



Methodology for Sustainable Learning Programs



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Innovation



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1. INTRODUCTION

The rapid shift towards a climate-neutral Europe and digital transformation is changing the way people work, learn, take part in society and lead their everyday lives. As the European Skills Agenda set, Europe can only grasp these opportunities if its people develop the right skills. The Covid-19 pandemic has also had a profound impact on millions of people in the EU have lost their job or experienced significant income loss. Many will need to acquire new skills and move to new jobs in a different sector of the economy. More will need to upskill to keep their job in a new work environment. Flexible responses are requested from VET systems, with appropriate methodologies to foster resilience and responsiveness to changing societal and labour market needs. VET providers play a fundamental role in this scenario: as stressed by the *Council Recommendation of 24 November 2020 on VET for sustainable competitiveness, social fairness and resilience (2020/C 417/01)*, high quality and innovative VET systems provide people with skills for work, personal development and citizenship, which help them to adapt to and deliver on the twin digital and green transitions, to cope with emergency situations and economic shocks, while also supporting economic growth and social cohesion. This *Methodology for Sustainable Learning Programs* aims to support VET teachers and trainers through a set of resources and guidelines to develop **learning programs that are inclusive, digital, green, and more responsive to societal and labour market needs**. The contents of this publication seek to:

- support the reform of vocational education and training providers toward more inclusive practices, empowering them to innovate their pedagogical approaches and learning materials to meet the learning needs of diverse VET learner groups, as well as enhance skills for digital transformation for both VET providers and learners, and support the integration of environmental-friendly means of teaching and training.
- support the development of VET systems that are proactive and flexible in supporting broader innovations for social and environmental sustainability objectives and support the involvement of all the stakeholders who have an interest in quality and innovation in VET in shaping VET Provision, in order to anticipate skill needs of fast-changing labour market scenarios.

1.1 The Project

The *Methodology for Sustainable Learning Programs* is a result of the “**PI-VET: Powering the Innovation of Vocational Education and Training**” project, a Cooperation Partnership that received funding by Erasmus+, the EU European Union Programme for education, training, youth and sport. The project is implemented by a consortium composed of five organisations:

- **Institute Perspectives**

<https://www.institute-perspectives.com/>

Non-governmental organisation based in Bulgaria, leader of the project consortium.

- **Center for Social Innovation**

<https://csicy.com/>

International Research & Development Center based in Cyprus.

- **Femxa Formación**

<https://www.grupofemxa.es/>

Spanish SME specialized in consulting and training for employment.

- **Lascò**

<https://lasco.io/>

Italian Innovative SME, specialized in innovation and digital transformation.

- **Technological University of the Shannon: Midlands Midwest**

<https://tus.ie/>

Irish Higher Education Institution focusing on applied learning and innovation.

During thirty months (2022-2024), the consortium will pursue the following **objectives**.

General Objectives

- To support VET providers to co-create with learners and external stakeholders learning programs that embed inclusive, digital and green practices and that are more respondent to societal and labour market needs.

- to digitalize VET training for trainers, giving them not only tools, but methodologies, guidelines and platforms for being used in their daily work in a collaborative manner.
- to foster the involvement of all the stakeholders who have an interest in the innovation and quality in VET at a national and international level (e.g., companies, institutions and policymakers, organizations representing the business world, VET centres, students, families, NGOs, youth workers, trainers, business, etc.) to shape VET provision through a virtual cooperation platform and a Public Ranking Tool.

Specific Objectives

- To create the pedagogical materials for VET providers to design more innovative learning programs involving digital, green and inclusivity.
- to create Sustainable Learning Canvases to let VET providers collaboratively create innovative sustainable curricula using the power of co-creation and visual thinking.
- to increase the awareness of VET providers and business representatives from partner countries about the use of innovative education and co-creation to promote quality developments in partner countries and Europe.
- to support VET providers in gaining knowledge and skills to increase digital, green, and inclusive transformations in their own centres and practices, to extend the cooperation of VET with relevant stakeholders such as local and regional companies, work organizations, public institutions, to give participants better opportunities towards employment and shape programs that are more respondent to societal and labour market needs.
- to develop an international cooperation platform, with a public raking system to foster the attractiveness in VET and societal engagement.

1.2 Project Result 1: Methodology for Sustainable Learning Programs

The purpose of project result 1 is to provide a reference structure and guidelines for VET providers to co-create innovative learning programs that are inclusive, digital and green. This methodology will provide VET teachers and trainers with a framework to contribute to the EU's recovery from the coronavirus crisis, by aligning their teaching and training offers to the needs identified by the EC in the "Communication on Achieving the European Education Area by 2025" (2020) in the frame of the "Inclusion" and "Green and Digital transitions" dimensions. In detail, the Methodology aims to:

- support the reform of VET providers toward more inclusive practices, and therefore empowering them to innovate their pedagogical approaches and learning materials to meet the learning needs of diverse VET learner groups.
- enhance digital competencies and skills for digital transformation both for VET teachers and trainers and learners.
- support the integration of environmental-friendly means of teaching and training.

Although the methodological framework is addressed to teachers and trainers of both Initial and Continued Vocation Education and Training, it has been designed to be applicable to any curriculum and transferable to any other public or private Education and Training provider.

The methodology provides a set of principles, tools, and practices for VET providers to develop courses and programs by following a guided pathway that requires them to include measures to:

- ensure access to the course/program for marginalized groups and ease the transition to work for disadvantaged learners.
- foster gender equality and challenge gender stereotypes within their practices and materials; assure that learners acquire the basic, transversal and technical skills needed to thrive in fast-changing economic scenarios and in the green economy of the future.
- integrate environmental sustainability in their practices.

- engage relevant stakeholders into a wider supportive ecosystem, which can support the continuous improvement of learning practices and methods, and more agility to adapt to dynamic labour markets.

The methodology is therefore structured into four main layers (discussed further in section 3 of this publication):

- requirements, practices, and tools for inclusive learning programs.
- digitalisation of VET providers' teaching and training practices.
- requirements, practices, and tools to facilitate green and digital transitions.
- development of supportive ecosystems around VET providers and learners.

Overall, this result provides the foundations to building autonomously innovative programs, and therefore represents a reference guide for VET providers to be innovators themselves, supporting and encouraging them to engage with new inclusive, green and digital teaching and training methods and tools. VET providers that will adopt this Methodology are expected to:

- increase knowledge and awareness regarding inclusive, digital and green teaching and training practices, and gain know-how to integrate them into their programs.
- increase the innovation and attractiveness of their education and training programs.
- improve their teaching and training practices.

The following section will now discuss the development process which led to the creation of the methodological framework.

2. DEVELOPMENT PROCESS

This section discusses the processes which ultimately led to the development of the methodological framework for sustainable learning programmes.

2.1 Virtual Knowledge Fair

The purpose of the virtual knowledge fair was to enhance the exchange of good practices and knowledge among Vocational Education and Training teachers and trainers from the participating countries, in the fields of inclusive, digital and green teaching and training practices, and VET ecosystems building at local, regional and national level.

The fair was hosted using the Zoom digital platform on the 18th & 19th of May 2022. Between the two days of the event, there were approximately 144 attendees present from Bulgaria, Spain, Cyprus, Italy, and Ireland.

The Virtual Knowledge Fair included a landing page which showcased a best practice area for inclusive, digital, green and supportive ecosystem practices in vocational education and training; a PI-VET area which provided the visitor with further information about the project itself; and a direct link to join the Zoom conference (see figure 1 below).



Figure 1 Virtual Knowledge Fair Landing Page

The training was two hours long in duration for both days, consisting of a welcome, project introduction, a one hour and fifteen-minute workshop session (split into inclusive, digital, green and supportive ecosystem workshops), result/insights presentation, followed by final remarks and the meeting closure.

The attendees first joined the main conference Zoom area for the welcome and the introduction of the PI-VET project; and were later allocated into inclusive, digital, green and supportive ecosystem breakout rooms for the one hour and fifteen-minute workshop session.

Participants were able to discuss successful initiatives, projects and practices during these workshop sessions. The participating organisations involved two facilitators and a speaker per pavilion, in order to, respectively, enhance communications and discussions, discuss key themes and keep track of the results. The workshop sessions consisted of a twenty-minute theme introduction presentation which introduced the inclusive, digital, green and supportive ecosystem perspectives; and a forty-five minute interactive session which involved an icebreaker and open discussions with the attendees. Ice-breaker activities took place in each breakout room to facilitate networking between participants and encourage them to participate in the engaging discussions.

Finally, all attendees re-joined the main Zoom conference area to present the insights and results of the workshop discussions, which was followed by final remarks and the meeting closure. These results and insights of the workshop discussions provided the PI-VET consortium with valuable information which supported the development of the methodology for sustainable learning programmes.

The following section will now discuss these results / insights which were gathered during the workshop sessions.

2.1.1 Inclusive Workshop Results

As previously stated, the inclusive workshop session was one hour and fifteen minutes in duration, and included attendees from Bulgaria, Spain, Italy, Cyprus and

Ireland. This workshop was led and facilitated by the project partners from Cyprus, CSI CENTER FOR SOCIAL INNOVATION LTD. The purpose of this workshop was to discuss the theme of inclusive teaching and training practices, successful initiatives, or inclusive projects in Vocational Education and Training.

During the interactive segment of the workshop, the participants were asked to complete a survey to provide their thoughts on inclusive practices in further education. The results are highlighted and discussed below.

Roles

When asked about the roles in the Vocational Education and Training sector, some of which were identified included educators, leaders, teachers and learners.

Roles in the VET Sector
<ul style="list-style-type: none"> • Educator • Leader • Teacher • Learner

Inclusive Practices

As per this question, participants were asked about the practices that they use in their daily roles as a Vocational Education and Training teacher or provider. Some examples focused on activities such as music, art, interactive games or drama etc. Other examples emphasised emotional intelligence in treating each student with patience, love, empathy, fairness and listening to them. Overall, most participants indicated that they use some kind of inclusive practice in their daily lives. Please refer to the below table for a summary.

What inclusive practices do you currently use in your daily role as a VET teacher/ provider?
<ul style="list-style-type: none"> • Music and Art activities, like dance groups and sculptures to disinhibit students and help them all feel included. • Respecting each student and treating each student with patience and love so that they can reach the highest form of their capabilities.

- Listening to students, taking into consideration their skills and interests.
- Being empathetic and fair with everyone.
- Use of interactive games and drama tools to enhance inclusion. (Breadth therapy, art workshops)

Inclusive Tools

This question asked the participants if they were aware of any tools or best practices that could be used to make their practice more inclusive. Overall, the participants found this question challenging to answer. Despite trying to be inclusive in their practices and being aware of some examples of such tools, most expressed that they would appreciate and find it useful if there was more access to these. A summary of some of the responses can be seen below.

Are you aware of any tools or best practices that one can use to make his practice more inclusive?

- I know there are, but we need so much time to explore and practice with them...
- I think the best tool is common sense and empathy.
- Online toolkits
- Inclusion is ongoing, not one-off training.
- bread therapy, art workshops, drama tools

Change

Participants were asked for their opinion on what needs to change or improve in Vocational Education and Training to make it more inclusive. Some of the suggestions referred to more involvement, collaborative work, smaller classrooms, more awareness, training and empathetic leadership. Please refer to the table below for a full summary.

What, according to your opinion, needs to change/ improve so that VET education becomes more inclusive?

- Greater institutional and educational agency involvement.

- It is a matter of working as a team and towards the same direction, with patience and material resources.
- Fewer pupils in the classroom. Teachers and students more aware of inclusion. Quality practical training.
- Smaller classrooms, more experienced teachers.
- Empathetic leadership from educators.
- Access to different sources.
- Become more aware of the diversity in the classroom, support all students and make safe spaces for them to express their needs.

Weaknesses

When asked about their weaknesses in inclusive practices, the most significant two suggestions were that of lack of material resources, and lack of opportunities. The table below contains a full summary of responses.

What do you consider your main weaknesses of practice to be when it comes to inclusion?

- Lack of material
- Lack of knowledge or opportunities to keep up with times and improve inclusiveness in my practices
- Not so many opportunities
- Lack of material resources and time
- Impatience
- Communication

Social Inclusion

This question asked the participants about what came to their minds when hearing the words “social inclusion”. The most significant suggestions referred to community, diversity, participation, equality, equity and progress. These results have been summarized in the table below.

What comes to your mind when you hear the words social inclusion?

- Society / community

- Participation
- Understanding
- Equality
- Support minorities
- Diversity
- Gender Equality
- Equity / equity of opportunities
- Connection with the local community
- Progress
- Fair relationships
- Everyone can participate

To conclude during the workshop (across both days), most participants indicated that they use some form of inclusive practice in their daily lives, suggesting activities and emotional intelligence examples. The key takeaway points from the workshop were that there is a need for greater awareness of the inclusive perspective, more access to inclusive tools, more collaborative work, training, material resources and opportunities.

2.1.2 Digital Workshop Results

The digital workshop was led and facilitated by the project partners from Ireland, Technological University of the Shannon: Midlands & Midwest (TUS). The purpose of this workshop was to discuss the theme of digitalisation in educational practices, successful initiatives, or digital projects in Vocational Education and Training. This workshop was led by guest speaker, Paul Keating, who is a Researcher, Sociologist, Community Worker, and Games and Design lecturer at the Technological University of the Shannon. Paul's vision is to represent people who have an interest in Virtual Reality (VR) that are underrepresented in education.

Linking into the theme of digitalisation and bringing the Virtual Reality (VR) experience into practice, Paul conducted the workshop using a Virtual Reality (VR) platform to demonstrate how it can be used in teaching and learning practices. The demonstration took place on a Virtual Reality (VR) setting of the Technological University of the Shannon's Clonmel campus.

Upon commencing the workshop, participants were asked if they were familiar with this technology. There was a mix of responses between those who have had prior experience with using this type of technology and those who were new to it. Those who have used this technology mentioned Second Life (online game / multimedia platform) in the educational context, and use of Virtual Reality (VR) in training engineering students to expose them to large scale industrial projects and different geographic areas.

Virtual Reality (VR) Practices

In introducing the theme, Paul discussed some of the practices in using Virtual Reality (VR). For example, video can be utilised as a tool for teaching and learning within a Virtual Reality (VR) platform. It can be used as an immersive video walk-through (e.g., scroll with hand to move around a construction site in the video for health and safety training) or a stationary video (ordinary video that does not move).

A computer-generated experience can be utilised to teach/train individuals how to use a specific product with a Virtual Reality (VR) adaptor and headset. These experiences can be interactive or non-interactive but most importantly they can be used to create realistic experiences/scenarios for training (e.g., Police training).

Game training (or gamified simulations) with headsets can be controlled as a game with real time scenarios for simulating stressful workplace scenarios.

Virtual environments can be used as meeting spaces to host meetings or conferences with visual representation of people as avatars. An example of such is Horizon workspace.

Benefits

There are numerous benefits associated with why teachers or trainers should use Virtual Reality (VR) in Vocational Education and Training. Some of the main benefits are that it is engaging (of marginal communities, people in rural areas

etc.), experimental (learning process stimulates work, motivates), situated (takes people to where they need to meet/be on site), creative (medium for creativity and experimentation), personalised (avatars to match the personality you would like to be represented), and safe (experiments or anything with safety concerns e.g. simulation for knee replacement, role play for firefighting).

Virtual Reality (VR) is not only a trend in how people may engage with technology in the next five to ten years, but also a medium for inclusion and support of the green perspective.

There is great value in exposing people to different experiences using Virtual Reality (VR). For example, you can reconstruct a job centre or a welfare centre in virtual reality. People who are socially anxious or have a learning disability can then visit said centre virtually to become comfortable with the layout, familiarise themselves with where everything is or where they need to go. This had been applied to a project aimed at people with Autism. The workers in the actual job centre would wear a red scarf and there would also be a worker with a red scarf in virtual reality. The user/visitor would be told that the person with the red scarf was Autism friendly, and if they would approach them, they would be provided with support. In the virtual environment there was also a safe space so if the user/visitor was panicked they could move towards the safe space and sit on a particular seat. The person in the job centre would then know that the user/visitor was a person with Autism in distress. If that same user/visitor would then go to that same job centre in reality, it would contain the person with the red scarf and the safe space to sit (the virtual environment was a digital replica of the real physical environment). This was designed by a person with Autism for people with Autism hence why it worked so well, as the designer knew exactly what was needed.

Main Concerns

A main concern which was raised by attendees in relation to this technology was cost, and how Virtual Reality (VR) technology can be brought into classrooms given its high capital cost, short obsolescence/limited lifespan and cost of applications. A counter argument to this is that these things are becoming more affordable, and it is a technology that is becoming more widely available and accessible.

Another concern raised regarded technical competencies as not everyone could be comfortable using Virtual Reality (VR). People would need to be trained on how to use this technology.

Finally, there was a point raised of whether this type of technology was taken seriously enough or not. Initially adults may seem a bit more sceptical towards it, as they see it more as a game or a trivial. However, once people see how it can be used to engage people emotionally or how it can provide people with opportunities that they would not be otherwise able to have, then they take it more seriously. It is very important of how people are introduced to Virtual Reality (VR); thus, teachers or trainers should ensure that the initial experience is positive and constructive not to overwhelm the user.

Q&A Interactive Session

During the interactive segment of the workshop, the participants had the opportunity to ask Paul Keating questions about Virtual Reality (VR) and discuss this technology further as a group. The discussion of these questions and answers has been summarised table formats below.

Is Virtual Reality (VR) useful in Psychology?

There is therapeutic potential. It can be applied to cognitive behaviour and mindfulness to calm. The technology can be used to aid treatment of PTSD in a safe environment. Virtual Reality (VR) can also be used to train people in a preventative way (safe environment, free from danger), eliminating apprehension.

How do you train new people?

On a par with using Zoom. It may take time to encourage use of this technology or to spend money on the equipment. The trainer could encourage al to meet in Virtual Reality (VR) for walking debates or presentations.

What is the cost?

More affordable than it has ever been before or possibly will be again due to Facebook [Metaverse]. Youth organisations buy headsets as a good value and an investment.

The technology used is not driven by Microsoft or commercial business applications but by games companies who want the technology to be fun and engaging.

What do you think about Metaverse?

It is an interconnectedness of technology. There is however a concern of corporate control. It is inevitable, as seen with the other applications we use to converge and connect. It depends on the balance of time, mental and physical health. The Metaverse is only at its early stages but has the feeling of the internet from 20 years ago; where it was uncertain but exciting.

Concerns that might prevent an educator from using Virtual Reality (VR)?

Cost would be one. It can be expensive if creating for a small group but on larger scale it is more cost effective. An educator could however involve students in the creation process. For student projects, students could create the applications for people in isolated areas etc. for social inclusion/support. It is an excellent medium for inclusion.

Another possible concern is that there are very few people with the necessary skill sets now.

To conclude, the participants received an introduction to the topic of Virtual Reality (VR) in the context of Vocational Education and Training, with examples of some of the practices, benefits and concerns associated with this type of technology. The interactive Virtual Reality (VR) demonstration during the workshop helped to put the idea into perspective for the participants, particularly those new to the technology. The benefits of using Virtual Reality (VR) in Vocational Education and Training link to engagement, experimentation, creativity, situation, personalization and safety. A major concern identified by participants was the cost factor involved. Other concerns highlighted throughout the two days included the limited lifespan of the technology, cost of applications, shortage of necessary skills / discomfort or

hesitancy with using new technology and whether it is considered seriously enough. This indicates that cost plays a vital role in the deciding factor of whether to integrate this type of technology or not. The shortage of necessary skills, discomfort or hesitancy in using Virtual Reality (VR) and level of skepticism surrounding it suggests that it is still at a very early stage in its popularity of usage.

2.1.3 Green Workshop

The green workshop was led and facilitated by the project coordinator from Bulgaria, Institute Perspectives. The purpose of this workshop was to discuss the theme of green practices in teaching and learning, successful green initiatives, or green projects in Vocational Education and Training.

The following section will commence with the topic introduction that the participants received during the one hour and fifteen-minute workshop across the two days of the event.

Introduction to the Green Economy

The skills transformation for the green economy is of paramount importance because the way in which students are trained now will impact society in the decades to come. It should be highlighted that the green economy prioritizes the health of its people and the health of the planet as both are interconnected.

This means:

- Solar and wind power (photovoltaic solar panels and wind turbines), not coal, oil and gas
- Better public transport and electric vehicles, not petrol and diesel
- Energy efficient homes, not cold and draughty
- Protected nature and circular economy, not a single use throwing culture

As investments are done in renewable energies, housing and transport, green agriculture and green tourism; Vocational Education and Training needs to develop programmes to supply people with necessary skills for the new jobs.

Opportunities for green technology development are boundless concerning:

- Energy efficiency
- Green construction and renovation
- Ecological consumer products
- Electric transport

Consequently, the future “green” specialists should be aware of ecological crises. The human race has become cruel in the endeavours of destroying nature e.g., by polluting air, soil, water. Flora and fauna species are vanishing and climate change threatens the existence of life on the earth.

Pollutants come from all areas, ranging from transport to artificial fertilizers and even certain energy resources. The average CO₂ emissions from cars in 2018 in EU increased, reaching 120,4 grams of CO₂ per kilometre. It is a universal truth that humans live in a wonderful world full of natural resources. Earth can provide everything that is needed for sustainable development and a healthy life (e.g., pure air, pure water, pure soil). Protection of these natural resources can only be achieved through collaboration involving a variety of stakeholders such as scientists, youths, governmental and non-governmental organizations, the private sector, nature lovers etc. Such collaboration should place emphasis on cooperating with nature in the conservation of biodiversity and the development of green jobs.

The conclusion is that Vocational Education and Training educators should incorporate the following practices in their courses:

- Environmental preservation
- European Green Deal
- Vocational Education and Training for green jobs

The European Green Deal approved in 2020 consists of a set of policies and initiatives by the European Commission which aim to make the European Union climate neutral, a net-zero emitter of greenhouse gases by 2050 and demonstrate that economies will develop without increasing resource usage. Consequently, job growth is expected across almost all sectors as employers turn to more sustainable business models.

The transition to a green economy will open the job market and create new skill needs across sectors and occupations. This means that there will be a need to invest in upskilling and reskilling of the workforce where Vocational Education and Training will play an eminent role.

Apprenticeships, being closely related to the labour market, can swiftly adapt and ensure workers employability.

Having raised awareness of the green transition, the question remains whether the “green” perspective can be raised in Vocational Education and Training in line with labour market needs. Imbalances still exist between the skills offered and skills needed. An environmentally sustainable and low-carbon economy can be achieved if the Vocational Education and Training sector offers adequate training. This can be achieved when educators prepare more training materials specific to:

- Green Agriculture
- Green construction
- Green energy
- Green tourism

To support educators in the Vocational Education and Training sector in this transition, it is first important for them to understand the green economy.

Green agriculture refers to:

- Production of bio-products in organic agriculture without artificial pesticides
- Sustainable land management
- Improved water management systems
- Renewable energy resources
- Electric tractors and harvesting machines
- Research in climate resilient varieties of plants and animals

Green construction refers to:

- Situation of the building to achieve natural cooling and heating
- Energy efficient buildings – better isolated homes for cutting energy bills

Green energy refers to:

- Transition to wind and hydro energy, reducing the carbon footprint
- Decrease the import of inefficient vehicles
- Energy reducing transportation
- Renewable energy equipment – solar panels and wind turbines

Green water refers to:

- 75% of natural water is used in Agriculture
- Irrigation systems connected with local catchment facilities
- Rainwater harvesting
- Extensive sewage recycling
- Rural water supply strategy

Green tourism refers to:

- Ecotourism
- Educating hotel sector about sustainability and healthy environment
- Renewable energy
- Advertising green tourism

Green transport refers to:

- Electric vehicles
- Better public transport – less commuting time

CEDEFOP defines skills for the green economy as knowledge, abilities and attitudes needed to live, work and act in economies and societies seeking to reduce the impact of human activity on the environment. A 2021 CEDEFOP skills scenario envisages employment growth by 2030 amounting to about 2,5 million additional jobs. Unsurprisingly, the scenario foresees the strongest job growth in sectors with a high greening potential, such as water supply, waste management and construction. By the end of the decade almost 200,000 new jobs are said to be created in the electricity sector alone.

As the green transition of the economy will rely on technical development and innovations, some high-skilled new occupations will be needed. The green

transformation in jobs will be evident across various occupations and sectors, bringing about radical changes in skill needs. Consequently, these must be reflected in education and training provision at all qualification levels. Vocational Education and Training will be crucial in providing skills sets that evolve flexibility and reflect the dynamic nature of the new green paradigm. It will therefore be the task of the Vocational Education and Training providers to prepare capable workers for these green jobs. Here are a few examples of green jobs: solar panel installer, recycling plant technician, sustainability supervisor, drone engineer, electric vehicle engineer, environmental science specialists, nature monitor and biomass boiler installer.

