiliar with specific regulations like the EU's Waste Framework Directive and tools such as Waste Hierarchy. Despite exposure to recycled and upcycled materials through organisations, students' knowledge beyond these terms is limited. Overall, while there's a baseline awareness of waste management principles, there's room for improvement in understanding the broader scope and regulations governing waste management.

2.3 Sources of information about waste management practices

The responses reveal various sources and channels relied upon for information about waste management practices. The Internet, particularly government websites, is a primary source, with participants accessing up-to-date data and legal acts despite the added difficulty. Seminars and activities provide valuable information, depending on the initiative of trainers or managers. Social media plays a significant role, alongside school programs and family education. Some participants also gain knowledge from classes, seminars, and workshops, with varying degrees of impact and continuity. Specific platforms like Pinterest and Instagram are highlighted for learning about upcycling and recycling. Traditional media and attending events are also mentioned as sources of information on waste management. Overall, individuals rely on a combination of online resources, educational settings, social platforms, and legal frameworks to stay informed about waste management practices.

2.3 The role of community members in improving waste management practices

The various roles community members can play in improving waste management practices mentioned are:

Awareness and Education: Community members can raise awareness and educate others on the importance of recycling and proper waste management through educational programs and awareness campaigns.

Participation in Voluntary Activities: Involvement in voluntary recycling, environmental clean-up, and awareness-raising activities.

Participation in Initiatives: Joining community initiatives aimed at improving waste management, such as organising recyclable collections or promoting reusable products.

Cooperation with Authorities and Educational Institutions: Collaborating with local authorities and educational institutions to implement recycling and awareness programs.

Personal Responsibility: Encouraging individuals to take personal responsibility for waste management and reducing environmental pollution.

Additional points include the importance of adapting educational approaches to the evolving understanding of waste management, such as focusing on the holistic waste cycle and adjusting activities accordingly. There's a desire for more active involvement from VET students in their school's waste management efforts. Collaboration between municipalities, governments, and civilians is seen as crucial, along with specific actions like separate waste collection, voluntary clean-up campaigns, and innovative solutions like packaging return machines in markets. Finally, emphasis is placed on lifestyle changes like walking, cycling, or using public transport to reduce waste generation. Overall, community engagement and cooperation are seen as essential for effective waste management practices.

2.4 Challenges in the current waste management system

The main challenges identified in the current waste management system:

- Lack of Infrastructure: Insufficient recycling bins and infrastructure for waste management.
- Lack of Awareness: Limited public awareness about proper waste management practices.
- Trust Issues: Lack of trust in waste management agencies.
- Incentives and Rewards: Absence of specific incentives for adopting environmentally friendly practices.
- Access to Information and Resources: Lack of information on recycling processes and materials like compost bins.
- Inadequate Landfill Management: Poor demarcation of landfill sites and insufficient staff for clean-up.
- Efficiency Concerns: Recycling inefficiency due to outdated equipment and insufficient recycling plants.
- Behavioural Change: Difficulty in changing behaviours and promoting sustainable waste management practices requires awareness and education efforts.

Specific challenges mentioned include inadequate separate waste collection in certain areas, poorly functioning ecological areas, damaged or insufficient bins, and issues with waste segregation at collection points. Concerns were also raised about the neglect of waste management practices in apprenticeship settings, the lack of recycling facilities, and insufficient recycling efforts in art schools.

Overall, the lack of information, infrastructure, and community engagement are identified as key obstacles to improving waste management practices. Integrated efforts at both the community and government levels are seen as necessary to address these challenges effectively.

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2.5 Environmental or health concerns related to waste management

The environmental and health concerns related to waste management mentioned in the focus groups are:

Proximity to Residential Areas: Storage of waste near residential areas, such as Selective Municipal Waste Collection Points (PSZOK), raises concerns about potential health risks for nearby residents.

Emerging Epidemics and Infectious Diseases: Participants express worries about the emergence of new epidemics or an increase in infectious diseases due to improper waste management.