Interactive Segment of the Workshop

During interactive segment of the green workshop, participants were asked to fill a SWOT analysis framework (opportunities, strengths, weaknesses and threats) in the context of Vocational Education and Training in applying the green economy philosophy and preparing specialists for green jobs.

These have been summarised in the table below:

Internal Strengths	External Opportunities
<ul style="list-style-type: none"> • Natural resources • Theoretical well-prepared professors and educators in all spheres of the green economy • Traditions in bio-production • Well-equipped STEM centres in the VET schools 	<ul style="list-style-type: none"> • National programs for encouragement for the preparation of workers for the green jobs • Funds for STEM centres • Erasmus+ schools projects • Mobilities of staff, teachers and students for experience exchanges • Apprenticeships in EU partner countries • Volunteering opportunities • Role of the NGO sector for soft skills development and exchange of experience

Internal Weaknesses	External Threats
<ul style="list-style-type: none"> • Not enough investments for the equipment for practical activities • Weak initiatives of the school staff used to be commanded what to do • Lack of belief in own activities for making the change • No interest in creating national and European partnerships 	<ul style="list-style-type: none"> • Demographic crises • Unemployment of youths that are not prepared for the green economy • Adult education centres for green jobs for re-skilling and up-skilling are not known to general public • Sporadic courses for green jobs • Not well-established partnerships between the schools and the entrepreneurs and businesses in need of green specialists • School programmes are not prepared taking into consideration the requirements of the labour market for green specialists

The interactive segment then consisted of a discussion with participants on the most well-represented VET school with the best practices in green agriculture in Bulgaria in the field of the Green Deal. The Bulgarian team selected the High School for Agrarian technologies from the town of Gotse Delchev that integrates environmental sustainability in their VET practices and prepares learners who acquire basic skills in:

- Eco products growing on an own area of 30 hectares
- Assembling, repairing and driving electro tractors, minibuses and cars
- Building elector hubs for charging electro vehicles
- Marketing and selling bio vegetables and fruit to the local community

The winning project was 2018-1-BG01-KA102-047023, where VET teachers visits and students' apprenticeships were conducted in well-established agricultural farms for organic farming in the region of Seville, Spain.

The project results were as follows:

- In-depth knowledge of the practical implementation of EU regulations on organic production of plant and livestock production and certification requirements for organic production.
- **Acquired competencies in:**
 1. Principles and methods in organic vegetable growing and fruit growing and cultivation of ecological oil plants
 2. Preparing organic fertilizer and applying methods of plant protection and pest control in an ecological way.
 3. Preparing organic feed for livestock and application of methods for disease prevention among animals in an ecological way.
 4. Methods of organic plant and animal husbandry using aquaponics methods - a hybrid system that combines organic farming, hydroponics and recirculating aquaculture systems

To conclude, all participants agreed that climate change is an important issue that impacts life. There is an existing need for the redefinition or reform of Vocational Education and Training curricula and the model for preparing the labour force capabilities to answer the challenges of today's green economy. Teachers and trainers will have to work hand-in-hand with decision-making authorities and with a variety of stakeholders (particularly green businesses, green entrepreneurs and farmers) to implement changes in line with the green transition. The dual educational system is an example of the connection between educational institutions and the labour market, and students should be encouraged to undergo green apprenticeships in European countries. Young people should be encouraged to use their creativity to co-create or develop green training programmes with educators and other relevant stakeholders. A work-based, project-based and participatory approach should be implemented at all levels of green workers' preparation. Finally, student councils and parliaments should be involved in all matters that directly affect them, and this means having a seat at

the decision-making table and being respected as an equal stakeholder for the green courses' preparation.

2.1.4 Supportive Ecosystem Workshop

The supportive ecosystem workshop was led and facilitated by the project partners from Spain, Femxa Formación S.L.U., and Italy, Lascò Srl.

Over the two days of the implementation of the Virtual Knowledge Fair, the Supportive Ecosystem workshop was structured around two main pillars:

- I. the **mapping** of the actual and potential ecosystem of Vocational Education and Training providers.
- II. the **exchange** and **collaborative analysis** of **best practices** of ecosystemic approaches in Education and Training identified by the members of the project consortium.

On the first day of the Fair, participants were invited to co-develop a *VET Ecosystem Map* (see figure 2 for the template), supported by Google Jamboard. Particularly, the Map included the following components:

- the **key stakeholders** who have an interest in quality and innovation in VET.
- the **challenges** to engaging such stakeholders in long-term cooperation.
- the **activities** to overcome the identified challenges.
- the **value** at the core of the ecosystem.

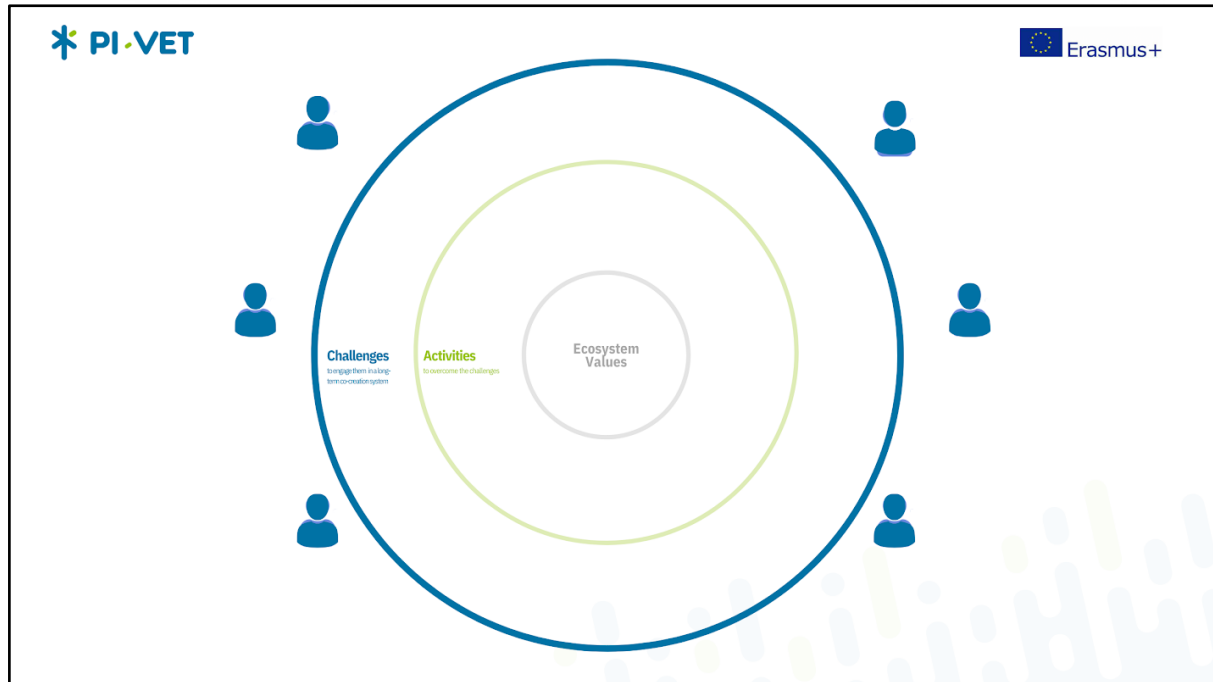


Figure 2 Ecosystem Map Template

The following table collects the results of the workshop (see figure 3 for the results of the ecosystem map).

KEY STAKEHOLDERS

The key stakeholders identified during the workshop can be categorized into four main categories: education, non-profit, public bodies, and social partners and business.

Category	Stakeholders
Education	<ul style="list-style-type: none"> • VET providers; • Higher Education Institutions; • Research Institutions; • High Schools.
Non-profit	<ul style="list-style-type: none"> • Foundations; • Non-governmental organisations;

- Community groups.
- Public bodies
- Government, relevant public institutions and policymakers in VET.
- Social partners and business
- Employment agencies;
 - Career guidance organisations;
 - Companies.

CHALLENGES

Category	Key challenges
Education	<ul style="list-style-type: none"> • Lack of information to students. • Making technology accessible to all. • Design of tailored pathways and methodologies.
Non-profit	<ul style="list-style-type: none"> • Alignment to new initiatives in VET.
Public bodies	<ul style="list-style-type: none"> • “Not-forward-thinking”.
Social partners and business	<ul style="list-style-type: none"> • Old-fashioned structures; • Communication; • Scheduling of long-term joint cooperation.

ACTIONS

The overall proposed approaches and activities to overcome the identified challenges can be grouped as follows:

- Communication;
- Fostering international cooperation and European values.
- Addressing new directives to promote and foster digitalization of VET.
- Funds to modernise facilities;
- Alliances for cooperation.

ECOSYSTEM VALUES

- **Equity** and **equal involvement** of all the parties.
- **Collaboration** and creation of **synergies**.



Figure 3 Results of the Ecosystem Map

On the second day of the Fair, the participants analysed collaboratively five best practices of ecosystemic approaches in Education and Training identified by the project partners. Particularly, the following practices were shared by the workshop’s facilitators and collaboratively analysed:

Troodos Hospitality Academy

Author(s) Troodos Network & Mesoyios Education Group

Description The Troodos Network, an NGO promoting development in the region of Troodos mountains in Cyprus, in cooperation with Mesoyios Education Group, has established an innovative education centre, focusing on teaching, research and contribution to society:

the Troodos Hospitality Academy, co-funded by the Erasmus+ Programme of the EU. The Academy will be offering training programmes for the hospitality sector in response to rural labour shortages, and as a measure against rural depopulation (particularly of young people) as prospective learners will have a chance to study for free, gain work experience and secure a job on completion of their studies. Learners will be trained as waiters, bartenders, hotel housekeepers, receptionists, assistant cooks, and assistant pastry chefs. Hotels and restaurants will provide scholarships to learners, covering tuition costs, monthly allowance, accommodation, subsistence costs and medical coverage contributions, and will pay their salary during their internship. The programmes have a hybrid format and comprise learning in classrooms and practical training at the enterprise which is sponsoring a scholarship.

Website <http://lovetroodos.com/>

4Returns

Author(s) ENABLE Project Consortium

Description The European Network for the Advancement of Business and Landscape Education (ENABLE) has established a European education platform to create awareness about the functioning of ecosystems and the benefits of sustainable landscape management that involves renowned academic partners, private business, public sectors and NGOs in developing innovative and high-quality education. This education aims at bridging the gap and help tackle global challenges as defined in the UN's SDGs and the in the EU 6th Environment Action Programme (Decision No 1600/2002/EC), and the EU Biodiversity Strategy 2020.

Website <https://4returns.commonland.com/getting-started/>

EMPUBLIC

Author(s) EMPUBLIC Project Consortium

Description EMPUBLIC, coordinated by SOFORM, is a good practice of Strategic Partnership funded under Erasmus+ in 2016. The project united 10 partners, including public, educational and social research bodies, as well as local development associations from Italy, Slovenia and Spain, providing them with the opportunity to create and experiment shared models to enhance the goods and services available to public bodies and communities, in order to make them a place for training, job placement and self-entrepreneurship.

Website <https://erasmus-plus.ec.europa.eu/projects/search/details/2016-1-IT01-KA202-005410>

VET4ALL

Author(s) VET4ALL Project Consortium

Description VET4ALL, co-funded by Erasmus+ and coordinated by Profesionalna gimnaziya po turizam "D-r Vasil Beron" (BG), aimed at developing flexible pathways to connect the VET formal school curriculum to WBL for students with disabilities/special needs, foster the implementation of ECVET principles and tools and develop an innovative approach to Mobility in order to facilitate the access for students with disabilities/special needs and support enterprise trainers/mentors and staff during the WBL/internship experience of students with disabilities/special needs. The consortium produced Didactical Guidelines and a Training Curriculum for VET staff, an in-company Mentors Vademecum and a Mobility Vademecum for accompanying persons of students with disabilities/special needs.

Website <https://erasmus-plus.ec.europa.eu/projects/eplus-project-details#project/2018-1-BG01-KA202-047863>

Green Business Programme & 'Green Manager Programme' for the Irish Hospitality Sector

Author(s) Kildare Wicklow Education Training Board

Description	<p>A collaboration was led by Kildare Wicklow Education Training Board (KWETB) out of its Recognition of Prior Learning (RPL) for the Irish Hospitality Industry. KWETB identified skills gaps such as lack of career progression pathways for supervisory and management roles within the sector as well as a lack of knowledge and actions to address sustainability. This collaboration with SOLAS (an agency of the Department of Further and Higher Education, Research, Innovation and Science in Ireland), led to the national roll out of ‘Developing Leaders in Hospitality Programmes’ launched by Irish Further and Higher Education, Research, Innovation and Science Minister, Simon Harris (February 2021). Addressing the sustainability and carbon emission reduction skills gap required an action led approach to develop a more carbon conscious sector and workforce, supported by Fifty Shades Greener (FSG) - a leading environmental education company – who offered an industry specific Green Business and Green Manager programme. This flexible programme with innovative content facilitated a self-directed online programme and a blended model of delivery to address the identified skills gaps and to support the developing Leaders in the Hospitality Programme.</p>
Website	<p>https://www.gov.ie/en/press-release/4a4ea-ministers-harris-and-collins-announce-new-skills-programmes-to-support-hospitality-and-tourism-sector-prepare-for-reopening/</p>

The following section will now discuss the online survey which was used to gather additional data in support of the development of the methodological framework.

2.2 Online Survey

The purpose of the online survey was to gather data which would support the development of the methodology. The Work Package leader, Technological University of the Shannon (TUS), worked collaboratively with the PI-VET partner organisations to develop the online survey. The survey was addressed to Vocational Education and Training teachers, trainers, mentors and coaches that participated in the Virtual Knowledge Fair, in addition to those who did not. This activity included two sub tasks: T4.2.1 Survey Design and T4.2.2 Survey Setup.

2.2.1 Preliminary Work

The survey design task (T.4.2.1) was commenced with the partners completing an initial analysis activity (Activity 1). The purpose of the initial analysis was to guide the process for the formation of official survey questions. This involved the gathering of secondary data specific to three areas of focus: national level, vocational education and training sector and students. Each PI-VET partner undertook this research to provide an overview of the perspective in their country.

The insights have been highlighted in the following sections.

National Level (Initial Analysis)

National trends throughout the countries suggested good employability, progress, and a need for digitalisation and digital technology in the education and job sectors. Digitalisation is a high priority for the countries, which has been accelerated due to the global pandemic. Green practices are implemented at national level, with further plans to improve in the future. Initiatives in all countries are being generated to promote environmentally friendly jobs and environmental training. Overall, there is a great demand across the partner countries for sustainable skills and knowledge. This places emphasis on the education sector and various external stakeholders to work collaboratively to supply the labour market in line with sustainable transformation and the competencies needed for the future of work.

Please refer to the below table for a brief summary.

National Level	
<p>What does the job market look like in terms of demographics in your country? Are there any special efforts made to encourage inclusivity?</p>	<p>Tourism accounts for the most significant part of Cyprus' GDP. Cyprus joining the EU in 2004 has led to multi-national company investment, resulting in gradual job vacancy increases. In Spain, of the 47 million, 23 million are active population, and of these, 20 million are employed. In terms of GDP, Spain is the 15th largest global. In Ireland, the unemployment rate as of February 2022 was 5.2% (quite low). Diversity and inclusivity efforts are vital for the sustainability of Irish businesses and the economy.</p>
<p>What national trends in digitalisation/digital technology are affecting a) the education sector & b) the job market in your country?</p>	<p>In Cyprus, education has become more digitalised, with teachers and students using online platforms for classes and information storage. In Spain, digital inclusion is aimed at the whole population, particularly in the context of the gender gap. The Covid pandemic has emphasised the need for digitalised education for all. In Ireland, the coronavirus pandemic has led to a shift in digitalised technology using hybrid learning models. Digital skills will be particularly necessary for the Irish built environment in the field of Net Zero Energy Buildings and the Circular Economy. Demands for skills in the ICT sector continue to be significant and more initiatives are being put in place to support people to undertake studies in ICT. Regional initiatives such as the Explore and DigiEco programmes in the Midwest work with Micro Enterprises to introduce digital tools. In Bulgaria, the pandemic has allowed trainers and learners to work together. The Bulgarian labour market, however, has not been successfully digitalised.</p>
<p>What green practices are currently being implemented across 1)</p>	<p>In Cyprus, educational curriculums have promoted green practices and ecological mindsets. Schools are equipped with recycling bins, and students take part</p>

<p>the education sector and 2) the job market?</p>	<p>in cleaning activities locally. In Spain, green education sector practices include widespread policies of reducing, reusing and recycling. The use of digitalisation, such as email and USB memory storage, helps reduce paper use. There is an increase in green marketing and raising public awareness of sustainable practices in the job market. In Ireland, green practices include Green Schools (where teachers and students work collaboratively in exercising green practices to receive a green flag for their school) and education for Sustainable National Strategy. Green practices in the job market include the Green Employment Initiative, this ensures Ireland expands in areas that can generate green jobs. In Bulgaria, they introduced environmental education standards for environmental Educa and acquired an ecological culture and awareness using formal and informal teaching methods.</p>
<p>An ecosystem can be defined as “a complex network or interconnecting system.” It considers how living (people) and non-living things interact as a system within their environment.</p> <p>In the education sector context, collaboration is key to creating supportive ecosystems. Are there any specific</p>	<p>In Cyprus, UNESCO and non-governmental organisations many times cooperate with the ministry of education as well as individual schools to promote best practices in education and to provide information about important matters such as environmental issues and mental health. In Spain, The State School Council is the body for the participation of the sectors most directly related to the world of education in Spain. It was created with the Organic Law regulating the right to education in 1985. Its scope extends to the whole of Spain. The Council also carries out consultative, advisory and proposal work for the Government in relation to the different aspects of the education system. The State School Council has 107 members. In Ireland, the collaborative approach between a variety of stakeholders is a key component in driving change.</p>

<p>practices in your country which involve different stakeholders in planning/decision making of how education is carried out/structured?</p> <p>What sort of stakeholders are involved in this process?</p>	<p>In the context of education, this is particularly evident at tertiary level education with many colleges, universities, and technological universities involved in a variety of regional, national and even international projects (e.g., Erasmus+, HORIZON 2020, INTERREG EUROPE). Stakeholders involved in project collaborations vary depending on projects, however, may include government bodies, NGO's, SME's, private sector, regional or national representative bodies, general public, educators, researchers etc. In Bulgaria, a mechanism for joint work of the institutions for prevention of dropping out of students from the educational system is being implemented. A national coordination unit had been set up including the Minister of education, Minister of Health, the Minister of Regional Development and all public stakeholders.</p>
<p>What sectors are currently reporting a demand for persons with sustainable skills/knowledge?</p> <p>What are sustainable skills currently in demand?</p>	<p>In Cyprus, all sectors that are relevant to design of technology and use of digital tools. Sustainable skills in using technology to limit environmental impact are in demand. In Spain, demand for jobs is expected to grow across sustainable innovation, environmental protection, waste management, renewable energies, sustainable logistics, eco-design and environmental education. In Ireland, sectors reporting such demand include ICT, construction, tourism and hospitality, retail, logistics and transport. Skills in demand include information literacy, data analytics, online content creation, ICT, electronic and electrical engineering, robotics, animation, green tech, cybersecurity, augmented and virtual reality etc. In Bulgaria, all sectors of the economy need people with sustainable skills. The highest demand is in the high-tech sectors.</p>

Vocational Education and Training Sector (Initial Analysis)

At a glance there are some existing efforts made to facilitate a more inclusive environment for Vocational Education and Training teachers/trainers across the partner countries, however there is still room for improvement in this area. The digitalisation of teaching and learning practices in Vocational Education and Training is evident in countries like Spain and Ireland, with emphasis being placed on online and e-learning technologies, gamification and digital communication tools. This differs in Bulgaria, where digitalisation is not up to date in all schools, particularly those in rural areas. Finally, green practices are growing in importance in Vocational Education and Training across the partner countries, however there is still a lot of room for improvement.

Vocational Education and Training Sector	
<p>What efforts are currently being made to facilitate a more inclusive environment for VET trainers/teachers?</p> <p>What aspects do you think to require improvement?</p>	<p>In Cyprus, the Human Resource Development Authority's training activities include a scheme to improve the employability of the unemployed, upskilling unemployed persons, training programmes for newly employed graduates and job placements for unemployed persons. Best practices for inclusion of VET trainers/ teachers need to be enhanced, and there needs to be more opportunities to enter the labour market and earn respectable salaries. In Spain, requirements for trainers/instructors depend on the type of training to be provided. Training linked to the national catalogue of occupational standards (CNCP) sets the academic and teaching qualifications and experience that trainers must meet for each training module. Otherwise, requirements for trainers are set in terms of qualifications, professional experience and teaching competence. Continuing professional development (CPD) is a right and a professional duty. However, Spain needs to focus on the modernisation and flexibilization of its education system. In Ireland,</p>

	<p>after Teaching in FET was included in professional teaching routes, eight Irish higher education institutions created postgraduate & undergraduate qualifications for Initial Teacher Education in FET under Route 3, forming a forum of HEIs from across the State who are committed to developing and recognising FET in its own right (heifetforumireland.ie). In Bulgaria, inclusion is realised through access to the physical environment, access to information, acceptance in the community and compilation of textbooks by students with differing abilities.</p>
<p>What technologies are VETs availing of in line with digital transformation to enhance teaching & learning?</p>	<p>In Spain, VET centres are providing their teachers with training aimed at the acquisition and implementation of digital competences. This enables them to teach online courses through the Moodle platform, create training courses that include gamification tools or the use of platforms to communicate directly with their students as well as to record their progress. In Ireland, VET avail of online and e-learning technologies. These include innovative platforms/hubs for self-learning. New access route enabling Skills to Advance learners to access eCollege through ETBs is now in place. In Bulgaria, digitalization is not up to date in all schools especially in small rural schools which are not supplied with all necessary equipment. The main problem is the lack of well-qualified specialists who will help this transition in the education system.</p>
<p>What green practices are exercised by VETs in your country? What do you think VETs can do to improve?</p>	<p>In Cyprus, VETs have to follow practices that do not harm the environment. There is an effort to use tools and resources responsibly and to use alternatives or digital resources that prevent the excessive use of primary resources to the expense of the ecosystem, however there is room for improvement. In Spain, VET</p>

	<p>programmes have not traditionally included green practices related to sustainability, energy efficiency and renewable energies; in many cases teachers and trainers lack formal qualification to actively and sustainably participate in and contribute to the green transition. However, many green practices have recently begun to be implemented in VET centres. In Ireland, Minister for Further and Higher Education, Research, Innovation and Science Simon Harris TD opened the first-ever FET Green Skills Summit which took place in Wexford County Hall in March 2022 (organised by SOLAS, ETBI & Waterford Wexford ETB). The summit was presented with an update across green skills for construction, careers and life. In Bulgaria, programmes for ecological and health education at school are determined by state standards, interactive teaching methods, developed teaching resources, implemented innovations and share of good practices.</p>
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Student Perspective (Initial Analysis)

Overall, the Vocational Education and Training sectors across partner countries seem to hold a high regard for inclusion in the student perspective, ensuring various supports are in place to provide any learner (regardless of background, disability, former education etc.) with an opportunity to learn or develop. Despite this, emphasis needs to be placed on ongoing training to better equip educators or trainers in inclusive practices to better accommodate people of diverse learning needs. There has been a mixed view across the countries in terms of adequate access for participation in digital learning environments. While digital learning environments and online digital resources are available for student use, there are a few limitations to accessing such (e.g., lack of advanced digital skills to be able to access them, or lack of digital resources for disadvantaged groups). In terms of the green perspective across the countries, students are being actively involved in green practices supported by Vocational Education and Training institutions.

Some recommendations suggested for greater environmental commitment from students include increased school initiatives, actively involving students in practical actions that promote sustainable living and giving them the opportunity to become ambassadors and leaders in promoting green practices. Finally, there are various practices across Cyprus, Spain, Ireland and Bulgaria that facilitate the transition from education to the working environment. These include work experience, internships, apprenticeships, traineeships, supporting initiatives (Skills to Advance, Back to Education) and collaboration between educational providers and employers.