Pollution: Various forms of pollution are identified, including water and aquifer pollution, aesthetic degradation of natural areas, air pollution from waste incineration, and soil pollution impacting health and nutrition.

Landfill Site Issues: Specific concerns are raised about landfill sites like Bellolampo in Palermo, where arson attacks release toxic pollutants into the environment, including carcinogens like PAHs.

Wildfires: Waste-related wildfires, sparked by lit cigars or discarded waste, are highlighted as a major concern in certain regions, such as Portugal.

Resource Overexploitation and Overflowing Landfills: In developing countries, resource overexploitation and overflowing landfills pose significant environmental and health risks.

Plastic Pollution: Plastic pollution in waters and soils, as well as the import of potentially toxic garbage for burning, are major concerns in Bulgaria.

Air Pollution: Air pollution, particularly in Bulgarian cities like Sofia, poses health risks to residents, with motor vehicle emissions identified as a significant contributor.

Overall, these concerns underscore the urgent need for effective measures and policies to address environmental and health risks associated with waste management practices.

2.6 Education and outreach programmes to promote responsible waste management practices

There is a great need for more education and outreach programs to promote responsible waste management practices. Key points include:

- Educational Shortcomings: Participants highlight a lack of relevant education from family and schools, as well as a dearth of organised information for teachers and students on waste management issues.

- Lack of Systematic Environmental Education: There's a need for more systematic environmental education to address gaps in knowledge and awareness.
- Awareness Raising: Apathy among students towards waste management emphasises the necessity for increased awareness and education efforts.
- Financial Barriers: Costly provision of special bins suggests the need for more funding and resources to make educational resources available.
- Systemic Challenges in VET Centres: Many VET centres lack proper waste disposal systems, indicating systemic issues that need to be addressed.
- Trust Issues: Disillusionment among the public about recycling collection processes presents an additional obstacle, highlighting the importance of building trust and transparency in waste management practices.
- Practical Solutions in Education: Education programs should offer practical solutions applicable in VET schools, internships, and daily lives, rather than just theoretical examples.
- Dedicated Courses: Participants believe there's a need for dedicated courses on waste management, as they feel such courses are lacking in their countries' educational systems.

Overall, the responses underscore the importance of comprehensive education and outreach efforts to address knowledge gaps, change behaviours, and promote responsible waste management practices across various settings and demographics.

2.7 Observations regarding waste management within VET institutions

Participants shared various personal experiences and observations regarding waste management within VET institutions:

- Incorrect Waste Segregation: Waste segregation is often done incorrectly due to a lack of knowledge on the subject. There's no common framework or institutional definition for waste management.
- Municipal Variances: Some municipalities are more active and provide special bins, while others lack resources for proper waste management infrastructure.
- Apathy of Students: Many students show apathy towards using even general waste bins, which contributes to improper waste management practices.
- Financial Barriers: Special bins are often expensive, and educational centres cannot afford them without state support. Additionally, there's a lack of sufficient bins, especially for paper waste.
- Lack of Recycling in Remote Areas: In more remote parts of the country, such as islands and villages, recycling is generally nonexistent, leading to a lack of environmental knowledge and awareness among students.
- Focus on Waste Reduction: Some participants emphasise the importance of waste reduction as a primary objective in waste management education, advocating for conscious consumption and alternative purchasing practices.

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- Need for Comprehensive Education: Participants stress the need for comprehensive waste management education from primary to high school levels, focusing not only on recycling and reuse but also on waste reduction and critical consumption.
- Positive Practices: Despite challenges, participants share positive practices within their institutions, such as recycling inorganic and organic waste, building composting facilities, and using reusable items during events and workshops.

Overall, participants highlight the importance of raising awareness, implementing practical waste management initiatives, and integrating waste reduction principles into educational curricula to promote responsible waste management practices within VET institutions.