Student Perspective	
<p>What are VET providers doing to ensure VET education is more inclusive and approachable for different types of learners? (Please keep in mind SEN, learners/trainers of disadvantaged backgrounds etc.)</p> <p>What improvements could be incorporated from a pedagogical point of view?</p>	<p>In Cyprus, the Centre for the vocational rehabilitation of the disabled (30) provides specialised programmes to promote the acquisition of professional skills by disabled persons, which are promoted by the MLSI. The Social welfare services (31) have launched the project 'Work and social activation of people in vulnerable groups through the development of social skills and other actions', co-financed by the ESF in the programming period 2007-13. From a pedagogical point of view VET providers could be better trained and equipped in their practice and approach towards people of diverse learning needs. In Spain, moving towards a more inclusive education system is one of the priorities of VET centres. However, guaranteeing the presence, participation and learning of each and every student has become a major challenge. From a pedagogical point of view, the teaching methodology provided must be adapted. In Ireland, inclusion and community development have always been central to the work of ETBs and FET providers. FET balances the needs for skills for work with the critical skills needed for life by supporting citizenship and prosperity across communities and developing social capital. FETs</p>

	<p>ensure that supports are available to allow any individual regardless of background or formal education, to have an opportunity to learn and develop. In Bulgaria, they admit and train a variety of learners across the SEN spectrum, offer qualifications for teachers specific to SEN work, create a physical environment for children with SEN and apply adequate educational methods and training resources.</p>
<p>Do you think that VET students have adequate access and the required knowledge for participation in digital learning environments?</p>	<p>In Cyprus, although there has been an improvement in the education VET students are provided with, there is still room for improvement in terms of the facilities and the digital learning environments available to them. In Spain, there is a general lack of advanced digital skills among VET students to participate in online learning processes. In terms of older students, some difficulty has been detected in adapting to the virtual context, precisely because of the lack of specific training in this area. In Ireland, some VET students will have adequate access and knowledge as much of society has become more digitalised. However, this is an area which will require more attention in considering students who are not as tech savvy or those that belong to disadvantaged groups in terms of accessibility to digital technologies. In Bulgaria, there are a variety of online resources available such as platforms where educators teach online or for free, digitised textbooks and teaching materials.</p>
<p>How are students involved in the green practices currently supported by VETs in your country?</p>	<p>In Cyprus, students are regularly provided with seminars on how to carry out their practices in ways that do not harm the environment. A greater environmental commitment can be obtained from students by actively involving them in actions that promote a sustainable way of living. In Spain, students</p>

<p>How do you think a greater environmental commitment can be obtained from students?</p>	<p>have the opportunity to participate in training courses that provide them with training content subject to the green transition and reducing human impact on the environment by promoting environmentally friendly practices. Greater environmental commitment from students can be achieved by actively involving them in practical actions that promote sustainable living, giving them the opportunity to become ambassadors and leaders in promoting green practices. In Ireland, there are a few green practices supported by VETs across the country which involve students (directly or indirectly). Gurteen Agricultural College is an excellent example of promoting green practices. Renewable energy has been emphasised at the college and the technologies used include willow, wood fuels, wind turbine, LED lighting, heat exchangers and photovoltaic panels on rooves which significantly reduce the College's carbon footprint and running costs. In Bulgaria, students participate in green initiatives organized at national, regional, municipal and school level, as well as initiate such in the field of student self-government and volunteering. Students also participate in green Erasmus + projects. Greater environmental commitment from students can be achieved by increasing school initiative and involving stakeholders in these green initiatives.</p>
<p>What supports are available to accommodate learning for all types of students? Is there any specific/additional VET teachers/trainers</p>	<p>In Cyprus, almost all public schools include special education teachers who are trained to support students with special needs. VET education efforts have been made to make their practices more inclusive, however a lot of work still needs to be done before one can say that VET teachers/ trainers are well trained and knowledgeable to accommodate all types of students irrespective of their learning needs. In</p>

<p>training to facilitate these students?</p>	<p>Spain, the path towards educational inclusion must involve a cultural change that requires planning, encouragement and continuous evaluation. Therefore, it is clear that it is necessary to deepen teacher training for inclusive education, emphasizing training for a new role, both for the tutor and the support teacher, to be able to carry out appropriate strategies for school improvement and maintaining the motivation of each student. In Ireland, to enable the expertise and commitment of VET a keen focus on professional development is required. Management and leadership, digital transformation, quality assurance and programme development are critical areas requiring some development. The VET learner base is incredibly diverse, and VET must encourage and reflect this diversity in the way in which it supports learners and offers them clear pathways. In Bulgaria, in addition to pedagogical staff, a psychologist is appointed in each educational institution; resource teachers and speech therapists are also provided by the regional centres for special educational support according to the specific needs. The teacher's assistant, social worker and resource teacher provide additional support, together with the regular subject teacher. Specialized trainings are organized for teachers who are not trained to teach children with disabilities.</p>
<p>What are VETs doing to facilitate the transition from education to the working environment?</p>	<p>In Cyprus, VET students are usually sent to different employers where they are given the opportunity to practice what they have been training on and improve their experience in the field. This can be in the form of internships or short term 'placements', in which schools collaborate with different employers in the job market with relevant expertise to the ones that VET</p>

	<p>students are training in. In Spain, VET is permanently responding to the demands of labour market, adapting its theoretical and practical training of students to the economic and social reality. Workers with vocational training degrees are particularly valued by companies. Internships called Workplace Training and Dual Vocational Training projects increase the chances of job placement of vocational training graduates in the same company once the training is completed. In Ireland, there is a variety of examples in facilitating this transition; ranging from Apprenticeships & Traineeships, Skills to Advance initiative (upskilling for workers in jobs undergoing change or in vulnerable sectors), and Back to Education initiative (part-time education programmes for those looking to return to learning with work, family etc.). Finally in Bulgaria, vocational dual education achieves the connection with the employers by internships in enterprises. The activities are promoted by publicly announcing the institutions performing VET and the professions and specialties offered by them.</p>
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2.2.2 Survey Design

This section is concerned with the activities involved in the survey design.

The survey structure was planned to include an introductory/ethics text, a consent question, the actual questions split into three sections (between 15-20 that should take approximately 5-10 minutes to complete), and the concluding text with thanks for participation.

The next activity in the design process focused on question formation for the survey. Findings from the initial analysis were used as a supporting basis for question development. This led to the creation of 12 questions (forming the main

section of the survey), which aimed to investigate the elements that any course or program should include to be inclusive, digital, green and supported by multi-stakeholder and cross-sectoral partnerships. Since the survey was aimed at Vocational Education and Training teachers, trainers, mentors and coaches that participated in the Virtual Knowledge Fair, the first section of the survey focused on questions specific to feedback on the event. The final section of the survey contained questions specific to gathering contact information for future events. In total, the survey consisted of 17 questions.

Ethics Consideration

Ethics were widely considered in the design process as various codes of conduct have been created over the past few years to protect the rights of research participants.

Some examples include:

- The Nuremberg Code of ethics (1947) which emphasises voluntary consent of participants, assessment of risks and benefits, and assurance of competent investigators (Moreno, Schmidt & Joffe, 2017)
- Declaration of Helsinki (1964) (Malik & Foster, 2016; Skierka & Michels, 2018)
- European Union's General Data Protection Regulation (GDPR): privacy and security of personal data in automated/electronic means (The European Parliament & The Council of The European Union, 2016)

These codes of conduct highlight the researcher's responsibility to:

- Protect the rights of participants, ensuring that they are respected while participating in the research and to ensure beneficence (maximise possible benefits and minimise possible risks) (Yip, Han & Sng, 2016)
- Explain the nature of the study to the participants, assuring anonymity and confidentiality, explaining the rights of the participant, and obtaining voluntary consent

2.2.3 Survey Set Up

This section discusses the activities involved in the survey set up and launch.

The survey was set up using Google Forms, where responses were automatically collected upon submission. The sample goal for surveys was 200 responses, which can be considered a viable size for depicting accurate results. This argument is supported by various research sources, which state that a minimum sample size of 100 should be sufficient in deriving accurate results using questionnaires/surveys (Anthoine, Moret, Regnault, Sébille & Hardouin, 2014; Louangrath, 2017; Conroy, 2018).

Prior to sharing the surveys with prospective participants, it was tested by conducting a pilot study. The purpose of the pilot study was to:

- Trial and validate the effectiveness of the survey (ease of use etc.)
- Contribute to the improvement in quality or the efficiency of survey
- Neutralise possible frustrations post-distribution (better response rates)
- Eliminate any fundamental issues that could be critical to the reliability of the data collected (e.g., respondent not understanding a question due to poor construct)

Generally, sources suggest a sample of 12 for testing as a rule of thumb, however viability may be tested with a sample size as low as 10 (*Sim & Lewis, 2011; Bell, Whitehead & Julious, 2018*).

The surveys were then distributed by the PI-VET partners online, targeting Vocational Education and Training teachers, trainers, mentors and coaches across Bulgaria, Spain, Italy, Cyprus and Ireland. The surveys were shared with participants from the last week of May until the 25th of August (three months duration). Should surveys be carried out again, it is recommended that such commence earlier and sufficient data collecting time is allocated. There was a delay in closing the surveys as many Vocational Education and Training educators or trainers finished up over the summer months which posed a challenge in gathering responses. Another challenge which arose during data collection related to a language barrier. Some prospective participants across the participating countries had difficulty understanding the questions or answering in English so the survey had to be translated.

2.2.4 Survey Analysis

This section presents, interprets, and evaluates the data collected through the online survey to draw key conclusions which will support the development of the methodological framework for sustainable learning programme. This focuses on the analytical approach to present the main findings of both quantitative and qualitative data based on survey responses gathered from 200 Vocational Education and Training teachers, trainers, mentors and coaches. All 200 respondents consented to participation in the survey.

The ensuing section will commence by presenting, analysing, and evaluating data specific to the virtual knowledge fair feedback.

Virtual Knowledge Fair Feedback

The first question asked the participants if they had attended the PI-VET virtual knowledge fair on either the 18th or 19th of May. This question received a 100% response rate, with the majority of respondents stating no at 71%. This means that of 200 respondents participating in the online survey, approximately 29%, attended the event (see figure 4).

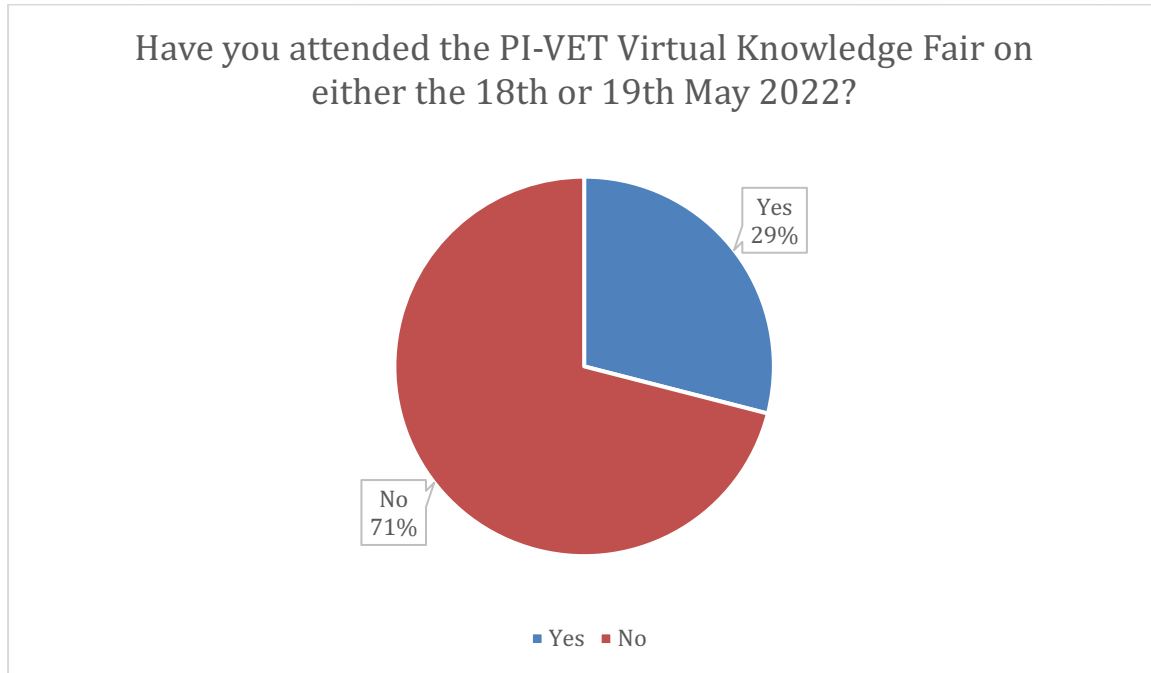


Figure 4 PI-VET Virtual Knowledge Fair Attendance

The next question was specific to those that had attended the PI-VET virtual knowledge fair only. The participants were asked to rank their experience at the virtual knowledge fair out of 5; where 1 meant a poor experience and 5 meant an excellent experience. This question only received a 71% response rate from those that attended the fair. Majority of participants (some 58% of respondents) stated that their experience was excellent, followed by approximately 32% stating that it was good, and the remaining 10% rating their experience as average (see figure 5). This indicates a very positive outcome and suggests that the educators must have found the two-day event beneficial.



Figure 5 Event Experience

The final question in relation to the virtual knowledge fair asked those who had attended the fair if they had any suggestions on how the PI-VET team could improve their experience at future online events. This question received a 91% response rate. Majority of respondents, some 13%, did not have any official suggestions for the PI-VET team, however they did give positive feedback that the event was interesting and well organised. Approximately 11% of respondents suggested more time for the event. The next most significant suggestions related to the event dissemination / marketing, wherein some 9% of respondents suggested to have better awareness of the event, to be informed in a timelier manner. This indicates that the PI-VET consortium should take more care in raising awareness of any future events and notify participants at least a month in advance. The table below contains a full summary of all suggestions.

Suggestions

- No suggestions, the event was interesting and well organised [x7]
- By trying to show an effective interest in the real learning needs of the target audience
- Creating specialised VET in Renewable Energies

- Easier access for seniors
- Explain the objectives better
- More detailed preliminary programme
- More interaction [x2]
- Have a national event (in the language of the country) first
- Better not to have the fair on two consecutive days. Have it in the afternoon where most teachers don't have the pressure of schoolwork
- Mix events / blended events [x2]
- More facilitators
- More information and dissemination
- More time [x6]
- Involve more participants [2]
- Send timely notification for participation / to be informed earlier about the event / better awareness of event [x4]
- The implementation in-person would be interesting
- There were some minor technical issues
- Language Barrier [x2]
- We were in a group that had a translator to help us understand the speakers [x2]
- Ensure quality translation

The following section will now present, analyse, and evaluate data which will support the development of the methodology for sustainable learning programmes

Sustainable Learning Programmes Insights

The first question of this section asked the participants to select their country of residence. This question received a 100% response rate, consisting of all 200 responses. Majority of survey participants came from Spain (at 28%), followed by Italy (at 25%), Ireland (at 19%), and Bulgaria (18%). The remaining survey participants came from Cyprus (at 9%) and even Northern Ireland (1% - see figure 6).

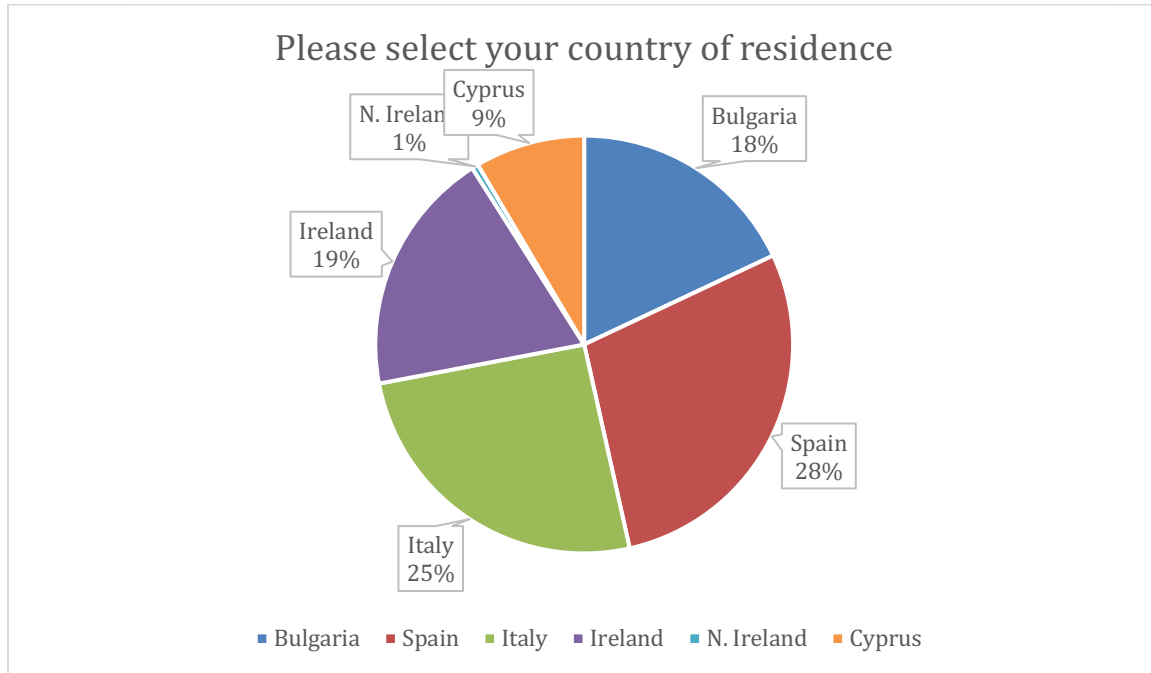


Figure 6 Country of Residence

The second question of this section asked the respondents if they thought that there was a clear and recognisable teaching pathway for Vocational education and Training teachers/trainers/mentors or coaches in their country. This question received a 100% response rate with mix opinions. Some 43% of respondents stated no, compared to approximately 29% who stated yes, and 7% were not sure. The remainder of respondents did not give an indication of a specific stance on the matter. Some of the most common arguments for those who stated “no” were that VET training is not well defined, there is a lack of clarity on the matter, there are many possibilities to become a VET teacher/trainer; it is up to the individual, there is a need for refresher courses, and there are too many changes or laws to follow making it very confusing. The main reasons suggested for the respondents who answered “yes” were that there are existing structures in place, there are many policy documents and guidelines available, the pathway will vary based on the subject matter and level. Overall, this indicates a strong need for reform and clarity in the VET teaching perspective, as both sides of the argument suggest room for improvement. The table below contains a snippet of answers.

Additional Information

- It is very difficult to recruit young VET teachers because of the low salaries
- A lot of work is still required to create a solid frame of reference when it comes to VET education.
- There is a lot of emphasis on VET trainers but I believe more can be done.
- I think trainers are working more independently and finding their own teaching techniques.
- In Cyprus there are no specific legislations by the Ministry of Education and VET training as a field is not well defined.
- There are many NGOs who are trying to develop learning materials and strategies
- There is no specific framework
- I am not too sure on what constitutes a VET teacher as opposed to a FET teacher. Therefore, I will answer all questions as a FET teacher
- For mentor and coaches there isn't a clear pathway
- Staffing structures of Colleges and Training Centres need to be integrated to show clear pathways for staff.
- There are many avenues and possibilities for entering a teaching career in VET in Ireland.
- It is very difficult to find refresher courses and new ways of teaching courses
- I think they have a good teaching pathway but it could be improved
- I am not sure if it exists in a formal and official way as such
- It is outdated and does not meet the real needs of learners.
- I think that the contents, time and criteria are often not carried out by people who are experts in the subject and therefore they are not properly trained. In addition, teachers are underpaid for the workload and time they have to spend.
- Moderately. The constant legislative changes, the variations between centres and the lack of control over teaching practice make it difficult to determine the situation, which depends more on the teacher + educational centre variable.

- I think the VET supply in Italy is too heterogeneous to accurately respond to this question. In my perspective, as a professional trainer in Marketing and Communication, I don't believe there is a clear pathway.
- There are training courses for young teachers, but sometimes I think they are not enough to prepare a future teacher who will have whole classes of students in front of them.
- I don't think it is clear and recognizable enough. I don't have much information about it.
- I think it depends on the specific vocational teaching field.
- The National guidelines provide an overall reference structure for the Vocational Education programs.
- Many policy documents and guidelines, but not directly applicable. There is a path, but not clear and recognizable.
- There are guidelines and reference models, but there is wide flexibility in training provision.
- Existing guidelines are not enough to make the teachers' teaching path "clear and recognizable."

The third question asked the respondents to rate the current training that VET teachers/trainers/mentors or coaches receive to facilitate inclusive, digital, green and supportive ecosystem practices. This question received a 90% response rate. In terms of training specific to inclusive practices, there were mixed opinion. Majority of respondents rated the current training as average (at 36%), with approximately 33% rating it favourably and 31% rating it unfavourably. Similarly, in addressing training specific to digital practices, majority of respondents rated it as average (at 44%), followed by 33% of respondents rating it favourably, and the remaining 23% rating it unfavourably. The results however differed in terms of training specific to green practices; wherein majority of respondents (some 41%) rated it as unfavourable. Some 35% of respondents rated the existing training as average, and the remaining 24% as favourable. Likewise, majority of respondents rated the current training received for supportive ecosystems practices unfavourably at 48%, followed by average at 33% and remaining 19% as favourable. These results suggests that there is room for improvement in the existing training that VET trainers receive specific to inclusive and digital practices; but most

importantly in relation to green and supportive ecosystem practices where the outcome has been quite poor. For a full summary of results please see the table below.

	Poor	Unsatisfactory	Average	Satisfactory	Very Satisfactory
Inclusion	16%	15%	36%	23%	10%
Digitalisation	10%	13%	44%	24%	9%
Green Practices	19%	22%	35%	16%	8%
Supportive Ecosystems	29%	19%	33%	12%	7%

The fourth question asked the participants for their opinion on what can be done to improve VET education to be more inclusive, green, digital, in line with market needs and to facilitate supportive ecosystems. This question received a 99% response rate. The most significant suggestions related to more training for educators (at 17%), followed by more practical application (at 10%), more collaboration (8%), more tools / resources / time (6%), increased investment (5%) and continuous online education, training or workshops (approximately 5%). The table below contains a summary of other suggestions.

Suggestions
<ul style="list-style-type: none"> • Update the curricula [x6] • More motivation using active teaching methodologies, like photo voicing. • Accessibility • Achievable goals • Adapt it to the real needs of heterogeneous learners • [Innovative] collaboration between stakeholders / better relationships [x15] • Multidisciplinary approach to sustainable development in curricula development • Adopting innovative approaches like the Collective Impact approach • Guidelines, tools and instruction [x4]

- PUT THE LEARNER, MATERIAL RESOURCES and TRAINED HUMAN RESOURCES AT THE CENTRE OF THE SYSTEM
- Attract the business world to the teaching world
- Awareness and commitment / Awareness of the value of sustainable practices [x5]
- Better infrastructure
- Courses that meet the criteria [x4]
- Continuous online education, attractive free trainings, workshops [x9]
- Create a database of business cases and class activities that could be included in different courses.
- Essential meetings with teachers to try to convey the importance of such [x2]
- Creating a cross institutional and multistakeholder Working Group chaired by the Ministry of Education to address all these challenges
- Creating public-private partnerships and permanent working groups to address all of these issues systemically
- Design integrated strategies / policies
- Develop a state level framework and offer trainings to recognize VET skills
- Experimenting and promoting more effective and innovative models.
- Fostering an innovation culture [x4]
- Greater pedagogy [x2]
- Adjust to the needs of the labour market and economy [x4]
- Training for the educators to be competent in those areas [x33]
- Micro credentials
- Involve students in collaborative decisions [x2]
- Increased investment [x10]
- Motivating teaching staff
- Introduce innovative models such as Fab Labs into training centres, which embrace the concepts of open-source symbiotic economy and circular economy through green entrepreneurship
- More practice [x2]
- More promotion for it to be seen as a viable education pathway
- More research in these areas

- Move to a cross curricular format
- The good-will, practice and knowledge of individual teachers/ centres needs to be matched with organisation-wide policy and directives.
- Participatory and collaborative teaching methodologies, more oriented toward active learning.
- Promoting and testing prototypes of integrated participative activity and organization plans for vocational education and training.
- More tools / resources / time [x11]
- Reducing the rigidity of the formal education system and open it to the external world.
- Setting up open innovation programs into schools.
- Sharing best practices
- Strengthen the relationships between the education system, the world of work and the territory.
- Supporting a paradigm shift from school-centred approaches to community-wide approaches.
- Take into account the opinions of teachers
- There should be a new programme added for VET teachers at the universities
- The practice should be conducted in real conditions / practical application [x19]

The fifth question asked the participants what practices they thought should be implemented in the design of learning programs to meet the needs of diverse groups of learners. This question received a 99% response rate. The most significant recommendations included diversified programmes to meet the needs of different groups (at 11%); accessible e-learning or distance learning (8%); embrace small groups, accessible language, learner centred approach (6%); favour models like the Universal Design for Learning (5%), and analysis of the learner profile and their needs (4%). Other interesting suggestions included collaboration and teamwork, support and flexibility, appropriate training and adapted internships. The table below contains a summary of the remaining suggestions.

Suggestions

- A detailed analysis of the different group of learners should be implemented at the preliminary stages of designing educational programmes
- Abandoning the "one-size-fits-all" teaching strategies, to favour models like the Universal Design for Learning. [x10]
- Analysis of the learner profile and their needs [x8]
- Any additional specific accompaniment programme to develop or strengthen digital competences and academic and work or career guidance.
- Interviews with students to better understand their needs [x2]
- Art, music or game workshops (i.e., all universal languages) [x2]
- Appropriate training [x5]
- Awareness [on the common learning disabilities] [x3]
- Co-creation practices [x3]
- Collaboration and teamwork [x7]
- Cooperative learning strategies [x2]
- Creating differentiated but integrated pathways
- Diversified delivery [x2]
- Diversified programmes to meet the needs of different groups [x21]
- Disadvantaged, unemployed, special education [x2]
- Use of Curricular Enrichment: INVERTED CLASSROOM.
- Embrace small groups, accessible language, learner centred approach [x11]
- Ensure all learners feels welcomed and valued by the school community [x2]
- Ensuring the availability of assistive tech.
- Ensuring the provision of descriptions for audio presentations, images or video for visually and hearing-impaired students / auto translate / text to audio [x2]
- Teacher experience
- Conduct needs analysis and then proceed to designing diverse individual programmes for acquiring the competencies needed for a job.

- Strengthening of soft skills, focus on abilities, rather than disabilities.
- Fostering shared respect, empathy and appreciation of diversities [x3]
- Have an interdisciplinary teaching approach marked by creativity and innovation.
- Support learners from diverse backgrounds with face-to-face communication
- Accessible e-learning or distance learning [x16]
- Educational support software / technology / tools [x4]
- Include team challenges and incentives.
- Include training in project management, agile methodologies, etc.
- Including inclusiveness and accessibility as criteria for choosing digital tools.
- Increase resources
- Support and flexibility [x7]
- Interactive workshops [x3]
- Adapted internships [x5]
- Good digital communication practices
- Involving support teachers/trainers in vocational centres
- Knowledge of successful practices in other environments
- Specialise teachers in Pedagogical and Didactic Methodology and Learning Techniques.
- Make it an eminently practical training.
- Make supplementary aids and services available to learners who need them.
- Motivate students
- Peer to peer mentoring [x2]
- Opportunity for learner feedback
- Practices that support lower performance learners with learning difficulties.
- Pre-training by subject
- Providing alternative assessment methods [x3]
- Real and motivating practices that respond to the needs of the market. [x3]

- Recorded sessions with automatic subtitles to people's native language
- Setting up inclusive working groups
- Structural approach by organizations towards learners
- Cultural awareness [x3]
- Take into account any difficulties or special needs they might have, create adaptable material
- Develop more empathy and respect for the teacher.
- Include opinion of psychologists and therapists in design of learning programme

The sixth question asked the participants for suggestions on what could be done to ease the transition for VET students to the labour market. This question received a 99% response rate. The most significant responses included more practical training (specifically mentioning longer internships and more work experience – 23%), emphasis on strengthening the network between stakeholders (educational institutions and employers) and greater collaboration (9%), and dual training (5%). The table below contains a summary of the remaining suggestions.

Suggestions

- Inform about the specifics of the profession
- Visiting workplaces [x2]
- Meetings with people from the profession
- Career days / Job fairs [x2]
- Preparation of electronic catalogues of the professions
- Funding of scholarships by the state
- Provide career guidance to students
- Dual training [x9]
- Market access jobs when finishing
- Childcare
- Immersing them in the reality of work
- Diversify their skills and abilities
- Strengthening the network between stakeholders & greater collaboration [x17]

- PUTTING THE STUDENT AT THE CENTRE OF THE SYSTEM
- Networking modules
- More practical training – Longer Internships, Work Experience [x45]
- Experiential Workshops [x7]
- Clear and structured pathways
- Mixed training and employment formulas and more resources for teachers
- Mentoring [x2]
- Developing students' transferable skills
- Alternating theoretical teaching and practical activities by favouring laboratory simulations [x2]
- Entrepreneurship and labour related skill development
- Traineeship & apprenticeship opportunities [x5]
- Transferring strategies that students can apply in their personal & professional life [x3]
- Continue to promote and invest in disadvantaged environments
- Individualised help
- Simulated workplaces
- Engaging employers in developing curricula and assessments for learners.
- High quality levels of support for mentors assigned to students
- Teach employability skills [x5]
- Enhancing the personal interests of young people and their vocations.
- Providing career counselling and guidance and fostering job search skills [x2]
- Transferring the culture of work to student.
- Support or guidance in personal and professional growth plans [x4]
- By integrating companies' technical projects within the ordinary training paths.
- On the job training [x2]
- Make the market more attractive, incentivise it [x2]
- Match education / training / skills to labour market needs [x4]
- Post-course / training support and guidance [x2]
- Dedicated work placement teams on campuses

- More information
- Bigger selection of companies
- Pre-training
- Informing companies about the benefits of the training programmes
- Strengthening basic skills provision
- Job orientation
- Fostering students' adaptability and ability to use information and technology.
- Search for jobs in companies with social commitments (compliant with CSR)
- Building a strategy that truly combines education and labour market
- Build capacity of VET providers to develop and adapt curricula to skills foresights and forecasts.
- Computational thinking.
- Adopting more competence-based learning approaches and qualifications.
- More flexible education and training paths (based on learner needs) [x3]
- Bringing them closer to the business reality to meet social needs
- Graduate programmes
- To be more responsive to the needs and demands of companies.
- Encourage work-related values
- Training programmes, exchanges with other countries especially in language courses.
- Minimum number of jobs in each company or workplaces reserved
- Less theory and more practice [x4]
- Promoting active learning experiences and more project-based learning

The seventh question asked the respondents about their opinion on the type of digital tools, technologies and/or software that should be embedded into learning programs. This question also received a 99% response rate. The most significant suggestions included all necessary digital tools / technologies / software relevant to labour market needs (7%), artificial intelligence, augmented reality and virtual reality (7%), and Microsoft office tools and MS Suite (6%). The table below contains a summary of the remaining suggestions.

Suggestions

- File management / Project management tools – Moodle [x9]
- Canva [x3]
- 3D printers or vinyl cutters [x2]
- Algorithms
- Blended learning approach, with MS Teams (or another similar platform)
- All possible and necessary to the labour market [x14]
- Artificial Intelligence, AR and VR [x13]
- Assistive technology for Learners
- Audio books, availability of voice-ware technologies [x2]
- Basic IT skills – typing [x2]
- Better equipment and connections [x2]
- Book creator, thinglink, genially, word wall, mentimeter, assist tech
- Recorded classes
- Cloud computing products
- Communication and data exchange.
- App creation
- Blockchain technology [x3]
- Data visualization, analytics and management tools [x3]
- Latest technologies and software [x5]
- Digital communication tools
- Easy access to digital devices.
- Educational games
- Educational learning software, new communication & information technologies [x6]
- eLearning platforms with links to various useful resources [x6]
- Enabling technologies
- Extended Reality (XR)
- Free digital tools.
- Functional platform Cluster [x3]
- Metaverse for distance learning
- Cyber security concepts and tools

- Online Search Engines
- Universal learning system
- Electronic resources from Ucha.se and Cannes Academy
- Digital libraries and databases
- Inclusive technology
- Interactive software such as simulation type games & AI experiences [x6]
- Interactive video-projectors and devices for optical reading
- Laptops, Computers, Tablets, smart boards, iPads [x9]
- Low-code no-code software development tools [x2]
- Basic management of digital communication tools, use of the internet via computer...
- Coding, Email, internet search [x3]
- Mobile Phone and social media [x8]
- More flexible education and training paths
- Microsoft office tools & MS Suite [x12]
- Google suite [x6]
- Virtual teaching platforms & online learning [x7]
- Open Educational Resource (OER)
- Creative tools for collaboration (e.g., Miro) [x5]
- Robotics [x3]
- Schools must open up to BYOD (Bring Your Own Device)
- Software or platforms for visual expression
- Software or tools to create digital multimedia content / design (images, graphics, presentations, videos) [x3]
- Software that can adapt to the different levels
- Technologies to support poor literacy
- The "flipped classroom" [x2]
- Tools like Liveworksheets, LearningApps, H5P, Wordwall, Quizizz, Quizlet, Wakelet, Wizer, Qoconqr, TED ED, Free 3D anatomy Models, National Science Foundation, CommonSpaces, Library of Congress, ClicZone, Play Mathematics, Europeana, Khan Academy, Academico, Google Classroom, Edpuzzle, Kahoot, Edraw Mind Map, Jamboard, Geobra, Padlet, Bookcreator, Worldwall.

- Tools to monitor learners' engagement.
- Training-related applications [x2]
- Translation/ display of both language texts adjacent to the first language
- More acceptance of a range of evidence types - voice recording or other formats other than academic type writing
- Immersive learning experiences – gamification, Minecraft etc. [x3]
- Wi-Fi availability [x2]

The eighth question asked the respondents to rate the current collaborative efforts of external stakeholders (e.g., national and regional governments, policymakers, businesses, foundations and NGOs) in ensuring the quality of VET education. The ranking scale was out of 5; where 1 meant poor and 5 meant very satisfactory. This question received a 90% response rate. At a glance, majority of respondents (approximately 43% in total) rated current collaborative efforts of external stakeholders negatively, of which 12% rated such as poor and 31% as unsatisfactory. This was followed by 35% of respondents rating current collaborative efforts as average. The remaining respondents, some 19%, rated these efforts positively, of which 16% stated that they are satisfactory and 3% as very satisfactory (see figure 7). The overall results however suggest a need for improvement in greater collaboration and involvement of external stakeholders in helping shape and ensure quality of VET education.

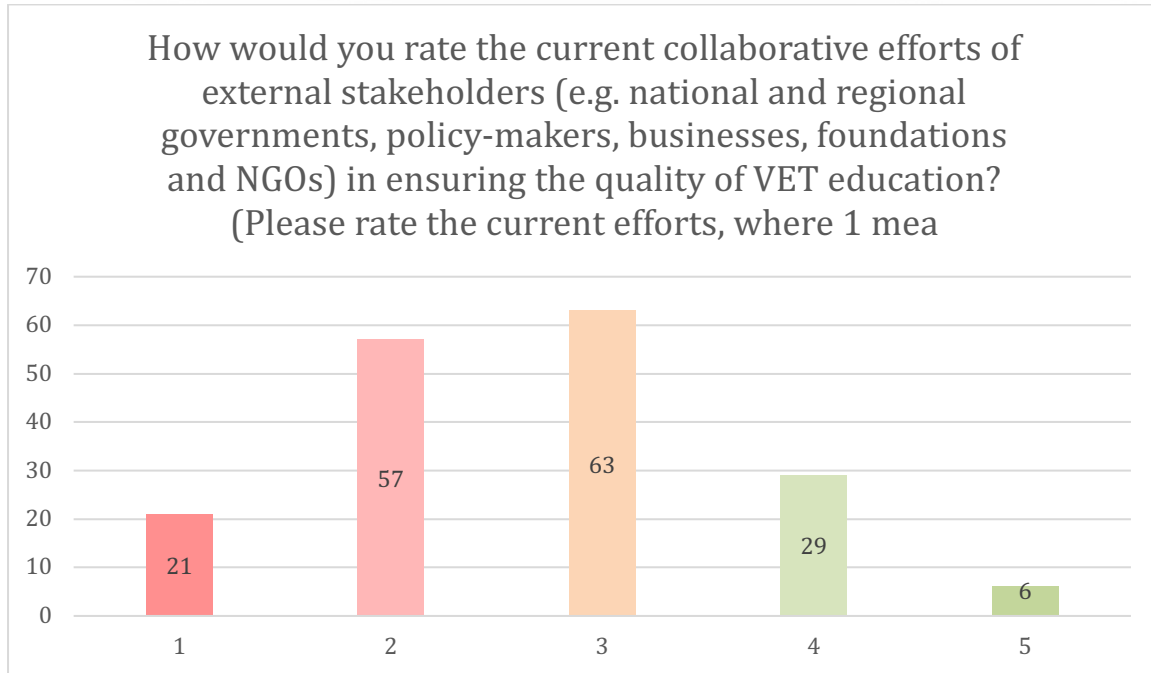


Figure 7 Current Collaborative Efforts of External Stakeholders

The ninth question asked the respondents about their opinion on what the main obstacle is in engaging relevant external stakeholders (e.g., national and regional governments, policymakers, businesses, foundations and NGOs) into a wider VET supportive ecosystem. The respondents were also asked to make recommendations on what VET providers could do to help overcome this obstacle or to improve collaborative efforts. This question received a 100% response rate. According to respondents, the most common obstacles in engaging relevant external stakeholders into a wider VET supportive system relate to a lack of clear communication (8%), lack of funding (7%), lack of resources (5%), lack of a common goal (4%) and the costs or time involved (4%). Some recommendations on what could be done to help overcome these obstacles included greater collaboration, networking and connections between stakeholders (7%), greater awareness and understanding of Vocational Education and Training (3%), more clarity and transparency between stakeholders (particularly regarding their roles – 3%) and educating external stakeholders on what the Vocational Education and Training sector has to offer. The table below contains a summary of the remaining responses and suggestions.

Suggestions

- Clear communication [x15]
- An ecosystemic mindset is required
- Lack of solidity and coordination [x5]
- Autonomy of the local Education providers
- Primacy of Exam results as an indicator of success of courses.
- Awareness and understanding [x5]
- Stakeholder collaboration in developing curriculum materials, careers talks, site visits, internships, fundraising / sponsorship [x2]
- Bureaucracy [x7]
- Change the mentality with a company or encourage them
- Collaboration, networking, connections (i.e., focus groups / workshops) [x13]
- Costs, time [x8]
- Clarity and transparency between all stakeholders (roles) [x5]
- A common strategy/action plan based on clear and shared objectives [x3]
- An ecosystem with a holistic approach
- Businesses and schools can better understand student expectations and make the learning experience authentic.
- Expertise, the will to promote change and financial obstacles.
- Form joint UDL
- Funding [x13]
- Educate external stakeholders on what the VET sector has to offer [x5]
- Honesty, putting people before any other interest
- Lack of understanding why collaboration is needed
- Disconnection in support structure [x5]
- Economic reasons.
- Identify needs and resources to design specific programmes for this purpose.
- Inefficient state management of vocational education
- Dissemination of training and professional opportunities should be improved.
- Lack of resources [x9]

- Lack of vocational qualification requirements in some occupations / VET recognition [x2]
- Diversity
- It needs to have qualified and well-trained persons.
- It should be part of their daily job
- Responsibility
- Lack of a common goal / vision [x8]
- Lack of initiative and capacity
- Lack of visibility of their efforts.
- Lack of interest from external stakeholders [x4]
- Monitoring and evaluation mechanisms that allow continuous feedback, adaptation and modification of participation
- National and regional governments, as well as policymakers, are perceived as too far from the other mentioned stakeholders.
- No National policy to engage stakeholders in school visits
- Pay teachers better
- Politics/Politicians focus on nationalism/ethnicity/prevaling culture/maximizing profits
- Prestige of entrepreneurship, valuation, not least price.
- Quality Assurance and awarding bodies restrictions are significant barriers/obstacle
- All jobs require specific training [x2]
- Student councils and parliaments can get involved
- That it is private.
- The absence of an integrated framework and tools for working together [x2]
- The courses do not give access to the market.
- Dual system for connecting stakeholders [x2]
- The market has yet to become profitable at a large scale
- The perception of VET/FET as a back-up plan to university
- The stakeholders don't accept to change, they don't adapt, they don't know their needs
- There are too many policymakers, foundations and NGOs involved

- Build from bottom up (teacher and students) [x2]
- To achieve a national response outside of regional actions.
- Allow VET to be heard, especially on its needs.
- Fit for purpose system
- Transport
- Understanding the real needs of labour path
- Until recently VET was undervalued
- Values and allocation of funds
- Actively consult with those students and families who should use a multi-service approach to find ways to support them more effectively.
- We have cultural obstacles right upstream

The tenth question asked the respondents about their opinion on environmental sustainability practices or environmental-friendly means of teaching that they thought should be integrated into VET learning programs. This question received a 90% response rate. The most significant suggestions included waste reduction (13%), online, e-learning or blended learning (7%), digitalising (6%), green projects (6%), recycling (6%), field trips and teaching in a natural environment/outdoors (5%). The table below contains a summary of the remaining suggestions.

Suggestions

- European Bauhaus initiative
- Provision of knowledge, skills & attitudes necessary for sustainable work and life [x3]
- Supporting students' participation in wider social activities
- Providing guidance and support to schools and teachers on this how to cooperate and exchange experiences within EU Member States.
- A knowledge of the SDG's and how to apply best practice
- All realistic practices, a variety of workshops, cultural and educational trips, formats of coexistence in natural or technological environments.
- Emphasis on importance of sustainability in working life for future generations [x2]
- Analyse the productivity of VET programs

- Awareness [x5]
- Collaborative action [x3]
- Case studies
- Celebrating national/international environmental holidays
- Collecting data
- Cookery schools, teaching the subject to avoid the consumption of junk food, precooked food, food rich in fat
- Courses/classes on the directly implementable actions to protect the environment
- Environmentally friendly equipment and supplies [x3]
- In-house professional development programmes [x2]
- Digitalising [x11]
- Use of recyclable and second-hand materials [x2]
- Admit training programmes that only meet specific criteria in this field
- Eco-friendly practices, for instance greenshowers, etc
- Include Ecology / ecological footprint & sustainability as topics [x5]
- Economical printers, printing limits [x3]
- Educating learners at the interconnectedness of our world and interrelation of social, environmental and economical dimensions.
- Science-based, interdisciplinary, action-oriented methodology education for sustainable development
- Embed sustainability practices in all modules [x3]
- Explain the concepts
- Field trips and teaching in a natural environment/outdoors [x9]
- Follow the example of Green Schools
- Ecological education – right resources, prejudices with online info, uncertainty [x2]
- Fostering the orientation to a rational and efficient use of resources.
- Green competitions and contests for sustainability challenges [x2]
- Green projects [x10]
- Optimising resources in support of the environment
- Environmental impact, consequences and the methods to reduce them [x2]

- Online catalogue - Open Educational Resource (OER) repositories
- Provide incentives and reward environmentally friendly behaviours [x4]
- Increased dematerialization of teaching materials and provision of measures to develop "cross-curricular" green skills in all curricula.
- Integrate environmental education in any curriculum, programme, training [x5]
- Introduce special courses on digital platforms for practical environmental education
- Monitoring the environmental footprint [x2]
- Online, e-learning, blended learning [x12]
- Partnering with local green organizations or companies.
- Personal Development courses and ICT courses
- Practical training, field work and work experience
- Promoting nature and natural resources (nature science) [x3]
- Provide environmental training [x2]
- Public transportation for staff and learners to education centres
- Recycling [x10]
- Reduce waste (e.g., paper, electricity, water, Co2, etc.). [x23]
- Alternative / renewable energy resources [x3]
- RESPECT FOR LIFE and FREEDOM OF CONSCIENCE.
- Sharing of materials
- Sustainable design and construction [x2]
- Take focus from recycling to consuming less
- Teacher must practice what they teach
- The EU Green Deal should be introduced into the school curricula
- Maintenance of the flower / organic gardens and green house [x2]
- Creation of a youth eco-path
- Preservation of nature as a source for human development and a healthy way of life
- To integrate the concept of Circular Economy in every curriculum [x3]
- Valuing green in training centres
- Create teaching aids for the development of ecological thinking and student action [x3]

The eleventh question asked the respondents to select the green competences that should be addressed in any VET learning programme. This question received a 90% response rate. The most significant green competences selected involved critical thinking (at 12%), collective action (at 11%), promoting nature (at approximately 11%), and valuing sustainability (at approximately 11%). The least significant green competences selected referred to political agency (at 3%) and systems thinking (at 4%). Some 1% of respondents suggested other green competences, which included creativity, participation, political action, problem solving, supporting equity, respect for life and freedom of conscience. A summary of the results can be viewed in figure 8 below.

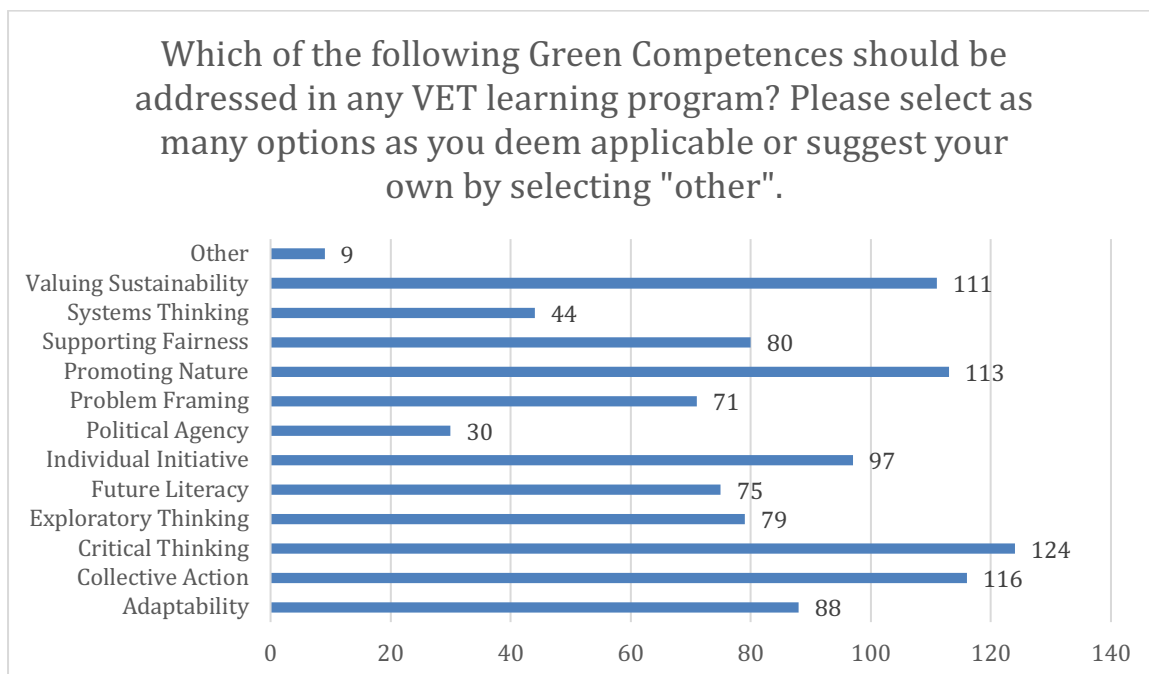


Figure 8 Green Competences

Finally, the twelfth question asked the respondents to select the mediums that their organisation uses to recruit new students for VET education. This question received a 90% response rate. The most significant mediums selected referred to social media networks (at 28%), open days (at 16%) and school visits (at 14%). The least significant mediums referred to more traditional marketing activities such as television adverts (at 4%) and radio adverts (at 5%). Some 2% of respondents suggested other mediums such as word of mouth, referrals, telemarketing, email,

open door policy, face-to-face, and website. A summary of the results can be viewed in figure 9 below.