2.8 Obstacles on waste disposal or recycling efforts in the VET sector

The responses highlight several barriers and obstacles hindering proper waste disposal and recycling efforts in the VET sector:

Insufficient Government Support: Lack of support from local and state governments hampers the effective implementation of recycling programs.

Lack of Political Will and Funding: Limited political will and funding, particularly from more technologically advanced countries, create barriers to developing and implementing advanced waste management systems.

Lack of Recycling Habits: Inadequate education from families and a lack of recycling habits contribute to indifference and unawareness of recycling behaviour among students.

Incomplete Recycling Bins: Absence of complete categories of recycling bins makes it difficult for people to effectively use them.

Infrastructure and Funding Constraints: Lack of infrastructure, organised information for teachers and students, and funding for recycling bin installation in schools affect students' attitudes towards social issues and recycling.

Need for Dedicated Environmental Education: Some teachers advocate for a dedicated subject addressing environmental issues, challenges, and alternative paths in school programs to enhance environmental education.

Practical Implementation in Schools: Despite facing obstacles in apprenticeship settings, participants within VET institutions have fewer hurdles in applying responsible waste management practices. However, there's a need for practical inclusion of sustainable waste management in school programs to address environmental challenges effectively.

Cultural Lack of Separate Waste Collection: There's a general lack of culture for separate waste collection in schools and the community, with students mainly receiving information about waste disposal from their families rather than from educational institutions.

Overall, these barriers underscore the importance of addressing systemic issues, enhancing education and awareness efforts, and providing adequate infrastructure and funding to promote proper waste disposal and recycling practices in the VET sector.

2.9 Education and training provided to VET students and staff regarding waste management

It is widely recognised that there is insufficient education and training provided to VET students and staff regarding waste management:

- Lack of Education: Participants unanimously agree that there is a lack of education in this area, with insufficient training provided to teachers on relevant issues.
- Reliance on Private Initiatives: Many participants state that what education they receive is through private initiatives, such as seminars and programs, rather than institutionalised training.
- Limited Impact of Individual Efforts: While some emphasise the importance of individual action and local initiatives in waste management, others express dissatisfaction with the limited impact individuals can have without broader systemic changes.
- Need for Practical Solutions: VET students feel that the education provided is inadequate for creating practical solutions to waste management issues. They express a desire for more educational materials focused on practical solutions.
- Insufficient Implementation in VET Centers: Participants note that since many waste management practices are not implemented in Bulgarian VET centres and schools, the education and training provided are not sufficient.
- Call for Additional Outreach Initiatives: There is a general consensus that additional outreach initiatives are needed to address the gap in waste management education and training.

Overall, participants believe that more comprehensive and institutionalised education and training programs are necessary to effectively address waste management challenges in the VET sector.

2.10 Recommendations to enhance waste management practices in VET institutions

Participants offer several recommendations to enhance waste management practices in VET institutions:

Education and Training: Provide specialised courses, training for staff, and ready-made environmental education programs on waste segregation and energy efficiency.

Awareness Campaigns: Organise public awareness campaigns in collaboration with municipal authorities, including hands-on activities for students and residents.

Strengthen Ecological Awareness: Transfer knowledge within the workplace and disseminate environmental protection practices to wider society.

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Participation in Initiatives: Engage in national or European initiatives to promote ecological education and sustainable development.

Implementation Strategies: Adopt strategies such as providing recycling bins, integrating environmental issues into the curriculum, organising competitions and awareness-raising campaigns, and arranging practical activities like visits to waste management sites.

Starting from Scratch: For institutions lacking waste management practices, prioritise waste segregation and prevention strategies, including rethinking product purchasing systems to favour sustainable supply chains.

Improved Communication: Ensure students are informed about the school's participation in environmental initiatives, certifications, and projects to increase awareness and engagement.

Dedicated Courses: Introduce dedicated courses on waste management in VET institutions, providing students with more employment opportunities and practical skills.

Collaboration with Local Institutions: Establish connections with local waste management institutions to facilitate teaching about waste management principles.