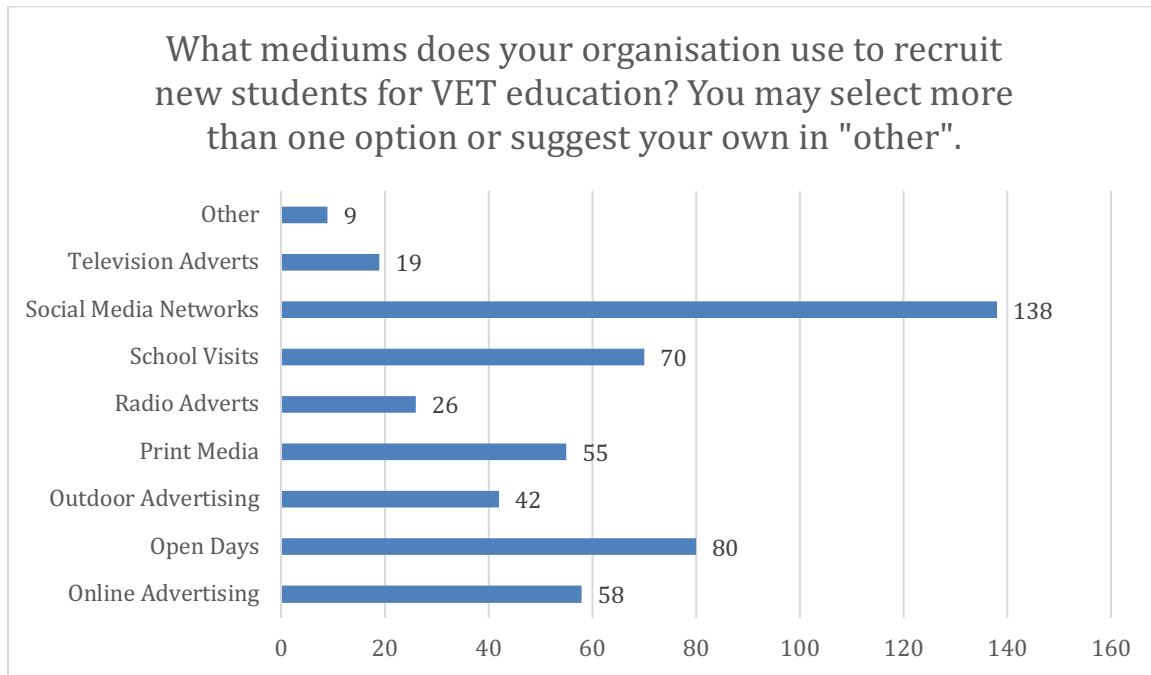


Figure 9 Mediums for Student Recruitment

The following section will now discuss the actual methodological framework.

3. THE METHODOLOGY

This section discusses the methodological framework for sustainable learning programmes.

3.1 Introduction

The purpose of the methodological framework is to provide Vocational Education and Training educators and providers with a reference guide which will enable them to co-create with external stakeholders learning programmes that are inclusive, green, and digital.

The methodological framework has been developed in a collaborative approach between the PI-VET team, with supporting insights gathered from educators and trainers in the Vocational Education and Training sector. The methodology has been structured on the basis of data insights and reoccurring themes in secondary research on the topics of course development, training development and curriculum development methodologies. The structure consists of three phases: a preliminary phase, development phase and an evaluation phase. These three phases integrate Kern's 1998 framework and the ADDIE model, consisting of five official stages in the framework – analysis, design, development, implementation and evaluation.

Framework Reasoning

A study by Tabin, Pannetier and Stolz (2021) used the Kern et al. (1998) framework for their methodology in curriculum development. This consisted of 5 main stages – 1) training needs assessment (the “gap” in current performance/delivery, 2) situation analysis (the statement of intent, project objectives and scope inclusive of target audience and organisation of training), 3) curriculum development (topic selection, learning outcomes development, assessment methods, and teaching and learning activities), 4) implementation and 5) evaluation and review.

Although somewhat similar to Kern's 1998 framework, various research sources suggest that majority of the models in instructional design follow the ADDIE model (Davis, 2013; Trust & Pektas, 2018; Stapa & Mohammad, 2019). This model involves analysis, design, development, improvement, and evaluation. Kern's 1998

framework omits the design factor, whereas the ADDIE model places emphasis on improvement rather than implementation. The analysis stage addresses what the learner is to learn, and all the contents created as per the following stages of the ADDIE model should be formed in accordance with this stage. This stage should include course intentions identification, and construction of measurable learning outcomes. The design stage should consist of a plan for how the learner will achieve the learning outcomes. This stage should include the choice of themes, activities (what happens in the classroom / outside of the classroom), and identification of learning skills. The development stage is usually intertwined with the design stage; it consists of the identification of activity preference types (students and tutors), choice of in classroom and out of classroom activities, time allocation, sequence of activities, involvement of technology in enhancing activities, peer review of activities, key performance criteria and measures, course assessment, evaluation and syllabus. This is followed by implementation, which is essentially the delivery of the content created during the design and development stages and put such into practice with learners. Finally, the evaluation stage reviews whether the goals formed during the analysis stage were achieved and what can be improved in the previous stages (Davis, n.d.).

Research by Han Ahn, Kwon, Pearce and Wells (2009) suggested the use of three phases in the development of a sustainable construction course for undergraduate students using the systematic approach. These three phases consist of 1) preparation (research), 2) development (overview/framework, goals and objectives of the course, contents and activities, instructional strategies for learning topic, assessment instruments, syllabus and course draft) and 3) improvement (evaluation and amendments). Similarly, to the ADDIE model, this highlights the importance of improvement in the development process. The research also suggested that in developing a course draft, first an overview or a framework should be created for context provision. This is followed by the creation of the syllabus to address things such as the target, goal, objectives, content, activities, assessment etc. The course development procedure / method is key to generating efficient outcomes.

Based on the above information, the methodological framework for sustainable learning programmes amalgamates the ADDIE model, Kern’s 1998 framework and use of three phases. This framework however acknowledges the improvement factor within the development stage. Please refer to figure 10 below for a visual representation.

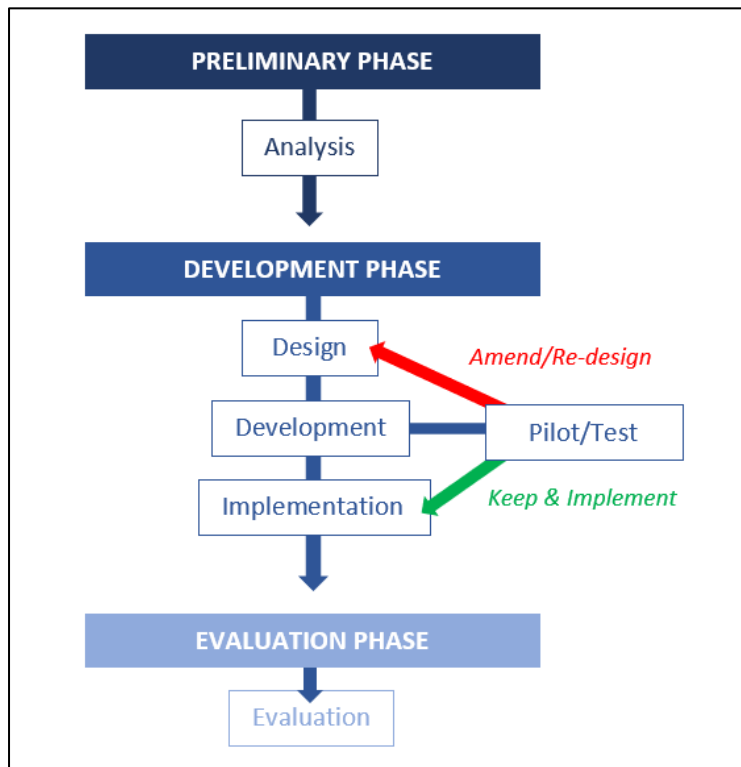


Figure 10 Methodological Framework

It is important to note that this structure can be applied to any course or programme type. However, to ensure the development of sustainable learning programmes, this needs to be further refined. This can be achieved by integrating sustainable requirements, practices and tools at every stage of the process. Doing so, will ensure that the sustainability theme is consistent across every process, and will help to eliminate any confusion and facilitate decision-making. This integration has been supported by the insights and information gathered during the Virtual Knowledge Fair and online survey responses.

The following section will now discuss the inclusive, digital, green and supportive ecosystems requirements, practices and tools at every stage in the development of sustainable learning programmes.

3.2 Stage 1: Analysis

The Analysis stage establishes the foundation for the subsequent stages of the development of sustainable learning programs.

Objectives

- To define the learning needs, the instructional problem and, ultimately, the learning goals to be achieved;
- to analyse learners characteristics to design learner-centred experiences;
- to assess the learning context;
- to define the nature of the task, knowledge, or performance to be included in the design.

Expected outcomes

- Understanding of the instructional problem, the characteristics and needs of learners;
- identification of the learning goals to be achieved;
- understanding of the most effective and relevant context or environment for learners.

Activities

The analysis stage consists of three main activities:

1. Context analysis;
2. Learner analysis;
3. Task analysis.

1. Content analysis

Content analysis includes *needs assessment* and *learning environment analysis*.

Needs assessment. In the scope of needs assessment, educators identify the instructional problem and the learning goals to be achieved in order to ensure that instruction is the appropriate solution to address the identified problem effectively. During the needs assessment process, we seek to gather information on the characteristics of the target learners, the learning environments, the need for the instruction and the scope of the instructional task.

Outputs of the needs assessment process are the problem statement, identifying why the instruction is needed, and the learning goals to be achieved.

Smith and Ragan (2005) suggest three major phases of needs assessment:

- Define the problem, by identifying the gap between the desired and the current status;
- Analyse the causes of the problem;
- Select the possible solutions to address the causes.

Asking the following questions could support the needs assessment process:

- What problem would you like to address?
- Can training/education solve this problem?
- What is causing the problem?
- What solutions can close the gap between the current and the desired status?

Methods to conduct needs assessment include surveys and document analysis (records, reports or other relevant written material), group discussion, questionnaires, interviews and site visits. Once a clear problem statement has been produced, the identified needs should be prioritised to define the learning goals.

Learning goals statements should include:

- The identification of who the target learners are;
- The learning outcomes achievable through the education/training experience, explaining what learners will be able to do in their performance context;
- The performance context in which learners will apply their competencies;
- The tools and steps needed to support learners in their pathway.

The analysis of the [Learning environment](#) aims at identifying where the instruction will take place and how the environment could affect the instructional delivery. Understanding the learning environment is critical to the decisions of the design of the instructional strategy. The analysis include the evaluation of:

- educators/trainers (e.g., their experience, preferences and digital literacy level);
- equipment and needed resources and their availability in the environment;
- characteristic of the space in terms of nature (e.g., physical or virtual) and

size;

- characteristics of the VET school/centre system and its mission.

2. Learner analysis

Learner analysis helps educators understand the learner population. The table below summarises the information a learner analysis could include.

Profile	Age, gender, educational backgrounds, disability status, social economic status.
Characteristics	Cognitive, physiological, affective and social characteristics.
Cognitive styles	<p>Information about whether and why a learner is able to perform a learning task. Gregorc (1985) suggests four major cognitive/thinking styles:</p> <ul style="list-style-type: none"> - Abstract, characterising learners who are able to visualise and conceive abstract concepts and ideas; - Concrete, characterising learners who prefer learning through facts and tangible representations of information; - Sequential, characterising learners who prefer to deal with information in a linear manner; - Random, characterising learners who prefer to deal with information in small chunks, in a nonlinear manner. <p>The following combinations of the cognitive styles can support a broader understanding of how learners organise and process information and ultimately learn:</p> <ol style="list-style-type: none"> I. a Concrete-Sequential individual would prefer practical and well organized content; II. a Concrete-Random individual would prefer practical learning experiences and multiple learning options;

	<p>III. an Abstract-Sequential individual would prefer abstract concepts but presented in a more linear and organised manner;</p> <p>IV. an Abstract-Random individual would prefer to be engaged in knowledge construction rather than just passively acquire information.</p> <p>Furthermore, the cognitive styles can suggest the pace of the lesson and the frequency of practice or abstract activities.</p>
Learning styles	How learners prefer to learn in and interact with different learning environments.
Current status	Learners' prior knowledge or experience of the subject area, assessing where they are about the identified learning goals.
Motivation to learn	Learners' motivational state, directing their cognitive effort and emotional engagement during the learning experiences.

To collect relevant information, educators could recur to interviews, surveys and observations, as well as document analysis.

3. Task analysis

Smith and Ragan (2005) describe task analysis as the process that “transforms goal statements into a form that can be used to guide subsequent design”. This stage consists of five main activities:

- state the **learning goals**, outlining the most suitable goals to directly address the learning problem identified during the needs assessment, focusing on the competences and changes the learning experience will foster;
- identify **learning outcomes**, such as the knowledge, skills, attitudes and cognitive strategies learners are expected to develop or improve by the end of the learning experience;
- conduct **information processing analysis** of the goals, by breaking down the

learning goal into the mental and/or physical steps learners must go through to achieve it;

- analyse **prerequisite skills**, by identifying the skills learners will need to have before proceeding with each of the information processing steps, including entry-level skills and skills which need to be taught during the learning experience;
- write **learning objectives**, describing the expected learning outcome in terms of what students will be able to do at the end of the learning journey. Learning objectives can be defined by transforming the skills which need to be taught during the program, identified in the previous stage, into statements composed of:

A	Audience
B	terminal Behaviour (i.e., what learners will be able to do at the end of the learning journey, described with action verbs)
C	Conditions of demonstration of the behaviour
D	Degree (standard/criterion)

The following table will now introduce the requirements, practices and tools in ensuring the inclusive perspective at this stage

Inclusive Perspective	
Requirements	
Different groups of students learn best in different ways and progress at different rates. An inclusive learning environment, enables all students, regardless of their circumstances, to enjoy the fullest possible learning experience. It benefits all students because it values their individual strengths and contributions and makes the learning experience richer and more diverse for everyone (Hockings, 2010).	

A VET educator should pay attention to the following factors in order to make the teaching more inclusive:

- Respect the diversity of students and the variety of ways that they learn.
- Enable all students to take part in learning and fulfil their potential.
- Ensure different students' learning needs are met, regardless of their backgrounds, learning styles and abilities.
- Remove any barriers that prevent students from learning.

Inclusive teaching also means not discriminating against students – directly or indirectly – because of their:

- age
- disability
- gender reassignment
- marriage and civil partnership
- pregnancy and maternity
- race
- religion or belief (including lack of belief)
- sex
- sexual orientation

To ensure that this stage of the programme design responds to the needs of diverse groups of learners, including marginalised groups and disadvantaged learners, as well as taking into consideration proper measures to foster gender equality, VET teachers should support their teaching practices by an inclusive teaching methodology (UNESCO, 2013). This includes:

- Teaching methods and skills – ensuring that the methods of teaching and learning are flexible, learner-centred and inclusive of diverse needs; that students are supported to develop their own locally relevant resources, and that they are supported to understand and engage in formative forms of assessment;

- Students receive proper, ongoing support throughout their learning process.
- Teachers and students reflect continuously on their learning journey in order to spot any gaps or areas that require attention and reassessment as to the way they are being passed on from teacher to learner, to achieve the maximum of the learning experience.
- taking a systematic approach to welcoming diversity and identifying barriers to inclusive education
- promoting and facilitating learner-centred teaching
- employing interactive and varied teaching and learning approaches, and avoiding the overuse of methods which are inappropriate for some learners
- using approaches to teaching which encourage teachers to innovate and adapt curricula and materials to fit local contexts
- engaging in formative and authentic forms of assessment
- developing personalised learning approaches for students
- ensuring good quality supervision and support for students
- engaging in reflective and reflexive teaching practice to enhance inclusive teaching competencies.

Requirement 1: Understanding of Students

The first step in the process is for Vocational Education and Training teachers to hold a good knowledge and understanding of the group of students that they are about to teach. This includes any disabilities they may have, how they learn best (visual, auditory etc.) , any barriers to education (e.g. lack of digital knowledge, cultural barriers etc.) Once the educator knows the group of students that they have in their classroom, they can prepare educational material with more ease which is student- centred and adjusted to the particular needs of the students in the group.

Requirement 2: Assess Student Knowledge

Once the first step has been completed, the VET educator should assess the level of knowledge that each individual in the group possesses at the start of the teaching period.

This is important in order to create educational material which challenges every student to learn more, but at the same time does not leave anyone feeling inadequate and falling behind.

Requirement 3: Test Educational Material

The final step, after the initial analysis, is to test whether students are learning and feel part of the whole group, without being discriminated against directly or indirectly. This is important in order to make sure that every student is learning and progressing along with the rest of the group.

Practices

Practice 1: Understanding of Students

To achieve this first step, VET teachers can use standardised tests and reports from any previous educators or doctors (if this is applicable), as well as surveys and short questionnaires, to collect as much information as possible on the learning needs and background of the group of students at hand.

Practice 2: Assess Student Knowledge

To assess the knowledge of their students at the beginning of the learning course, VET teachers can use specialised tests that assess the basic knowledge required for the particular course, to evaluate the current educational knowledge of the group of students at hand. The tests used have to be in such a format that allows every student, depending on his learning needs and style of learning, to show what they know.

Practice 3: Test Educational Material

At this step the educator will test the educational material created to ensure it is effective and leads to the desirable outcome. This final step, requires that both teacher and students reflect back on the knowledge acquired and the methods used to assess whether or not they are gaining the maximum of the educational experience. This can be achieved through group discussions and/ or by using tests and questionnaires.

Tools

Tool 1: Surveys and Quizzes

Teachers can use tools like the following quiz, to assess what type of learners their students are.

Link: <https://blog.bjupress.com/blog/2021/10/26/learning-styles-quiz-what-type-of-learner-are-you/>

They can also prepare surveys and quizzes with the aim of collecting information from the students themselves on any difficulties they may experience in learning and on personal preferences. When it comes to a diagnosed disability, teachers should be in communication with specialists and parents on how to best approach their students to achieve their maximum capabilities.

Tool 2: Quizzes and Educational Games

To assess the current knowledge of their students at the beginning of the academic year, teachers can use applications, such as **Socrative** or **Quizalize**, which allow teachers to engage the class with fun quizzes and educational games assessing the knowledge of the students in a non-threatening manner.

Tool 3: Assessment Applications

To test that the educational material created is effective and that all students are improving and gaining new knowledge, teachers can use applications, such as **Edpuzzle**, which allows the educator to turn videos into a quick assessment. Or other applications such as **Kahoot** or **Edulastic**, which allow teachers to assess the progress of their students in fun, interactive ways.

It is always important to make sure the assessment methods used are as varied as possible to cover the range of learning styles and communication styles of the students, so that every student is given the opportunity to show in the best way possible what he knows.

The following table will now introduce the requirements, practices and tools in ensuring the digital perspective at this stage

Digital Perspective
Digital Requirements
<p>The purpose of the digital perspective is to ensure the learning programme enhances the digital competencies and skills for digital transformation, both for the educator and the learner. In recent years, there has been a rapid transformation in innovation and technological evolution. Digital transformation has been a recurring theme in reshaping society, the labour market and the future of work. Due to this rapid transformation, many of the now most in-demand occupations did not even exist 10 to 5 years ago (World Economic Forum, 2016). This is supported by the European Centre for the Development of Vocational Training (Cedefop, 2018), suggesting that technological changes are a major driver of changing skill needs for future work environments, with about 85% of all EU jobs needing at least a basic digital skills level. The recent Covid-19 pandemic further accelerated this transformation, with trends of online or hybrid working/learning models emerging in the labour market and educational environment. This in turn created the need for greater levels of digital capacity in education and training; to equip learners and future workforces with the necessary knowledge, skills and competencies in line with digital change (European Commission, 2020).</p> <p>The following technological trends will need to be considered by educators for 2022 and beyond. Various sources are suggesting that these technological trends are rising in popularity in transforming education and training, as well as the future of work (Howell & O'Donnell, 2017; Newman, 2017; McGuire, 2018; Gupta, 2019; Zain, 2021; Bui, 2020 & 2022; Marr, 2022; Martin, 2022):</p> <ul style="list-style-type: none"> Virtual and Augmented Reality - Virtual reality refers to a simulated experience within a computer-generated environment/digital classroom, where the learner can interact with others and become immersed in virtual learning via a virtual reality headset. Augmented reality helps to enhance the educator's instructions by creating an immersive/interactive

experience for the learner through the integration of digital technology and the learner's environment in real-time.

- **Artificial Intelligence**
- **Gamification** - utilizing gaming technology as an instructional tool for teaching, training and learning; encouraging a more fun and engaging learning experience
- **Big Data** - this refers to the collection and analysis of complex and large data sets.
- **eLearning** - education and learning taking place through electronic/online means, utilising laptops, computers, tablets/iPads, and smartphones.
- **Personalised learning** - this considers how different students learn, prioritising the learner. The educational experience is customised/tailored specifically to cater to the learner's needs.
- **Cloud Computing**
- **Cyber security**
- **Robotics**
- **Animation** - this refers to the utilisation of moving images/cartoons for teaching and/or learning through storytelling and content which simulates real scenarios.

The following highlights the requirements for this stage in ensuring the digitalisation of educational practices.

Requirement 1: Labour Market Needs / Trends

As previously mentioned, the Analysis stage establishes the foundation for the subsequent stages of the development of sustainable learning programs. To ensure the digitalisation of educational practices at this stage, it is important to consider the labour market's technological needs and any external (national or global) emerging trends in technology when carrying out the "context analysis". By analysing the latest digital trends and skills gaps, the educator will have a good indication of the digital knowledge, skills or competencies there is existing demand for. In doing so, the skills or competencies that there is lack of can be addressed or taught through the learning program, thus supplying the labour

market with talented individuals prepared for the future of work in an ever-changing digital environment.

Requirement 2: Learner Analysis

To ensure the digitalisation of educational practices at this stage, a good understanding of the learner population is important to the creation of any new learning program. In doing so, the educator will be able to customise the learning program to produce a more beneficial learning experience, catering to different varieties of learners. In the context of the digital perspective, this refers to the learners' background (existing digital knowledge and competencies), disability status (will learners with disabilities have an equal opportunity to learning / developing digital skills or will they need assistance to be able to do so), social economic status (will learners belonging to marginalised groups have access to digital technologies/equipment or will they need assistance in accessing such), learning styles (how would they prefer to learn digital skills/competencies or interact with digital technologies), motivation for learning, learner's primary area of weakness (helps determine level of complexity and detail required for content).

Requirement 3: Learning Environment (Technical Considerations)

The final requirement regards the technical considerations of the learning environment. As previously mentioned, an analysis of the learning environment aims to identify where the instruction will take place and how the environment could affect instructional delivery. In the context of the digital perspective, this will require an evaluation of 1) the educator's digital experience and literacy level, 2) nature of the learning programme (whether the programme will be delivered in a physical or virtual environment), 3) the equipment and resources required for programme delivery etc. This will help to identify the types of learning technologies which will be required for the development and delivery of the programme (e.g. the learning management system (LMS) used to host the programme, tools for programme development and delivery etc.) and will take into consideration the learners and trainers accessibility to technology (which is vitally important in ensuring equal opportunities for learning digital competencies).

Practices

Practice 1: Labour Market Needs / Trends Analysis

To fulfil this requirement, the VET educator can conduct secondary research (desk research – research that has already been gathered by somebody else) to gather insights into national and international trends in digitalisation and technology. Analysing secondary data using journal articles, reports, conference material, blogs, newspaper articles, books etc. will help to identify any skills gaps in the labour market and professions in demand of educated talent. It will also enable the educator to identify any trends for the future of work in the context of digitalisation, such as emerging new types of professions, emerging technologies, need for upskilling/reskilling etc.

Practice 2: Learner Analysis

To fulfil this requirement, the VET educator needs to have a good understanding of the learner population, and the impact of digital transformation on their educational and work-related experiences. This can be achieved by conducting a “learner analysis” using a mixed approach. The VET educator can conduct secondary research to analyse existing data/insights on the learner population in the context of digitalisation. This will provide the educator with an indication of the type of learners in the vocational education and training sector (profiles, demographics, characteristics), insights to student engagement with digital technologies, learning styles, motivations for learning, trends in digitally-enhanced learning experiences etc. The VET educator can conduct primary research to collect their own data directly (more relevant to their learning programme and target audience) in the form of surveys / questionnaires, or interviews with the learners. By doing so, the educator will be able to create a more beneficial learning experience for all, catering to a diverse range of learners.

Practice 3: Learning Environment (Technical Considerations)

To fulfil this requirement, an assessment will need to be conducted to determine the educator’s digital competencies and literacy level. This can be achieved with a skills test or a screening interview process to determine whether the educator is fit to deliver the programme (alternatively they may require upskilling / training). An assessment will also need to be conducted of the equipment and

resources required for programme delivery. This can be supported by prior secondary research undertaken to identify what skills / competencies need to be taught, as this will provide the educator with an indication of the sort of technologies and materials which will be required for teaching and learning. The VET educator will also need to consider any existing equipment available in the educational institutions / specific departments inventory that may be utilised for delivery or programme development, create a budget sheet for any costs of equipment should additional equipment be a requirement and consider potential sources of funding. Finally, using secondary research conducted as per the “learner analysis” and available resources, the VET educator should be able to make an informed decision regarding the nature of the programme (whether it should take place physically on campus, virtually or using a hybrid model of learning).

Tools

Tool 1: Labour Market Needs / Trends Report

Compile a report on labour market needs and trends using secondary research information sources. Such sources include peer reviewed journal articles, reports (national or international), conference material, blogs, newspapers, books/eBooks, websites etc.