Organisational Improvement: Focus on better organisation and unification of waste management practices within the VET sector, with efforts to convince people of the importance of sustainable waste disposal and implement more awareness-raising campaigns.

Research and Analysis: Conduct studies on best European waste management practices in the VET sector to facilitate the transition of waste management education into the Bulgarian educational system.

Establish Working Groups: Form working groups to introduce innovations in waste management practices.

These recommendations aim to address various aspects of waste management, including education, awareness, practical implementation, and collaboration, to improve waste management practices in VET institutions.

3. Survey Results

3.1 Introduction

The questionnaire aimed to understand the needs and challenges that VET learners and VET providers face. In total, 384 people have responded to the online questionnaires from all partner countries and gathered the target groups' opinions about the needs, challenges, and facilitators required to raise awareness on sustainable waste management and better understand what areas need further improvement.

3.2 Profile of participants

Among the survey participants, the majority were between the ages of 16 – 22, as well as the age of 30 – 50. Almost 10% of participants were aged 22 -30 and another 10% were above 60 years old, where we can see that adults also recognise the importance of sustainability in their career development.

In the past three years, a mixed response emerged when asked about participation in sustainable or environmental education training. While a notable 34% of respondents stated their engagement in such programs, accounting for, the majority of 66%, stated they had not participated at all. Interestingly, in another subset, 79% affirmed their involvement in training, contrasting with only 24% who hadn't. Similarly, in a different group, 53% confirmed their participation, while 47% had not engaged in any environmental education endeavours. These statistics paint a varied picture of commitment to sustainability education based on the different partner countries, showcasing a range of engagement levels from enthusiastic participation to complete disengagement. Notably, a significant proportion of respondents, 45%, indicated they had not participated, with a mere 55% admitting to engaging in such activities to some extent.

3.3 Environmental Awareness

When participants were asked if they have participated in any training for environmental awareness, respondents provided varied insights. Forty-seven individuals revealed that the training they participated in was facilitated by their employers, while 39 respondents indicated that vocational education and training (VET) providers administered their learning sessions. A significant portion of 63 individuals reported that they received training from both sources, highlighting the multifaceted approaches to education within their professional development. However, a notable 220 respondents disclosed that they had not participated in any training at all, highlighting a generous segment of the participants that may have missed out on such opportunities.

When assessing the ease of discovering new training opportunities in environmental awareness, respondents expressed varying degrees of accessibility. A significant number of 60 individuals rated their experience at the lowest end of the spectrum, indicating that it was not easy for them to find out about such training initiatives. Similarly, 51 respondents echoed this sentiment by selecting the second option on the scale. However, a larger portion of 128 individuals leaned towards the middle ground, suggesting a moderate level of ease in accessing information about environmental awareness training. On the upper end of the scale, 77 respondents indicated a relatively smooth process of discovering these opportunities, while 48 individuals were notably enthusiastic, rating their experience at the highest level of ease, signifying that it was easy for them to find out about new training in environmental awareness.

3.4 Sustainable Waste Management

Participants' reluctance to engage in training to enhance their sustainable waste management skills arise from a multiple of factors, as indicated by their varied responses. A substantial portion, comprising 117 individuals, admitted to never considering participation

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in such thematic training, suggesting a fundamental lack of awareness or interest. Additionally, 45 respondents cited inconvenience regarding the location of these programs, while 59 individuals pointed to scheduling conflicts with the timing of the training sessions. Moreover, 43 participants highlighted issues with the delivery methods, indicating that the means of these programs were not convenient for them. Concerns about the length of the programs were raised by 49 individuals, while 35 respondents cited dissatisfaction with the frequency of classes. Notably, 64 participants expressed apprehension due to limited job prospects requiring these skills in their country, while 27 individuals felt that the content of the programs did not align with their current needs. Other factors contributing to discouragement included concerns about the quality of educators, outdated materials, and the perceived lack of value placed on such training by their employers. A significant number of 71 individuals also cited miscellaneous reasons under "Other," highlighting the complexity of barriers faced in pursuing environmental education and skill development.

Assessing the effectiveness of Sustainable Waste Management education training in facilitating job opportunities or career advancement produced mixed sentiments among participants. A significant majority of 158 individuals rated their experience at the lower end of the scale, indicating that the training they received did not sufficiently equip them with opportunities to secure employment or progress within their current roles. Similarly, 41 respondents echoed this sentiment by selecting the second option on the scale. While a substantial portion of 91 individuals leaned towards the middle ground, suggesting some level of effectiveness in providing job prospects or career advancement opportunities, a smaller yet notable group of 53 individuals expressed a positive outlook, indicating that the training did indeed offer them sufficient avenues for professional growth. Lastly, 38 respondents were notably optimistic, rating their experience as the highest level of effectiveness, signifying that the training provided them with ample opportunities to find employment or advance in their careers.

3.5 Green Transition

Following the participation in training regarding Green Transition or any other environmental education, respondents offered a diverse array of recommendations for improvement. Some expressed a desire for increased accessibility and awareness of such programs, emphasising the importance of providing and publicising these opportunities to encourage participation. Others highlighted the significance of practical application and up-to-date information, suggesting that training content should be updated regularly and offer tangible, real-world examples for better understanding. Concerns about the duration of the training, the quality of trainers, and the relevance of content were also raised, indicating a need for improvements in these areas. Overall, the recommendations reflect a collective aspiration for more effective, engaging, and practical educational initiatives that address contemporary challenges and empower individuals to make meaningful contributions to sustainability.

Assessing their willingness to attend future training, a positive outlook on attending future training among the respondents, with an average of 73% of all participants. This indicates a more than moderate interest in pursuing additional environmental education, should it be

made available. Participants expressed a wide array of interests and learning objectives they would like to pursue in environmental education training. Integration into vocational education and training emerged as a priority, highlighting the desire to incorporate environmental principles into professional skill development. Many individuals expressed a keen interest in understanding their personal impact on the environment and seeking ways to enhance their contributions. Themes such as climate change and its urban implications, sustainable city planning, waste management methods, and renewable energy sources garnered significant attention, reflecting a desire for practical knowledge applicable to daily life and professional contexts. There was also a strong emphasis on social and health aspects of sustainability, underscoring the interconnectedness between environmental well-being and societal advancement. Participants expressed a need for comprehensive education on recycling, waste management, and environmental awareness to strengthen their "green skills" and make informed choices. Additionally, there was a notable interest in learning from international best practices and implementing innovative, interactive approaches to engage younger generations in ecological living practices. Overall, the responses highlighted a multifaceted interest in environmental education, encompassing practical skills, theoretical knowledge, and a commitment to sustainable living practices.

Finally, when asked on the preferred method of finding out about new training a plurality of the respondents favour social media as a way to learn about new training opportunities. This is followed by email communication. Meanwhile, a smaller but noteworthy number of respondents prefer to be informed by their employers, as well as around 5% of participants indicating varied preferences for receiving such information such as radio or television. These insights underscore the need to employ a variety of communication channels to effectively reach different audiences.

4. Conclusion

Through the exploration of green education and sustainable waste management practices in Poland, Greece, Cyprus, Italy, Portugal and Bulgaria within the framework of vocational education and training (VET), this transnational report highlights the complex approaches and challenges faced by each country. Despite varying socioeconomic contexts, all countries recognise the importance of environmental education and waste management in achieving sustainability goals.

The desk research conducted provided insights into the current strategies on green education in each country, revealing both progress and areas for improvement, demonstrating a commitment to environmental education, with each country implementing strategies tailored to their unique contexts. The European Green Deal (EGD) serves as a guiding framework for waste management and environmental education initiatives across these countries, emphasising the importance of equipping the workforce with green skills and competencies.