Useful e-tools for research include:

- Microsoft Office (Word – for report writing)
- Google Scholar, ResearchGate, JSTOR, SAGE Journals, ScienceDirect (platforms/databases for searching books, academic journals, scholarly literature, research articles, conference papers etc.)

Tool 2: Learner Analysis Report

- 1) Compile a report on the learner analysis using secondary research information sources. Such sources may include the institutions annual report (usually contains valuable information about learner insights/trends), national reports (relevant to further education, higher education etc.), conference materials, results/data from relevant surveys or questionnaires etc.

2) Conduct surveys (minimum sample size of 100), and/or interviews (minimum sample size of 10). Useful e-tools for conducting surveys include Google Forms or Survey Monkey.

Please note, gathering primary research to conduct the learner analysis may suffice in itself, however by conducting secondary research the VET educator will be able to address any omissions or gaps in research with questions in the surveys/interviews.

Tool 3: Learning Environment Assessment

In assessing the learning environment, 3 elements need to be taken into consideration: 1) the educator, 2) equipment/resources and 3) nature of programme

The main tools for assessing the educator’s digital competencies and literacy level are that of a **skills test** or a **screening interview**. These will help to determine whether the educator is fit to deliver the programme, as well as their strengths and weaknesses (areas which would require some additional training).

The educator should create a plan of the equipment or resources required to deliver the programme, creating a **resources inventory spreadsheet** with each asset’s associated cost, whether it is subscription based or once off, whether the equipment would be rented or bought, and how such could be funded etc. This information can be stored on a spreadsheet using Microsoft Excel.

Finally using the previous information which had been compiled into the “Learner Analysis Report” and a resources inventory spreadsheet, the educator should be able to make a more informed decision regarding the nature of the programme.

The following table will now introduce the requirements, practices and tools in ensuring the green perspective at this stage

Green Perspective

Requirements

Through the European Green Deal and the goal to become climate-neutral by 2050, the European Union is working to deliver on the transformational changes needed in our economy and society. By aligning action across a range of policy areas, including energy, environment, mobility and agriculture, the EU aims for a green transition that is just and inclusive. Like all sectors, education and training needs to critically examine how it is responding to the climate and ecological crises – in terms of its operations, processes and practices and – crucially – how it is preparing learners for the future.

Key EU policies, including the Green Deal, the EU Biodiversity Strategy for 2030, the EU Skills Agenda and the Council Resolution on the European Education Area all point to the role of education and training in empowering and engaging people for environmental sustainability and boosting the skills and competences needed for the green transition.

Education and training for environmental sustainability is about the learning and teaching we need for personal, societal and environmental well-being now and in the future. It can be understood as an umbrella under which all subjects and disciplines have a contribution to make. Learners need to understand the inter-connectedness of economic, social and natural systems and move from awareness to individual and collective action and empowerment. Achieving this requires hands-on, engaging and action-based ways of learning, which foster knowledge, understanding and critical thinking (cognitive learning); practical skills development (applied learning); and empathy, solidarity and caring for nature (socio-emotional learning).

Young people have been especially vocal and active in demanding change and calling on public authorities to act urgently to tackle climate change and protect the environment for current and future generations. Many young people consider that school is failing to give them an adequate understanding of climate change, the environment, and how to live, work and act more sustainably. Despite being the least responsible, children are already facing the devastating consequences of the climate crisis: half the world's 2.2 billion

children are now exposed to multiple climate and environmental shocks, figures which are likely to worsen as the impacts of climate change accelerate.

Across Europe, a great number of initiatives, programmes and policy measures have been put in place to advance sustainability at all levels of education and training. Despite clear progress and growing public and policy attention, learning for environmental sustainability is not yet a systemic feature of education and training policy in the EU.

Challenges exist at various levels:

- The interdisciplinary nature of learning for environmental sustainability; the need for learner-centred pedagogies, new approaches to assessment, organisational change and community partnerships often run counter to established cultures and norms in education policy and practice.
- Whole institution approaches where sustainability is embedded in all processes and operations (e.g., teaching and learning, research, campus and buildings management) are not yet widespread due in part to insufficient funding and institutional support.
- Teachers and trainers across Europe are already actively teaching for sustainability, often driven by their sense of responsibility to prepare future generations. At the same time, many educators say they lack training and support in sustainability education and training, in particular, regarding interdisciplinary approaches, active pedagogies and the challenging subject matter.

Urgent efforts are therefore needed to redirect education and training as a whole towards the deep and transformative changes needed for the green transition and prepare learners for a rapidly changing society, economy and future.

Requirement 1: Learner-centred, hands-on and based on real-life experiences

VET education is measurable and the results need to be understandable. For this reason, when the programme is created, it needs to have a foundational basis in being student-centred and in integrating practical real-life experiences.

Requirement 2: Support educators, including leadership teams, to teach and act for sustainability

The educators are the main force, they are the flame, which inspires the “fire” for new knowledge. It is therefore important that educators have the necessary green competencies, knowledge and skills and lead by example.

Requirement 3: Foster collaboration and partnerships in local companies

Educators need to ensure strong relations with local enterprises in order to provide real working atmospheres for the learners. Learners and companies need to have common understanding for the culture and dynamic in the enterprise. For managers it is useful to know in advance the attitudes of the learners and their capacity for growing.

The implementation of the first three requirements is obligatory to be **founded on strong policies**. This:

- **Requires supportive learning environments where the institution as a whole is active in sustainability** - The learners need to understand that connections between different levels in institutions are very important for establishing green environment.
- **Takes a life-long learning approach** - Unfortunately, green transitions can eliminate some jobs in towns and cities and for this reason it is necessary to have the possibility to re-qualify / upskill the workers for doing new activities.
- **Builds sustainability competences** - green means sustainability, the learners need to understand the relation between knowledge about green approach, which is the first stage, after that they need to be inspired

for development green attitudes and in the end, they need to have measurable skills for realisation the green transitions.

Practices

Practice 1: Learner-centred, hands-on and based on real-life experiences

To invest time to establish the relations with every learner and to find ways to include the learner in real-life experience.

Practice 2: Support Educators, including leadership teams, to teach and act for sustainability

Educators need to spend time every week self-educating and always investigating the works of his colleagues worldwide.

Practice 3: Foster collaboration and partnerships in local companies

To implement common educational activities with the local companies, which help involvement for transition to green approach.

Tools

Tool 1: Informal Education

Informal education with approaches like simulation games, can provide a chance for learners to be in safe zone, which can be similar to real-life experiences.

Tool 2: Upskilling Resources

To upskill, VET educators can watch videos, read articles, new policy documents and books, or avail of free online courses.

Tool 3: Partnerships

Partnerships with external stakeholders are key to increasing the level of internships in real working conditions.

The following table will now introduce the requirements, practices and tools in ensuring the supportive ecosystem perspective at this stage

Supportive Ecosystems Perspective

Requirements

The COVID-19 crisis has increased the urgency of guaranteeing quality education in Vocational Education and Training (VET) that promotes the training of employees, improves the employability of recent graduates, and promotes training programmes for the most vulnerable groups.

Therefore, education and training needs to be tailored to the demands of the current environment, which implies the continuous updating of the professional modules of the learning programmes, adapting them to the demands of the productive system with the perspective of the requirements of sustainable development.

The above is aligned with Sustainable Development Goal number four (SDG 4) of the United Nations 2030 Agenda, a priority for public administrations and supporting ecosystems which aims to achieve universal access to quality education throughout life and promote technical training, eliminating economic and gender barriers that are a source of inequalities.

Developing initiatives based on the union of forces and efforts that contribute to achieving this goal is key to overcoming poverty, favouring the reduction of inequality, improving social and environmental awareness and being a driving force for the economy and innovation.

Improving collaboration between higher education and Vocational Education and Training institutions or collaboration between the educational administration, social and economic agents in order to favour entrepreneurial initiatives and innovation, are essential in order to achieve this objective. These structural alliances or partnerships will enable faster progress in the process of change towards sustainable development, as well as favouring good practices in their immediate local and regional environments.

In other words, companies and social agents must be involved in the development of VET programmes, with the aim of reinforcing strategies for

change towards a new development model and the incorporation into training of factors that contribute to social cohesion and development. Thus, agreements can be reached to promote a culture of responsibility and the commitment of supporting ecosystems to education and sustainable development.

Practices

Preliminary questions:

- **Eligibility criteria:** *Does the stakeholder influence the teaching process?*
- **Relevance criteria:** *Can the stakeholder change the learning process?*
- **Impact criteria:** *Will the stakeholder contribute to the long-term success of the VET institution?*

The **participation** of social agents, the different administrations and other actors in the identification and updating of qualification needs, as well as the training required, ensures the value of qualifications in the labour market.

Public-private **collaboration** and, in particular, the participation of companies in the definition of skills profiles and the establishment of learning programmes is essential to ensure that Vocational Education and Training is of quality and meets the demands of the labour market.

The success of an effective VET System requires a close alliance, **cooperation** and **trust** between three actors: *i) administrations, ii) training centres and teachers, iii) companies and families*. These actors are the ones who give solidity and efficiency to the Vocational Education and Training System.

This **alliance** between these three actors is particularly important because of the dual nature of VET. The effective commitment of enterprises and the role of educators are particularly important for its success. However, its social and entrepreneurial success depends on its extension to all the small and medium-sized enterprises that make up the business sector.

Tools

For enhancing the role of supporting ecosystems and coordination between key actors (*social agents, institutions and entities, especially local corporations, professional associations, non-governmental organisations, and other business and trade union entities*), long-term strategic alliances can be generated in the VET system.

The following initiatives are proposed:

- **Signing of an agreement** between the collaborating entity, the educational administration and the labour administration for the organisation and development of the learning programmes.
- Regular **discussion chairs, research projects and observatories;**
- Collaborating with **sectoral or thematic forums and associations;**
- **Focus groups** to validate the content of the learning programmes proposed in order to get a more detailed insight into the content.

Supportive ecosystems, and especially companies are aware that the development of their activity has an impact on their stakeholders and on the environment in which they operate. Within this framework, they are increasingly reaffirming their commitment to support and contribute positively to the development of society.

Education is a completely cross-cutting area of action that affects all companies and countries. Companies *-as any other relevant actor in the education field-* can support training and job orientation programmes accessible to the most vulnerable groups, aimed at:

- minimising school failure and reintegration into the labour market;
- encourage corporate volunteering aimed at bridging the gap between education and the labour market;
- promote initiatives to improve access to education in the least developed areas where companies operate.

All these actions can become an intangible asset of strategic value for supporting ecosystems, as well as an opportunity to influence the VET system

through collaboration in the development of Sustainable Learning Programmes that are inclusive, green and digital.

The following section will now introduce the next stage of the methodology which focuses on the design aspect of the sustainable learning programme.

3.3 Stage 2: Design

The purpose of the Design Stage is to provide an overview or a foundational framework for the creation of sustainable learning programs. At this stage the Vocational Education and Training educator will create an initial draft for the learning programme, which will be more fine-tuned during the Development Stage. The contents of this stage will shape the overall learning journey; determining the duration of the program, its target audience, aims and objectives, learning outcomes, learning activities, delivery methods, resources, syllabus draft and/or concepts and assessment tools.

Objectives

- To provide Vocational Education and Training teachers, trainers, mentors or coaches with a uniform reference structure for planning, design and development of sustainable learning programmes.
- To equip Vocational Education and Training educators with a clear set of instructions or a detailed guide consisting of the requirements, practices and tools for the creation of learning programs which are inclusive, digital, and green.
- To facilitate the design of learning programmes which ensure access for marginalized groups and ease the transition to work for disadvantaged learners.
- To support the design of learning programmes which integrate environmental sustainability in their practices.
- To facilitate the design of learning programmes which will engage relevant stakeholders into a wider supportive ecosystem.
- To support the design of learning programmes which will enhance the digitalisation of Vocational Education and Training educators' teaching and training practices.

Expected outcomes

- Understanding of the requirements, practices and tools involved in the design of sustainable learning programs
- Identification and implementation of measures which ensure inclusive, digital, green and supportive ecosystem programme design

- Utilisation of the reference guide to design a plan for the overall structure of sustainable learning programs
- Evaluation of the design of the program being developed against the stated requirements to ensure their inclusivity, digitalisation, green element and facilitation of supportive ecosystems

Activities

This section describes the steps involved in the design of learning programmes.

1. Identify the program aims and objectives

To commence the design stage, the educator should identify a clear aim and objectives for the learning programme. An aim refers to the statement of intent or the ultimate goal to be achieved. Aims are usually broad and should state the desired outcome of the learning programme. In writing the aim, you should consider “how”, “what”, “where”, “when”, and “who” questions - e.g., what do you want to achieve through the learning programme, who will benefit from it, how will the learner gain the necessary skills/competencies, where will it take place (is it online, blended or fully classroom based?) etc. Objectives are more specific, or concrete goals which state how you are going to achieve the aim. It is recommended that you have between 8-10 learning objectives for your programme. Objectives should be S.M.A.R.T. - specific, measurable, achievable, relevant and timely.

2. Determine the duration and the target audience of the programme

At this step, the educator will determine a rough indicator for the duration of the learning programme and who the programme is aimed at. Is the learning programme going to be a short course or a long course? The duration of the programme will often be determined by the course content/syllabus and/or vice versa.

The target audience is the group of people (or learners in this case) most likely to benefit or avail of the programme. In doing so, the educator should consider the learner’s profile, characteristics, interests etc.

3. Construct key learning outcomes and highlight how the learner will

achieve these

4. Highlight the key learning activities and delivery methods for the learning programme

Next the educator will highlight the key learning activities and the delivery methods for the learning programme. Learning activities refer to the activities/resources by which learning goals or outcomes are achieved. Some examples of learning activities include debates, case studies, coaching/mentoring/buddying, simulations etc. Delivery methods refer to the practices used to deliver the learning. Examples of delivery methods include project-based learning, experiential learning, game-based learning, problem-based learning etc.

5. Determine what resources will be required for programme delivery

At this step, the educator will consider all the necessary resources required to deliver the programme. Learning resources are the assets used to support, organise, and deliver the teaching and learning process. Resources specific to programme delivery include staff, equipment (e.g., VR headsets, computers), tools (e.g., white board, projector, books), software, funding supports, location etc.

6. Draft the syllabus, the key content and concepts based on the skills needs identified during the Analysis Stage. Name the key learning units and develop instructional strategies for each.

7. Identify the key assessment tools required

The educator will identify the key assessment tools required to evaluate whether the learner has achieved the learning outcomes and acquired the necessary knowledge/skills/competencies through the programme. Assessment tools refer to the methods or techniques of evaluation used to determine how much the student has learned. Examples of such tools include final examinations, project-based assignments (case study, report, essay etc.), class tests/quizzes, performance-based assessments etc. There are three key steps involved in the design of assessment tools; 1) planning

(what are the evidence requirements and the most appropriate assessment tools for evaluation?), 2) action (actual design and development of the tools), and 3) reflection (trailing the tools and refining/improving such).

8. **Evaluate the learning programme design** (the overall instructions for evaluation can be found under the evaluation stage)

The above section described the activities required for the creation of learning programmes. The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is inclusive at this stage.

Inclusive Perspective
Requirements
<p>As stated previously: A VET educator should pay attention to the following factors in order to make his teaching more inclusive:</p> <ul style="list-style-type: none"> ● Respect the diversity of students and the variety of ways that they learn. ● Enable all students to take part in learning and fulfil their potential. ● Ensure different students' learning needs are met, regardless of their backgrounds, learning styles and abilities. ● Remove any barriers that prevent students from learning. <p>Inclusive teaching also means not discriminating against students – directly or indirectly – because of their:</p> <ul style="list-style-type: none"> ● age ● disability ● gender reassignment ● marriage and civil partnership ● pregnancy and maternity ● race ● religion or belief (including lack of belief)

- sex
- sexual orientation.

To ensure that this stage of the programme design responds to the needs of diverse groups of learners, including marginalised groups and disadvantaged learners, as well as taking into consideration proper measures to foster gender equality, VET teachers should support their teaching practices by an inclusive teaching methodology (UNESCO, 2013). This includes:

- teaching methods and skills – ensuring that the methods of teaching and learning are flexible, learner-centred and inclusive of diverse needs; that students are supported to develop their own locally relevant resources, and that they are supported to understand and engage in formative forms of assessment;
- students receive proper, ongoing support throughout their learning process.
- teachers and students reflect continuously on their learning journey in order to spot any gaps or areas that require attention and reassessment as to the way they are being passed on from teacher to learner, to achieve the maximum of the learning experience.
- taking a systematic approach to welcoming diversity and identifying barriers to inclusive education
- promoting and facilitating learner-centred teaching
- employing interactive and varied teaching and learning approaches, and avoiding the overuse of methods which are inappropriate for some learners
- using approaches to teaching which encourage teachers to innovate and adapt curricula and materials to fit local contexts
- engaging in formative and authentic forms of assessment
- developing personalised learning approaches for students
- ensuring good quality supervision and support for students
- engaging in reflective and reflexive teaching practice to enhance inclusive teaching competencies.

Requirement 1: Tools and Learning Resources

After assessing the needs of the targeted group of students, the educator should proceed in identifying the appropriate tools and learning resources that will be used to facilitate the learning of the students.

Based on the learning aims, the teacher should use applications and a variety of different modes of learning (image, audio, video, practical and interactive exercises), as well as special assistance from specialists in the case that a student requires special assistance due to a disability.

Requirement 2: Assessments

The teacher should make sure that the design section includes ways to assess whether the students are progressing and acquiring the appropriate knowledge based on the initial aims and objectives set at the start of the learning programme. Aims and objectives should be re-evaluated to check whether or not they need to be altered in any way, or whether the students are learning and progressing.

This can be achieved using assessment tools that allow the efficient assessment of all students, taking into consideration any disabilities/ difficulties or differences in learning.

Requirement 3: Student Initiative

At the end of the learning programme, the teachers should give the initiative to the students to present what they have learned to others, by allowing them to create, together with their teachers, educational tools of their preference. These tools can then be used by other students, including their peers to assess their learning and whether or not the aims and objectives of the learning course have been achieved.

Practices

Practice 1: Tools and Learning Resources

In line with above, a VET educator should commence small research on the educational tools and resources available online that will allow them to design an educational plan which will be inclusive.

Practice 2: Assessments

The VET educator should make sure he has a variety of tools in his toolkit that allow him to assess the progress of his students in a non-threatening manner and in a way that does not exclude anyone.

Practice 3: Student Initiative

The VET educator should make sure his students are capable of becoming independent learners and of working collaboratively to pass on the knowledge they have learned to other students and to their everyday life out of the classroom. This ability will be built up gradually during the learning course and will reach climax at the final phase of the course.

Tools

Tool 1: Learning Resources

Ideas of tools/ resources a VET educator can use to accommodate the learning needs of all his students are:

- 1) Interactive educational online games and tools (e.g. **Flipgrid, InsertLearning, Nearpod** etc.)
- 2) Images, sounds and videos.
- 3) Support from a special needs teacher.
- 4) Board - games.
- 5) Music/ theatre/ art tools.

Tool 2: Assessment Resources

The VET educator can again use online applications and real life scenarios that will help students apply what they have learned. An example of a tool is **Project-based learning**, a tool that ties instructions to real-world concerns that really matter to learners.

With PBL, learners gain knowledge and skills as they **investigate and respond to an authentic, engaging and complex problem or challenge** over an extended period of time. In conducting their inquiry, learners may do online research as well as go out into their communities to gather information through surveys and interviews that place the problem in a more personally meaningful context.

As they learn about the problem in the context of their own communities, learners engage in ongoing reflection about not only their emerging understandings but also the process involved in their inquiry. At the conclusion of the project, they make their project work public, often by sharing it with a wider audience through a classroom website or blog.

Music/ movement/ art/ theatre tools can also be used in a creative manner to allow the VET teacher to assess the progress of his students.

Tool 3: Student Initiative

This is the stage of the design at which the VET educator gives the stage to his students. They should be ready to become individual learners and to pass what they have learned to others.

This should be left up to the students, who may decide to work in groups.

Suggestions of applications like the one mentioned above can once more be used at this stage of the design.

Students and the teacher can use online tools as a way to assess and provide feedback to their students/ peers.

Ideas of some tools:

- 1) **Nearpod.** This app allows the teacher to broadcast a presentation with embedded polls and quizzes. You can control the pace of the presentation, and as learners respond from their devices, you can see the results in real time and adjust the lesson accordingly.
- 2) **Peardeck.** This tool works in a similar way. Learners can follow along with the teacher's presentation and answer interactive questions from any device that can connect to the internet.
- 3) **Socrative.** This tool lets you create quick assessments on any web-enabled device. Unlike Nearpod, Socrative does not have a presentation component.

4) **Plickers.** This system is unique in that it doesn't require learners to have devices to respond. They just hold up a card with a special code that can be read by an app on the teacher's device to collect the responses.

In the case that no internet, or electronic devices are available the teacher and students can use alternative ways, scenarios presented on paper and manual ways of providing feedback.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is digital at this stage.

Digital Perspective

Requirements

As previously stated, the purpose of the digital perspective is to ensure the learning programme enhances the digital competencies and skills for digital transformation, both for the educator and the learner. In recent years, there has been a rapid transformation in innovation and technological evolution. Digital transformation has been a recurring theme in reshaping society, the labour market and the future of work. Due to this rapid transformation, many of the now most in-demand occupations did not even exist 10 to 5 years ago (World Economic Forum, 2016). This is supported by the European Centre for the Development of Vocational Training (Cedefop, 2018), suggesting that technological changes are a major driver of changing skill needs for future work environments, with about 85% of all EU jobs needing at least a basic digital skills level. The recent Covid-19 pandemic further accelerated this transformation, with trends of online or hybrid working/learning models emerging in the labour market and educational environment. This in turn created the need for greater levels of digital capacity in education and training; to equip learners and future workforces with the necessary knowledge, skills and competencies in line with digital change (European Commission, 2020).

The following technological trends will need to be considered by educators for 2022 and beyond. Various sources are suggesting that these technological trends are rising in popularity in transforming education and training, as well as the future of work (Howell & O'Donnell, 2017; Newman, 2017; McGuire, 2018; Gupta, 2019; Zain, 2021; Bui, 2020 & 2022; Marr, 2022; Martin, 2022):

- **Virtual and Augmented Reality** - Virtual reality refers to a simulated experience within a computer-generated environment/digital classroom, where the learner can interact with others and become immersed in virtual learning via a virtual reality headset. Augmented reality helps to enhance the educator's instructions by creating an immersive/interactive experience for the learner through the integration of digital technology and the learner's environment in real-time.
- **Artificial Intelligence**
- **Gamification** - utilizing gaming technology as an instructional tool for teaching, training and learning; encouraging a more fun and engaging learning experience
- **Big Data** - this refers to the collection and analysis of complex and large data sets.
- **eLearning** - education and learning taking place through electronic/online means, utilising laptops, computers, tablets/iPads, and smartphones.
- **Personalised learning** - this considers how different students learn, prioritising the learner. The educational experience is customised/tailored specifically to cater to the learner's needs.
- **Cloud Computing**
- **Cyber security**
- **Robotics**
- **Animation** - this refers to the utilisation of moving images/cartoons for teaching and/or learning through storytelling and content which simulates real scenarios.

The following highlights the requirements for this stage in ensuring the digitalisation of educational practices.

Requirement 1: Identifying Learning Outcomes

To ensure the digitalisation of educational practices at the design stage, it is firstly important to consider the learning outcomes of the programme and how the student is to achieve these. During the previous “Analysis Stage” the VET educator was able to identify the labour markets technological needs, digital skills gaps and information on emerging technologies or trends. This information can now be used to shape the learning programme’s objectives and learning outcomes to state the digital competencies, skills or knowledge the learner is to know, understand and be able to demonstrate once the programme is complete. Having clearly defined learning outcomes is important for informing the students of what is expected of them and it helps educators to decide how to teach or assess the learners.

Requirement 2: Digital Content (Planning & Storyboarding)

The next step in ensuring the digitalisation of educational practices at the design stage is that of planning and storyboarding. Doing so will provide the VET educator with an overview or a foundational framework for the overall learning programme. It will help to simplify the planning process in designing content / drafting the syllabus for the most impactful learning experience. Storyboarding (originating from movie production) is a planning technique used to pre-visualise sequences of events. By mapping out the contents of the learning program in a logical sequence, the VET educator can ensure that the digital element in the instructional design is not omitted, but rather maximised (in regards to learning materials, tools, activities etc.).

Requirement 3: Technological Resources

The final requirement in ensuring the digitalisation of educational practices at the design stage refers to technological resources. Technological resources will be fundamental to the integration of digital teaching and learning practices. At this step the VET educator will need to decide which technology to select and use to conduct/deliver the learning programme.

Some things to consider:

- What Learning Management System will be used? (for assignment submissions, grading, learning materials etc.)
- What teaching/learning software will be required as per the learning activities? (walkthroughs, practical learning, tutorials, demonstrations etc.)
- How will the learning programme/or aspects of the programme be delivered? (will it be blended? Will it require additional classroom-based resources such as laptops/computers, interactive whiteboards, projectors etc. or will it require video communications software? Will it integrate virtual reality or gamification of any sort? – e.g. gaming platforms)
- What digital content will be involved? (i.e. video, photos, animation, e-books, .pdf supporting materials, webinars, podcasts etc.- what digital tools will be needed to create these?)
- What technological resources will be needed to assess the students? (e.g. for digital submissions, plagiarism detection software etc.)

Practices

Practice 1: Identifying Learning Outcomes

To fulfil the learning outcomes requirement, the educator should begin by referring back to the insights that have been collected as per the “Analysis Stage” to identify the digital knowledge, skills or competencies that are in demand in the labour market. Following this, the educator should write down about 5-8 statements of knowledge, skill or values that they would like the learner to achieve at the end of the learning programme. These 5-8 statements will form the foundation in creating the learning outcomes. Next the VET educator should take each of these statements and using Bloom’s Taxonomy pyramid, choose an action word that best describes what the learner must do to demonstrate that they have acquired this knowledge/skill/value (bottom to top – remember, understand, apply, analyse, evaluate, create). The VET educator should ensure that they use an action verb that corresponds best to the appropriate level of performance (e.g. lower level thinking skills for lower level courses, higher level thinking skills for higher level courses). Finally, the VET educator should rewrite each statement to form a clearly defined learning outcome (composed of the

skill/knowledge/value and action word). The educator should ensure that each learning outcome is learner-oriented, clear, observable and measurable.

Practice 2: Digital Content (Planning & Storyboarding)

To fulfil this requirement the VET educator can utilise Bloom’s Taxonomy model (previously used to help identify learning outcomes for the overall programme) to create an instructional design storyboard template. Doing so, will enable the educator to plan modules and course materials around the previously defined learning objectives and exercises.

The template can be structured into six sections (as per Bloom’s Taxonomy model) with boxes allocated as follows; Remember, Understand, Apply, Analyse, Evaluate, Create. Within these the educator can highlight the overall programme learning outcomes (allocating each to its relevant section, e.g. 1 outcome per box). Contents which can be included in the storyboard: modules, topics/lessons, learning materials/tools, learning activities, delivery methods, assessment methods, instructions, any other relevant information etc.

Sample template example incorporating Bloom’s Taxonomy model:

Program Name		Duration		Location	
Remember					
<i>recognize, list, describe, identify, name, locate</i>					
Program Learning Outcome(s):			State the 1 or 2 overall program outcomes relevant to this section.		
Content	Learning Activities	Materials / Tools	Assessment Methods	Instructions	
Module: Title Module Lessons / Topics 1. Xxx 2. Xxx 3. Xxx Module Learning Outcomes 1. Xxx 2. Xxx 3. Xxx					
Understand					
<i>interpret, summarize, paraphrase, infer, compare, classify, explain</i>					
Program Learning Outcome(s):			State the 1 or 2 overall program outcomes relevant to this section.		
Content	Learning Activities	Materials / Tools	Assessment Methods	Instructions	
Module: Title Module Lessons / Topics 1. Xxx 2. Xxx 3. Xxx Module Learning Outcomes 1. Xxx					

To ensure the digitalisation of practices, the VET educator may dedicate a module specific to technology/digital practices, they may incorporate a digital

element within the learning activities or the learning materials, they may utilise digital tools for delivery, or avail of digital assessment methods.

Practice 3: Technological Resources

To fulfil the final requirement concerning technological resources, the VET educator can use the instructional design storyboard (from requirement 2 of this stage) as a supporting framework for planning the necessary technological resources required for the learning programme. The storyboard will already contain a full outline or an overview of the learning programme, ensuring that all aspects are covered. Using this, the VET educator can match appropriate technological resources to each element comprising the learning programme – delivery, learning activities, materials/tools, assessments etc. Should there be too many options, the VET educator can then use a SWOT analysis framework to select the most appropriate resource by examining the different options against their strengths, weaknesses, opportunities and threats.

Tools

Tool 1: Bloom’s Taxonomy Pyramid

The key tools required to successfully identify learning outcomes include the full report with an overview of insights from the “Analysis Stage” and Bloom’s Taxonomy pyramid/framework. Bloom’s Taxonomy consists of three hierarchical models and it is used for classifying educational learning objectives into 5-7 levels of complexity. The three models focus on cognitive (thinking, reasoning, or remembering etc.), psychomotor (physical movement, motor-skills and coordination etc.), and affective (feelings, motivations, and attitudes etc.) domains. In these models learning occurs hierarchically, with most basic skills at the base of the pyramid working up towards the more complex ones. The idea is that each skill builds on previous skills towards more complex and sophisticated learning. Practice 1 primarily focuses on using the cognitive domain pyramid which consists of remember (basic retention of information - at the very base), understand (perceive or interpret information), apply (use information and apply to different situations), analyse (examine information to explore relationships between complex ideas), evaluate (use information to form ideas) and create (use information to create something new - at the very top).

Tool 2: Instructional Design Storyboard Template

The key tool to digital content planning and storyboarding is that of an instructional design storyboard template. This template can be a visual (image-based) or written (text-based) storyboard. Instructional design storyboards can be either visual or written (or a mix of both) and are used to provide an outline or an overview of a course / programme, as well as the learning journey. An instructional design storyboard should include modules, topics/lessons, learning materials/tools, learning activities, assessment methods, instructions, any other relevant information etc. Having an overall picture of the programme will enable the educator to make more informed decisions on areas where the digital element can be optimised and plan digital content. As previously mentioned, VET educators may use Bloom's Taxonomy model as a basis for their instructional design storyboard – this will ensure that all content corresponds to the learning outcomes. This storyboard can be drafted using Microsoft Word or PowerPoint, or platforms such as Articulate Storyline 360 or Adobe Captivate.

Tool 3: Instructional Design Storyboard

By this step, the VET educator should have utilised their instructional design storyboard template and filled it in to have a complete overview of the full learning programme. This complete outline can now be used to plan the technological resources required across each section. Therefore the key tool to fulfilling practice 3 is a completed draft of the instructional design storyboard.

Below contains some examples of technological resources:

- **Learning Management System** – Moodle, Canvas
- **Teaching/learning software** – profession specific software (e.g. Website design – WordPress, Wix, Construction – AutoCAD, Revit BIM software)
- **Delivery** – Microsoft Teams, Zoom, Laptops/Computers/Tablets, Interactive Whiteboards, Projectors, Speakers (audio), Virtual Reality Software & Headsets, Gaming platforms such as Second Life, Roblox, Minecraft, Simulation-based equipment
- **Digital Content** – creative process: Adobe Creative Cloud software (e.g. Premiere Pro for video creation, Adobe Illustrator for graphics and

infographics, Adobe Acrobat for .pdfs etc.), Microsoft Office software (Word for documents, PowerPoint for presentations, Excel for spreadsheets etc.), digital library access for eBooks and other online teaching/learning materials

- **Assessments** – Google forms or Edpuzzle, for quizzes, Moodle or Edulastic for assessment management, Microsoft Office software for written or presentation-based assignments, plagiarism detector software such as Plagiarism Check or Ouriginal

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is green at this stage.

Green Perspective

Requirements

At the design stage, it is very important to create programs which will result in “sustainable competences”. This will empower learners to embody sustainability values, and embrace complex systems, in order to take or request action that restores and maintains ecosystem health and enhances justice, generating visions for sustainable futures.

Requirements: Sustainable Design

In the design of the learning programme, the VET educator needs to ensure that it:

- Embodies sustainable values
- Embraces complexity in sustainability
- Envisions sustainable futures
- Inspires action for sustainability

Practices

Practices: Sustainable Design

The VET educator should involve students and/or external stakeholders in ensuring the theme of sustainability in the design of the learning programme. The practices during this stage should focus on how to integrate the following into the learning programme:

- Valuing sustainability
- Supporting fairness
- Promoting nature
- Futures literacy
- Adaptability
- Exploratory thinking
- Individual initiative
- Collective action

Tools

Tools: Sustainable Design

- To reflect on personal values; identify and explain how green values vary among people and over time, while critically evaluating how they align with sustainability values.
- To support equity and justice for current and future generations and learn from previous generations for sustainability.
- To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
- To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.
- To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
- To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
- To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.
- To act for change in collaboration with others.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program supports ecosystems at this stage.

Supportive Ecosystems Perspective

Requirements

The COVID-19 crisis has increased the urgency of guaranteeing quality education in Vocational Education and Training (VET) that promotes the training of employees, improves the employability of recent graduates, and promotes training programmes for the most vulnerable groups.

Therefore, education and training needs to be tailored to the demands of the current environment, which implies the continuous updating of the professional modules of the learning programmes, adapting them to the demands of the productive system with the perspective of the requirements of sustainable development.

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Improving collaboration between higher education and Vocational Education and Training institutions or collaboration between the educational administration, social and economic agents in order to favour entrepreneurial initiatives and innovation, are essential in order to achieve this objective. These structural alliances or partnerships will enable faster progress in the process of change towards sustainable development, as well as favouring good practices in their immediate local and regional environments.

In other words, companies and social agents must be involved in the development of VET programmes, with the aim of reinforcing strategies for change towards a new development model and the incorporation into training of factors that contribute to social cohesion and development. Thus, agreements can be reached to promote a culture of responsibility and the commitment of supporting ecosystems to education and sustainable development.

Practices

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The **participation** of social agents, the different administrations and other actors in the identification and updating of qualification needs, as well as the training required, ensures the value of qualifications in the labour market.

Public-private **collaboration** and, in particular, the participation of companies in the definition of skills profiles and the establishment of learning programmes is essential to ensure that Vocational Education and Training is of quality and meets the demands of the labour market.

The success of an effective VET System requires a close alliance, **cooperation** and **trust** between three actors: *i) administrations, ii) training centres and teachers, iii) companies and families*. These actors are the ones who give solidity and efficiency to the Vocational Education and Training System.

This **alliance** between these three actors is particularly important because of the dual nature of VET. The effective commitment of enterprises and the role of educators are particularly important for its success. However, its social and entrepreneurial success depends on its extension to all the small and medium-sized enterprises that make up the business sector.

Tools

For enhancing the role of supporting ecosystems and coordination between key actors (*social agents, institutions and entities, especially local corporations, professional associations, non-governmental organisations, and other business and trade union entities*), long-term strategic alliances can be generated in the VET system.

The following initiatives are proposed:

- **Signing of an agreement** between the collaborating entity, the educational administration and the labour administration for the organisation and development of the learning programmes.
- Regular **discussion chairs, research projects and observatories**;
- Collaborating with **sectoral or thematic forums and associations**;
- **Focus groups** to validate the content of the learning programmes proposed in order to get a more detailed insight into the content.

Supportive ecosystems, and especially companies are aware that the development of their activity has an impact on their stakeholders and on the environment in which they operate. Within this framework, they are increasingly reaffirming their commitment to support and contribute positively to the development of society.

Education is a completely cross-cutting area of action that affects all companies and countries. Companies *-as any other relevant actor in the education field-* can support training and job orientation programmes accessible to the most vulnerable groups, aimed at:

- minimising school failure and reintegration into the labour market;
- encourage corporate volunteering aimed at bridging the gap between education and the labour market;
- promote initiatives to improve access to education in the least developed areas where companies operate.

All these actions can become an intangible asset of strategic value for supporting ecosystems, as well as an opportunity to influence the VET system

through collaboration in the development of Sustainable Learning Programmes that are inclusive, green and digital.

The following section will now introduce the next stage of the methodology which focuses on the development aspect of sustainable learning programmes.

3.4 Stage 3: Development

The purpose of the Development Stage is actually to produce the content for the sustainable learning programmes. In this phase, the Vocational Education and Training educator will refine the initial draft created in the Design Stage in order to be able to develop a sustainable learning environment and therefore meet the instructional objectives planned in the earlier stages of this Methodology.

Objectives

- To provide VET teachers, trainers, mentors or coaches with a uniform reference structure for developing sustainable learning programmes.
- To provide VET teachers, trainers, mentors or coaches with a clear set of instructions or a detailed guide consisting of requirements, practices and tools for the development of inclusive, digital and green learning programmes.
- Facilitate the development of apprenticeship programmes that ensure access for marginalised groups and facilitate the transition to work for disadvantaged learners.
- Support the development of apprenticeship programmes that integrate environmental sustainability into their practices.

Expected outcomes

- Understanding of the requirements, practices and tools involved in developing sustainable learning programmes.
- Identification and implementation of measures to ensure inclusive, digital, green and ecosystem-supportive programme development.
- Use of the reference guide to develop a plan for the overall structure of sustainable learning programmes.
- Assessment of the programme design being developed against the requirements set to ensure its inclusiveness, digitisation, green element and facilitation of the supporting ecosystem.

Activities

This section describes the steps involved in the development of learning programmes.

1. Description:

1.1. Brief description of the topic and general characteristics of the learning programme. Relate the learning programme to the different general objectives of the curriculum and to the rest of the learning pathway. Take into account the characteristics of the Vocational Education and Training centre in which it will be taught, as well as the level for the year in which it is to be carried out, and previous experience.

1.2. Justification. The reason for the choice of the topic and its relation to the rest of the learning pathway.

2. Elements of the learning programme:

2.1. Title. Define a stimulating title.

2.2. The learning objectives, expressed in terms of competences (between 6 and 8).

2.3. The content to be learnt. The contents are taken from the objectives.

The development of learning content comprises three main steps:

A. Content: writing or collecting all the required knowledge and information.

B. Storyboard: organizing the content into a structure by choosing appropriate instructional methods and creating a storyboard, i.e., an intermediate product where all the components of the final object are defined, including images, text, interactions and assessment tests.

C. Completion: generating the final version in the required delivery format(s).

Tips for developing the content of a learning programme:

- Explain as clearly and precisely as possible what the addressee should do.
- Use only clear and precise words and concepts.
- Avoid constructing complex sentences.
- Avoid filler words, which have no function in the task statement.
- Avoid double negation.
- Avoid unnecessary and disproportionate precision in task statements and answers.
- Avoid unnecessary difficulties unrelated to the criterion to be measured.

- Avoid indirect expressions that facilitate the correct answer, even without technical knowledge.
- Avoid stereotypes and repetitive formulations.
- Design the learning environment in such a way that learners are able to see the outcome or end product of the work.
- Show learners what happens to the outcome of their work once the task is completed.
- Inform learners about the amount of time they have to complete the task.
- Inform learners where they can get help if they are unable to complete the task on their own.
- Make sure that the learning programme is appropriate, i.e., neither too complex, nor too simple (according to Herbig, 1972: 96-100; Grell & Grell, 1990: 273).

2.4. Activities, strategies and time. Procedures to be followed so that students learn the content. Here the number of sessions established will have an influence. In the activities it is necessary to reflect and work on all the procedures and, furthermore, it is necessary to give them a character of continuity with the rest of the learning pathway.

2.5. Material resources needed. Indicate the materials needed to deliver the learning programme.

2.6. Curricular adaptations. The activities with which the objectives are to be achieved.

2.7. Organisation of space and time. Indicate the number of sessions and the format in which they will be conducted.

2.8. Evaluation. The criteria that will be required as a minimum, assessment of attitudes, and assessment of the teaching-learning process and performance.

It is also important at this stage that the VET educator conducts a pilot / test of the learning programme for quality assurance. If the pilot / test is favourable, the

educator should proceed with implementation; if not however, they should amend and redesign it.

The above section described the activities required for the development of learning programmes. The following section will now highlight the requirements, practices and tools needed to ensure that the learning programme is inclusive.

Inclusive Perspective

Requirements

Similarly to previous sections it is important to keep in mind what inclusion actually is and what an educator needs to pay attention to in order to make his practice as inclusive as possible.

Therefore to recap:

An inclusive learning environment, enables all students, regardless of their circumstances, to enjoy the fullest possible learning experience. It benefits all students because it values their individual strengths and contributions and makes the learning experience richer and more diverse for everyone (Hockings, C. (2010)).

A VET educator should pay attention to the following factors in order to make his teaching more inclusive:

- Respect the diversity of students and the variety of ways that they learn.
- Enable all students to take part in learning and fulfil their potential.
- Ensure different students' learning needs are met, regardless of their backgrounds, learning styles and abilities.
- Remove any barriers that prevent students from learning.

Inclusive teaching also means not discriminating against students – directly or indirectly – because of their:

- age
- disability
- gender reassignment

- marriage and civil partnership
- pregnancy and maternity
- race
- religion or belief (including lack of belief)
- sex
- sexual orientation.

To ensure that this stage of the programme design responds to the needs of diverse groups of learners, including marginalised groups and disadvantaged learners, as well as taking into consideration proper measures to foster gender equality, VET teachers should support their teaching practices by an inclusive teaching methodology (UNESCO, 2013). This includes:

- teaching methods and skills – ensuring that the methods of teaching and learning are flexible, learner-centred and inclusive of diverse needs; that students are supported to develop their own locally relevant resources, and that they are supported to understand and engage in formative forms of assessment;
- students receive proper, ongoing support throughout their learning process.
- teachers and students reflect continuously on their learning journey in order to spot any gaps or areas that require attention and reassessment as to the way they are being passed on from teacher to learner, to achieve the maximum of the learning experience.
- taking a systematic approach to welcoming diversity and identifying barriers to inclusive education
- promoting and facilitating learner-centred teaching
- employing interactive and varied teaching and learning approaches, and avoiding the overuse of methods which are inappropriate for some learners
- using approaches to teaching which encourage teachers to innovate and adapt curricula and materials to fit local contexts
- engaging in formative and authentic forms of assessment
- developing personalised learning approaches for students
- ensuring good quality supervision and support for students

- engaging in reflective and reflexive teaching practice to enhance inclusive teaching competencies.

Requirement 1: Re-assessment of Tools and Educational Material

Following on from the design section, the first step in the development process should be a re-assessment of the available tools and educational material. The VET educator should make sure there are enough and appropriate resources to meet the aims and objectives set for the targeted group of people, for every student to acquire the maximum from the learning experience depending on his individual needs.

Requirement 2: Assessment Tools

The educator should make sure he has the appropriate assessment tools that will be used to assess whether the students are progressing and acquiring the appropriate knowledge based on the initial aims and objectives set at the start of the learning programme. The educator should design their own assessment questions and activities, using a variety of tools that cover the range of learning needs of his students. Aims and objectives should be re-evaluated to check whether or not they need to be altered in any way, or whether the students are learning and progressing.

Requirement 3: Student Independence

The educator should make sure that by the end of the learning course, the students are ready to act independently. The VET educator should be ready to support all students in presenting what they have learned in their own unique way to their peers and to the local community taking into account any difficulties they might face or any special support each of the students might need.

Practices

Practice 1: Re-assessment of Tools and Educational Material

The educator should, after re-assessing the tools and resources, structure them in such a way so that the educational material covers the aims and objectives of the learning course. In doing so they should keep in mind the individual differences and difficulties of the students.

Practice 2: Assessment Tools

Similarly to the educational material and resources, the educator should develop the assessment material and place them at the appropriate place within the timeframe of the learning course, to make sure that all students are following and learning and that no student falls behind. The assessment material should be of the appropriate form and structure to accommodate the learning style of every student.

Practice 3: Student Independence

The educator could assign particular projects, based on the material the students have learned. These could either be assigned in groups or individually. The educator should again pay attention to the particular learning needs of his students. If a student needs extra assistance, the educator could assign one of their fellow peers as a “buddy”, who will support the learner when needed. The educator should do their own personal research, and design tailored exercises and activities that will allow students to demonstrate in real life what they have learned during the course.

Tools

Tool 1: Online Resources

Educators can use online organisational tools and templates to arrange their educational material, in ways which are clear to see and follow through.

Some ideas are:

- Jotform
- Planbook
- Planboard
- iDoceo
- Google Classroom
- Common Curriculum
- OnCourse
- Standards Planner
- PlanbookEdu

- Teachers.io

In case that an educator has no access to the internet or finds it difficult to use online resources, they can create a manual template and arrange their educational material manually on paper.

Tool 2: Online Applications for Assessments

To assess student progress, an educator can once more use online applications to do so.

Some ideas are:

- **Kwiksurveys** - This is a great tool for creating custom polls, surveys, and quizzes that can be instantly shared through social media, or posted to teacher websites or blogs.
- **ClassMaker** - Through ClassMaker, teachers can create secure online quizzes and exams that feature multiple question types, such as multiple choice, short answer, and essay. Tests are automatically graded and are perfect for classrooms, online courses, E-learning, and study groups.
- **Testmoz** - This free test generator offers multiple question types, automatic grading, detailed reports, and a simple design. Additionally, tests are pass code protected, but it does not require students to register to take the tests.
- **Mentimeter** - Mentimeter enables teachers to send out questions to students and allow them to instantly vote on them or send feedback through mobile phones or tablets. This is a great way to democratise the classroom by voting on topics or activities, and a very effective tool for issuing pop quizzes.
- **Knowledge** - Teachers can create and share tests with not only students, but with other teachers as well. This gives teachers multiple test resources and also promotes student understanding, as it randomises test questions and answers, allowing students to take tests multiple times without making the material stagnant.

Tool 3: Plan

For the last face of the learning course, at which students will be asked to demonstrate what they have learned, the educator can develop a plan in which students are separated in mixed groups, making sure people who need extra support receive help, either from a peer or a professional.

The educator can brainstorm project ideas and tasks related to the curriculum that will be assigned to each group. To do so they can once more use online applications such as **Socrative**, or can even come up with their own creative scenarios and ideas that will allow students to demonstrate what they have learned. The educator can use creative tools, such as music, movement, art and theatre depending on the learning material and on what is expected from the students.

Alternatively, the VET educator can assign topics to groups of students and then allow students to act independently on how to best approach the topic assigned to them.

Finally the educator has to decide on the marking system that will be used to grade the students.

All of the above will be drafted either using an online application or manually using a template.

For every step of the process the educator has to keep in mind the factors mentioned at the top to make sure the proposed practices are inclusive and that they support the learning needs of all students.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is digital at this stage.

Digital Perspective

Requirements

Yet again, the purpose of the digital perspective is to ensure the learning programme enhances the digital competencies and skills for digital transformation, both for the educator and the learner. In recent years, there has been a rapid transformation in innovation and technological evolution. Digital transformation has been a recurring theme in reshaping society, the labour market and the future of work. Due to this rapid transformation, many of the now most in-demand occupations did not even exist 10 to 5 years ago (World Economic Forum, 2016). This is supported by the European Centre for the Development of Vocational Training (Cedefop, 2018), suggesting that technological changes are a major driver of changing skill needs for future work environments, with about 85% of all EU jobs needing at least a basic digital skills level. The recent Covid-19 pandemic further accelerated this transformation, with trends of online or hybrid working/learning models emerging in the labour market and educational environment. This in turn created the need for greater levels of digital capacity in education and training; to equip learners and future workforces with the necessary knowledge, skills and competencies in line with digital change (European Commission, 2020).

The following technological trends will need to be considered by educators for 2022 and beyond. Various sources are suggesting that these technological trends are rising in popularity in transforming education and training, as well as the future of work (Howell & O'Donnell, 2017; Newman, 2017; McGuire, 2018; Gupta, 2019; Zain, 2021; Bui, 2020 & 2022; Marr, 2022; Martin, 2022):

- **Virtual and Augmented Reality** - Virtual reality refers to a simulated experience within a computer-generated environment/digital classroom, where the learner can interact with others and become immersed in virtual learning via a virtual reality headset. Augmented reality helps to enhance the educator's instructions by creating an immersive/interactive experience for the learner through the integration of digital technology and the learner's environment in real-time.
- **Artificial Intelligence**

- **Gamification** - utilizing gaming technology as an instructional tool for teaching, training and learning; encouraging a more fun and engaging learning experience
- **Big Data** - this refers to the collection and analysis of complex and large data sets.
- **eLearning** - education and learning taking place through electronic/online means, utilising laptops, computers, tablets/iPads, and smartphones.
- **Personalised learning** - this considers how different students learn, prioritising the learner. The educational experience is customised/tailored specifically to cater to the learner's needs.
- **Cloud Computing**
- **Cyber security**
- **Robotics**
- **Animation** - this refers to the utilisation of moving images/cartoons for teaching and/or learning through storytelling and content which simulates real scenarios.