Something to highlight through this research is the importance of community members playing a crucial role in improving waste management practices through various means. Firstly, by raising awareness and educating others about the importance of recycling and

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proper waste management, they lay the foundation for behavioural change. Engaging in voluntary activities such as recycling drives and clean-up campaigns not only directly contributes to waste reduction but also fosters a sense of community responsibility. Additionally, participating in community initiatives and collaborating with local authorities and educational institutions helps in implementing effective waste management programs at the grassroots level. Encouraging personal responsibility among individuals further reinforces the importance of sustainable practices in daily life. However, several challenges persist within the current waste management system, ranging from inadequate infrastructure to a lack of awareness and trust in waste management agencies. Addressing these challenges requires integrated efforts from both the community and government levels. Improving infrastructure, increasing public awareness, and building trust through transparent practices are essential steps towards overcoming these obstacles. Furthermore, specific environmental and health concerns related to waste management highlight the urgent need for action. From proximity to residential areas to pollution and wildfires, these challenges underscore the critical importance of implementing effective waste management practices to protect both the environment and public health.

Education and outreach programs play a pivotal role in promoting responsible waste management practices. However, there is a recognized need for more comprehensive and institutionalised education, particularly in vocational education and training (VET) institutions. By providing specialised courses, awareness campaigns, and practical solutions, educational institutions can equip individuals with the knowledge and skills necessary to address waste management challenges effectively. While there is a willingness among respondents to engage in future training, there are also barriers such as lack of awareness, inconvenience, and concerns about the effectiveness of training programs. Addressing these barriers requires increased accessibility, practical application of knowledge, and relevance to current environmental challenges.

The findings of this report serve as a foundation for further dialogue and cooperation among stakeholders, with the ultimate goal of advancing sustainability and green skills development across Europe. Enhancing waste management practices requires collaborative efforts involving community members, educational institutions, government agencies, and other stakeholders. By raising awareness, fostering community engagement, and providing comprehensive education and training, we can work towards building a more sustainable future for generations to come.

5. Annexes

5.1 Desk research Questions

1. Country profile (including Country, Partner organisation, author - drawing on existing profiles, we should present a profile of our country focused particularly on sustainable waste management and environmental education. In this profile, we should present demographic, economic, and social data that would provide a canvas for the reader to understand the context in which the programmes are being developed and implemented:

General Information - Context
Participation of VET provider / learners in the field of environmental education,
Participation in formal education, non-formal education and training and informal learning)

2. Current strategies on Green Education (name of country)

Vision, priorities, and overview of the action plan with key directives and policies: European Skills Agenda, Education for Sustainable Development Framework for 2030, etc.
A critical review of current strategies and policies on environmental education

3 . EGD on waste management and its practical application on VET Education

Overview of available instructional strategies, EGD applications and instructional strategies strategic green practices and teaching pedagogies of VET providers
Competences of VET Providers

4. Lessons from successful examples

A review of one or two case studies per country

5. Recommendations

Key principles that can be transferred and adapted for the project
Best practices and methods for supporting sustainable waste management and environmental education.

6. References

The material should include in-text citations of all sources (when deemed necessary), using the APA referencing style [e.g. Author(s) (year, pp.)].

5.2 Focus group Questions

1. Are you familiar with the principles of waste management?
2. What sources or channels do you rely on for information about waste management practices?
3. What role do you think community members can play in improving waste management practices?
4. What challenges do you believe exist in the current waste management system in your community/country?
5. Are there specific environmental or health concerns related to waste management that you find particularly worrisome?

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6. Do you think there is a need for more education and outreach programmes to promote responsible waste management practices?
7. Can you share your personal experiences or observations regarding waste management within VET institutions?
8. Are there any specific barriers or obstacles that hinder proper waste disposal or recycling efforts in the VET sector?
9. Do you believe that there is sufficient education and training provided to VET students and staff regarding waste management?
10. Based on your experiences and insights, what recommendations would you make to enhance waste management practices in VET institutions?

5.3 Survey Questions

Introductory Section

1. Please select your country below:

Poland
Italy
Portugal
Bulgaria
Greece
Cyprus

2. What is your age group?

Below 16
16-18
19-22
22-30
30-50
50-60
Above 60

3. Have you participated in any training in the last three years that focuses on sustainable or environmental education?

Yes
Not at all

4. Which of the following statements applies to you?

The training I participated were offered by my employer
The training I participated were offered by a VET provider
Both
Other

Section 2: Environmental Awareness

1. Was it easy for you to find out about new training in environmental awareness? (From 1 to 5. 1 =No, 5=Definitely)
2. I feel discouraged to participate in training to build my environmental skills because: (Select as many choices as you think apply in your situation)

- I have never thought of participating in a training on this thematic

- The location of these programmes is not convenient
- The time of these programmes is not convenient
- The means of these programmes are not convenient for me (e.g. they are face-to-face, online, blended learning etc.)
- The length of these programmes
- The frequency of classes
- My employer does not value these trainings
- There are not many jobs that need these skills in my country
- The content of these programmes does not address my current needs
- Educators are not well trained to offer these programmes
- The material and sources that these programmes offer are not up-to-date
- Other ….

3. Has the training you participated in on environmental education offered you enough opportunities to find a job or progress in your current job? (From 1 to 5. 1 =No, 5=Definitely)

4. Optional Open Question. If you have not selected 'Definitely' in the previous question, could you please explain if you have any recommendations about what you would like to be improved? If more training in environmental education were available, how willing would you be to attend? (From 1 to 5. 1 =No, 5=Definitely)

5. If yes, what would you like to learn?

Section 3: Sustainable Waste Management

1. How easy is it for you to find out about new training on Sustainable Waste Management? (Very Easy, Easy, Difficult, Very Difficult)
2. I feel discouraged to participate in training on building my Sustainable Waste Management because: (Select as many choices as you think apply in your situation)

- I have never thought of participating in a training on Sustainable Waste Management
- The location of these programmes is not convenient
- The time of these programmes is not convenient
- The means of these programmes are not convenient for me (e.g. they are face-to-face, online, blended learning etc.)
- The length of these programmes
- The frequency of classes
- My employer does not value these trainings
- There are not many jobs that need these skills in my country
- The content of these programmes does not address my current needs
- Educators are not well trained to offer these programmes
- The material and sources that these programmes offer are not up-to-date
- Other ….

3. Has the training you participated in Sustainable Waste Management offered you enough opportunities to find a job or progress in your current job? (Definitely, Slightly, Not at all, N/A if you have not participated in any training)
4. Optional Open Question. If you have not selected 'Definitely' in the previous question, could you please explain why and make recommendations based on what you would like to be improved?
5. If more training in Sustainable Waste Management was available, how willing would you be to attend? (From 1 to 5. 1 =No, 5=Definitely)

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Section 4: Green Transition

1. I feel discouraged to participate in training regarding Green Transition or any kind of environmental education because: (Select as many choices as you think apply in your situation)

- I have never thought of participating in a training
- The location of these programmes is not convenient
- The time of these programmes is not convenient
- The means of these programmes are not convenient for me (e.g. they are face-to-face, online, blended learning etc.)
- The length of these programmes
- The frequency of classes
- My employer does not value the training
- There are not many jobs that need these skills in my country
- The content of these programmes does not address my current needs
- Educators are not well trained to offer these programmes
- The material and sources that these programmes offer are not up-to-date
- Other ….

2. If more training programmes were on environmental awareness and sustainable waste management were available, how willing would you be to attend? (From 1 to 5. 1 =No, 5=Definitely)
3. How would you like to find out about new training skills?

- Via E-mail
- On Social Media
- From my employer
- Via television
- Via radio
- By post
- Other ….

4. Optional Open Question: Are there any other needs and challenges you may face? Please state them below and add any recommendations you may have. (Open Ended Question – perhaps keep it as a short text rather than long)

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