The following highlights the requirements for this stage in ensuring the digitalisation of educational practices.

Requirement 1: Digital Content / Content Creation

The first requirement in ensuring digitalisation of educational practices at the development stage refers to digital content and content creation. In the “Design Stage” a storyboard has been created to plan an overview of the learning programme, including modules, topics, learning activities, materials/tools, delivery methods, assessment methods etc. This step focuses on the actual development of the digital content, with a particular focus on the learning materials/tools. The VET educator will need to decide how the different learning materials/tools (e.g. videos, .pdfs, eBooks, quizzes, graphics, podcasts etc.) are to be sourced, captured, developed, managed, stored and whether they are to be developed in-house or be outsourced.

Requirement 2: Copyright Clearance & Licensing

The next requirement in ensuring the digitalisation of educational practices focuses on copyright clearance and licensing. This is extremely important in avoiding negative consequences associated with use of intellectual property / copyright infringement or plagiarism (e.g. penalty fines, legal action). Copyright is a legal right concerning the use of creative assets such as text, videos, photos, software etc., whereby the owner (original creator) reserves the right to control how it is used. To print, record or publish any copyrighted material, the educator will first have to obtain permission from the owner of the asset (receive clearance to use such). In the context of digital property, the VET educator may avail of software/online programs/tools for a specified time under a licensing agreement. However, there is an exemption to using copyrighted material specific to education (teaching/research) under “fair dealing / fair use”. This permits the educator to copy limited segments of a work provided that it is used for non-commercial purposes. It is good practice to provide an acknowledgement of the author and the title of the work (cite/reference the source). Over all it is recommended that the VET educator carefully reads any fine print before using anything to ensure compliance.

Requirement 3: Testing

The final requirement at this stage in ensuring the digitalisation of educational practices is subject to testing. This step is concerned with testing all prototypes, demonstrations, software, tools, equipment or materials etc. Debugging is a necessary step in testing any technological resources to ensure ease of access, use, and navigation of such. Testing is an essential component in ensuring that the VET educator is able to use any of digital tools or software, but also that any materials will be easily accessible and navigable to students across different devices, platforms and/or operating systems or browsers. This will also ensure that there are no delays or frustrations and reduce the risk of technical difficulties from arising when delivering the learning programme.

Practices

Practice 1: Digital Content / Content Creation

To fulfil the requirement on the actual development of digital content, the VET educator must commence by reviewing the instructional design storyboard

which was created as per the “Design Stage”. It is at the “Development Stage” that this is going to be more refined. During the “Design Stage”, the VET educator would have outlined all the learning materials/tools required for the learning programme, and now it is time to decide how those specific assets will be sourced, captured, developed, managed or stored. Following a review of the storyboard, the next step is planning. The VET educator needs to plan the purpose or the goal of the content, and then identify credible sources of information. Credible sources are fundamental in the education sector so it is recommended to use academic journals, books/eBooks, governmental documents, conference papers or credible videos for gathering information (have less newspapers, blogs etc. as main sources of information). It is also very important to cross-reference information to back-up arguments. Once information has been gathered, the VET educator must now develop the content. It is at this step that they will ultimately decide whether it can be developed in-house or if they will require external help via outsourcing. Finally, the educator will need to decide how the content will be managed or stored (e.g., uploaded and stored onto a Learning Management System).

Practice 2: Copyright Clearance & Licensing

To fulfil the above requirement regarding copyright clearance and licensing, the VET educator should yet again commence by reviewing the instructional design storyboard to identify any content, materials or tools which will be subject to copyright clearance and licensing. The educator needs to identify at this step whether any digital tools or software involved will require a license purchase or whether it is free to use for educational purposes by reading the “Licensing Agreement” or “Terms & Conditions” of said asset. The VET educator should also read national and international copyright laws to ensure that they are compliant in the use of any creative assets that form their digital content or materials. Any informative literature and sources used to support the formation of teaching materials should be referenced and cited. If heavily relying on incorporating third party materials into the learning programme, please ensure copyright clearance has been obtained to avoid prosecution of any kind.

Practice 3: Testing

To fulfil the requirement subject to testing, the educator should commence by reviewing the instructional design storyboard to identify any prototypes, content, demonstrations, software, tools, equipment, materials or other technological resources. Each of these should be tested as if delivering / putting such into practice / conducting a mock walkthrough. The educator should ensure that they keep a record of any issues/difficulties/comments while doing so and look into possible solutions or alternatives to ensure an optimum learning experience upon actual delivery.

Tools

Tool 1: Planning Template

To fulfil the content creation practice, the VET educator should draft a planning template using the instructional design storyboard as a reference source for required content. This document should be specific to the learning materials section, and contain the following headings for guidance: purpose/goal, information sources, text copy based on key information (introduction, main body, conclusion), development (highlight necessary tools/software for creation if creating in-house or the outsourcing stakeholder's details), management/storage.

Tool 2: Document Storage / File Management

To fulfil the copyright clearance and licensing practice, the VET educator should ensure that they have a digital copy of the copyright clearance and/or the licensing agreement documents stored. Having these documents is important for record-keeping, dispute resolution and compliance. Digital record keeping is beneficial as it reduces paper waste, it is more secure, easier to manage and access documents and it prevents the risk of vital documents being damaged, stolen or lost. To do so, the VET educator will require access to file management software. Some examples that VET providers may avail of to store these documents digitally include Windows Libraries, the cloud via OneDrive or Google Drive, a data management system such as eFileCabinet, Dokmee or PinPoint.

Tool 3: Testing Criteria

As previously mentioned, to fulfil the testing practice the VET educator should conduct a mock walkthrough in using any of the prototypes, demonstrations, content, software, tools, equipment, materials or other technological resources involved in the learning programme.

Each of these should be tested against the following criteria:

- Access
- Usability
- Navigation
- Privacy and Security
- Management and/or maintenance
- Performance
- User experience

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is green at this stage.

Green Perspective

Requirements

When creating programs for the green transition, things such as the climate crisis and the loss of biodiversity resulting from human activity need to be taken into consideration. The consequences of this crisis pose an existential threat globally. Some of these changes are already felt today and will be felt even more in the future. With the active engagement of the European Union, international commitments for climate action and sustainability have been made, such as the Paris Agreement and the UN's Sustainable Development Goals. Efforts continue, and a majority of countries have pledged to reduce greenhouse gas emissions, to help those who are already affected to adapt to climate change, and to provide financing for action. It is a call for immediate action to avert a climate catastrophe.

The way out lies in a swift and inclusive transition to environmentally sustainable lifestyles and economies. The green transition refers to the fundamental shift in production and consumption patterns to allow us to live within planetary

boundaries. It means mitigating climate change by introducing climate-friendly lifestyles and taking environmental costs into account. It includes addressing the loss of biodiversity and its multiple ecosystem services that are crucial to healthy living and to resilient societies. At the same time, the green transition must be fair and inclusive.

The green transition is an opportunity to unlock economic and societal benefits. Green technologies can provide economic and environmental win-win situations for both societies and economies. The green transition is an opportunity to transform today's unsustainable activities towards a just future; one that overcomes societal challenges such as growing disparities, and opens up avenues for competitive advantages of economic activities that provide solutions without exceeding the planetary boundaries.

Requirement 1: Green Content (Avoiding Rebound Effects)

Avoid rebound effects with awareness raising, adequate governance systems, and market mechanisms that avoid market failures which can mitigate unintended side effects of the implementation of green-digital solutions.

Requirement 2: Green-Digital Technologies

The educator should aim to reduce the environmental footprint of green-digital technologies with resource consumption. Emissions, and pollution of green-digital solutions have to be reduced throughout their entire life cycle.

Practices

At the development stage, the VET educator needs to ensure that the green content of the learning programme places emphasis on:

- Demand in shift to green products, and lower price for polluting products
- Greener and more efficient products, tempting higher rates of consumption of such
- Having a substantial resource footprint of digital technologies
- Difficult recyclability of digital devices
- High energy requirements of digital technologies

Tools

Tool 1: Tools to Avoid Rebound Effects

Rebound effects call for their own measures to reach the goals of the green transition. For example, teleworking might lead to increased housing space requirements, with an additional separate office room. Another possible rebound effect is that a greener alternative such as low-carbon transportation or green electricity might lead to an increase in demand, because they are perceived to be more environmentally-friendly than fossil fuel-based solutions. An increasing demand for green substitute products might lead to a lower demand for carbon-intensive products which would make them cheaper and in turn more competitive vis-a-vis their greener counterparts. Rebound effects could be avoided by implementing a variety of different measures. For example, education and awareness raising could address rebound effects that are caused by changes in consumer behaviour. In addition, there are also solutions to address rebound effects caused by market failures (that focus on short-term cost optimisation instead of long-term societal benefit), for example the introduction of standards and regulation to ensure that a minimum percentage of secondary materials is used in new products.

Tool 2: Tools For Reducing Environmental Footprint Of Green-Digital Technologies

Green technologies still have to be further developed to reduce their environmental impacts. Technologies required for the green and digital transitions have their own environmental footprints. Wind turbines require steel and copper. Distributed Ledger technologies and Artificial Intelligence use substantial amounts of electricity, and RFID chips require resources and are difficult to recycle. There is also the issue of hazardous waste from some of the green-digital technologies. To ensure that these solutions are not negating their positive environmental effect, research and innovation has to keep the whole life cycle of these technologies in mind to optimise these life cycles for environmental performance. Regulatory policies could also support the uptake of technologies with a lower environmental footprint.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program supports ecosystems at this stage.

Supportive Ecosystems Perspective

Requirements

The COVID-19 crisis has increased the urgency of guaranteeing quality education in Vocational Education and Training (VET) that promotes the training of employees, improves the employability of recent graduates, and promotes training programmes for the most vulnerable groups.

Therefore, education and training needs to be tailored to the demands of the current environment, which implies the continuous updating of the professional modules of the learning programmes, adapting them to the demands of the productive system with the perspective of the requirements of sustainable development.

The above is aligned with Sustainable Development Goal number four (SDG 4) of the United Nations 2030 Agenda, a priority for public administrations and supporting ecosystems which aims to achieve universal access to quality education throughout life and promote technical training, eliminating economic and gender barriers that are a source of inequalities.

Developing initiatives based on the union of forces and efforts that contribute to achieving this goal is key to overcoming poverty, favouring the reduction of inequality, improving social and environmental awareness and being a driving force for the economy and innovation.

Improving collaboration between higher education and Vocational Education and Training institutions or collaboration between the educational administration, social and economic agents in order to favour entrepreneurial initiatives and innovation, are essential in order to achieve this objective. These structural alliances or partnerships will enable faster progress in the process of change towards sustainable development, as well as favouring good practices in their immediate local and regional environments.

In other words, companies and social agents must be involved in the development of VET programmes, with the aim of reinforcing strategies for change towards a new development model and the incorporation into training of factors that contribute to social cohesion and development. Thus, agreements can be reached to promote a culture of responsibility and the commitment of supporting ecosystems to education and sustainable development.

Practices

Preliminary questions:

- **Eligibility criteria:** *Does the stakeholder influence the teaching process?*
- **Relevance criteria:** *Can the stakeholder change the learning process?*
- **Impact criteria:** *Will the stakeholder contribute to the long-term success of the VET institution?*

The **participation** of social agents, the different administrations and other actors in the identification and updating of qualification needs, as well as the training required, ensures the value of qualifications in the labour market.

Public-private **collaboration** and, in particular, the participation of companies in the definition of skills profiles and the establishment of learning programmes is essential to ensure that Vocational Education and Training is of quality and meets the demands of the labour market.

The success of an effective VET System requires a close alliance, **cooperation** and **trust** between three actors: *i) administrations, ii) training centres and teachers, iii) companies and families*. These actors are the ones who give solidity and efficiency to the Vocational Education and Training System.

This **alliance** between these three actors is particularly important because of the dual nature of VET. The effective commitment of enterprises and the role of educators are particularly important for its success. However, its social and entrepreneurial success depends on its extension to all the small and medium-sized enterprises that make up the business sector.

Tools

For enhancing the role of supporting ecosystems and coordination between key actors (*social agents, institutions and entities, especially local corporations, professional associations, non-governmental organisations, and other business and trade union entities*), long-term strategic alliances can be generated in the VET system.

The following initiatives are proposed:

- **Signing of an agreement** between the collaborating entity, the educational administration and the labour administration for the organisation and development of the learning programmes.
- Regular **discussion chairs, research projects and observatories**;
- Collaborating with **sectoral or thematic forums and associations**;
- **Focus groups** to validate the content of the learning programmes proposed in order to get a more detailed insight into the content.

Supportive ecosystems, and especially companies are aware that the development of their activity has an impact on their stakeholders and on the environment in which they operate. Within this framework, they are increasingly reaffirming their commitment to support and contribute positively to the development of society.

Education is a completely cross-cutting area of action that affects all companies and countries. Companies *-as any other relevant actor in the education field-* can support training and job orientation programmes accessible to the most vulnerable groups, aimed at:

- minimising school failure and reintegration into the labour market;
- encourage corporate volunteering aimed at bridging the gap between education and the labour market;
- promote initiatives to improve access to education in the least developed areas where companies operate.

All these actions can become an intangible asset of strategic value for supporting ecosystems, as well as an opportunity to influence the VET system

through collaboration in the development of Sustainable Learning Programmes that are inclusive, green and digital.

The following section will now introduce the next stage of the methodology which focuses on the implementation of sustainable learning programmes.

3.5 Stage 4: Implementation

Implementation focuses on how the project will achieve its set objectives. It provides the framework for carefully designing rules and efficient processes, allowing the project to deliver its objectives in a way that is as efficient and user-friendly as possible.

Objectives

The main objective is to provide VET providers with tools and instructions in order for them to be able to create innovative programs which are inclusive, digital and green.

In more detail, it will provide a set of principles, tools, and practices for VET providers to develop courses and programs by following a guided pathway that requires them to include measures to:

- Ensure access to the course/program for marginalized groups and ease the transition to work for disadvantaged learners
- Foster gender equality and challenge gender stereotypes within their practices and materials
- Assure that learners acquire the basic, transversal and technical skills needed to thrive in fast-changing economic scenarios and in the green economy of the future
- Integrate environmental sustainability in their practices
- Engage relevant stakeholders into a wider supportive ecosystem, which can support the continuous improvement of learning practices and methods, with more agility
- to adapt to the dynamic labour market needs.

Expected outcomes

By carefully following the guidelines and using the tools and resources provided, users will be able to develop, together with their learners, their own learning material that will be in line with the principles promoted by the current project (inclusive, green, digital, in line with current market needs).

Activities

The main activity of the implementation stage focuses on the actual delivery of the learning programme.

A range of interactive tools and audio-visual resources will be used in order to make the process as user friendly as possible.

The users will be guided through gradual steps and activities that will aim to equip them with the knowledge and the tools needed to create their own learning material.

The knowledge acquired will be evaluated through multiple choice and open-ended questions which will lead to the completion of different modules and the acquisition of a certificate at the end of the whole course.

All the material will be provided for free to users who subscribe to the course and will be available after the end of the course for the whole duration of the project. Users will also have the possibility to download material that they may find useful.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is inclusive at this stage.

Inclusive Perspective

Requirements

In line with the previous parts of the methodology, the educator should keep in mind all the factors that make a practice inclusive when implementing the learning material.

Requirement 1: Review

During the implementation phase, the educator will see the chosen educational material in practice and will therefore be able to see whether or not students respond to the material in the way the educator had imagined they would when designing the structure of the learning course.

Requirement 2: Assessment Methods

When assessing students to see whether they have been learning and are able to follow the educational material, the educator should once more make sure that the methods they use to assess students are inclusive and learner - centred, in a way that is non- threatening to the students and that allows them to demonstrate what they know. To achieve this the educator can use online applications (mentioned in the previous section) or come up with their own method of assessment, using a variety of tools and ways to assess the knowledge of students. The VET educator should again evaluate whether the tools and resources are effective in practice with the current group of students.

Requirement 3: Student Initiative

At the final stage, the educator gives the stage to the students and allows them to demonstrate what they have learned. Depending on how the educator chooses to do so, either in groups with different tasks/ themes/ projects, or by using online applications and made - up scenarios, the trainer should once more assess their methods to make sure it does not discriminate against any student, in any manner. The educator should make sure students that need extra support do so, either in their team, by a special needs professional, or through the educators support.

When evaluating the results of the final tasks/ projects, they should again make sure that marking criteria are both fair and inclusive and that no student is left feeling incapable.

Practices

Practice 1: Review

The educator needs to keep re - evaluating all the educational material that were chosen, making sure they are as inclusive and effective as possible and that they accommodate the educational needs of every student in the class.

The educator needs to make sure the material used is culturally, age and gender appropriate, in a way that all students can relate to them and that they do not by any means exclude or discriminate against any student.

The material should also be at the appropriate level of the students and be adjustable to those students with extra learning needs.

Practice 2: Assessment Methods

When assessing students, the educator should once more make sure that the methods used are inclusive and learner - centred, in a way that is non-threatening to the students and that allows them to demonstrate what they know. To achieve this the educator can use online applications (mentioned in the previous section) or come up with their own method of assessment, using a variety of tools and ways to assess the knowledge of the students.

The teacher should again evaluate whether the tools and resources are effective in practice with the current group of students.

To make sure the educator has a reference point that makes it easier for them to keep track of whether the practice is inclusive, they can make a list of important factors that they have to keep in mind when making the assessment (gender , culture, learning disabilities, age, learning style, communication style etc.) .

Practice 3: Student Initiative

At the final phase, the educator gives the stage to the students and allows them to demonstrate what they have learned. Depending on how this is chosen to do so, either in groups with different tasks/ themes/ projects, or using online applications and made - up scenarios, the teacher should once more assess their method to make sure it does not discriminate against any student, in any manner. They should make sure students that need extra support do so, either in their team, by a special needs professional or through the educator's support.

When evaluating the results of the final tasks/ projects the trainer should again make sure their marking criteria are both fair and inclusive and that no student is left feeling incapable.

They can keep referring back to the list of important factors created that should be present for the practice to be considered inclusive and keep adjusting and making changes where needed.

Tools

Tool 1: Review

To assess whether or not the material the educator has chosen is appropriate and inclusive, the educator can share their material with other co-workers to receive feedback and extra ideas on how to make the practices more inclusive. This can be done face to face or through online communication platforms designed specifically for educators. One example of this is **Craft and SMEs VET NET platform**.

The educator can also assess the appropriateness of the material chosen through personal observations of how students react to them in the classroom.

Tool 2: Assessment Methods and Tools

To assess the progress of students, the educator has to make sure the assessment methods and tools used are inclusive in a way that allows every student to demonstrate what they have learned.

Some ideas of tools and applications, also mentioned in previous sections, are:

- **Kwiksurveys** - This is a great tool for creating custom polls, surveys, and quizzes that can be instantly shared through social media, or posted to teacher websites or blogs.
- **ClassMaker** - Through ClassMaker, teachers can create secure online quizzes and exams that feature multiple question types, such as multiple choice, short answer, and essay. Tests are automatically graded and are perfect for classrooms, online courses, E-learning, and study groups.
- **Testmoz** - This free test generator offers multiple question types, automatic grading, detailed reports, and a simple design. Additionally, tests are pass code protected, but it does not require students to register to take the tests.

- **Mentimeter** - Mentimeter enables teachers to send out questions to students and allow them to instantly vote on them or send feedback through mobile phones or tablets. This is a great way to democratise the classroom by voting on topics or activities, and a very effective tool for issuing pop quizzes.
- **Knowledge** - Teachers can create and share tests with not only students, but with other teachers as well. This gives teachers multiple test resources and also promotes student understanding, as it randomises test questions and answers, allowing students to take tests multiple times without making the material stagnant.

Once more, the educator can design their own assessment tools and criteria, keeping in mind always that the chosen methods are inclusive. To check the appropriateness of the chosen methods the trainer can, once more, ask for the opinion of fellow co-workers.

Tool 3: Student Initiative

To assess students' knowledge at the end of the course and make sure they can apply the knowledge they have learned, the educator can provide some real life scenarios and situations through which students can demonstrate their knowledge. To make sure this part is as inclusive as possible, the educator should make sure students are provided with a variety of different tools and modalities which they can use to their benefit. Also, if using made - up scenarios, the educator has to make sure that students can find role models to whom they can relate to and that no scenario discriminates against any student by any means either directly or indirectly. The educator has to make sure students that need extra support do so, either by supplying them with a peer as a "buddy" or by the help of a specialist.

Throughout the process the educator has to keep an eye for any student that feels left out and that cannot keep up. In this case the educator has to be prepared to provide alternative solutions which are appropriate to the learning needs of the student.

When assessing the final result of the task/project, the educator has to make sure that the marking criteria are in line with inclusive practice and that they take into consideration the special needs of each of the students.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is digital at this stage.

Digital Perspective

Requirements

The purpose of the digital perspective is to ensure the learning programme enhances the digital competencies and skills for digital transformation, both for the educator and the learner. In recent years, there has been a rapid transformation in innovation and technological evolution. Digital transformation has been a recurring theme in reshaping society, the labour market and the future of work. Due to this rapid transformation, many of the now most in-demand occupations did not even exist 10 to 5 years ago (World Economic Forum, 2016). This is supported by the European Centre for the Development of Vocational Training (Cedefop, 2018), suggesting that technological changes are a major driver of changing skill needs for future work environments, with about 85% of all EU jobs needing at least a basic digital skills level. The recent Covid-19 pandemic further accelerated this transformation, with trends of online or hybrid working/learning models emerging in the labour market and educational environment. This in turn created the need for greater levels of digital capacity in education and training; to equip learners and future workforces with the necessary knowledge, skills and competencies in line with digital change (European Commission, 2020).

The following technological trends will need to be considered by educators for 2022 and beyond. Various sources are suggesting that these technological trends are rising in popularity in transforming education and training, as well as the future of work (Howell & O'Donnell, 2017; Newman, 2017; McGuire, 2018; Gupta, 2019; Zain, 2021; Bui, 2020 & 2022; Marr, 2022; Martin, 2022):

- **Virtual and Augmented Reality** - Virtual reality refers to a simulated experience within a computer-generated environment/digital classroom, where the learner can interact with others and become immersed in virtual learning via a virtual reality headset. Augmented reality helps to enhance the educator's instructions by creating an immersive/interactive experience for the learner through the integration of digital technology and the learner's environment in real-time.
- **Artificial Intelligence**
- **Gamification** - utilizing gaming technology as an instructional tool for teaching, training and learning; encouraging a more fun and engaging learning experience
- **Big Data** - this refers to the collection and analysis of complex and large data sets.
- **eLearning** - education and learning taking place through electronic/online means, utilising laptops, computers, tablets/iPads, and smartphones.
- **Personalised learning** - this considers how different students learn, prioritising the learner. The educational experience is customised/tailored specifically to cater to the learner's needs.
- **Cloud Computing**
- **Cyber security**
- **Robotics**
- **Animation** - this refers to the utilisation of moving images/cartoons for teaching and/or learning through storytelling and content which simulates real scenarios.

The following highlights the requirements for this stage in ensuring the digitalisation of educational practices.

Requirement 1: Prior Training

To ensure the digitalisation of educational practices at the implementation stage, the VET educator or any facilitators should receive prior training with instructions for successful delivery. This is important in ensuring that the trainer (s) are fully equipped with digital knowledge or skills to provide appropriate

support and feedback to their learners in relation to any of the digital aspects of the learning programme.

Requirement 2: Delivery & Assessments

This requirement is concerned with the actual delivery of the learning programme. Once the learning programme is launched, it is important that the learners are fully briefed on what the learning programme entails – the aim and objectives, the learning outcomes, topics, delivery, and assessments etc. This will help the learner to prepare for what is to come. Students will be briefed on what is expected of them and how they will be assessed to test whether they have acquired the necessary digital knowledge, competencies and skills. It is also important at this stage that the VET educator ensures that the learners are engaged in the programme delivery, that they receive any support they may need, and that the learner performance and experience is constantly monitored.

Requirement 3: Marketing

Another important requirement to be considered at the implementation stage regards the marketing of the learning programme. Once the learning programme is approved and made live, it will need to be marketed to the target audience (learners) to encourage them to sign up for the programme. Marketing activities should highlight the learning programme description, any entry requirements, opportunities or career prospects, who it is for and what it entails. To ensure the digitalisation of educational practices at this step, the VET educator should highlight the digital components of the learning programme.

Practices

Practice 1: Prior Training

To ensure the fulfilment of the training and briefing requirement at this stage, the VET educator should conduct any reskilling, upskilling or further training to ensure they are well equipped with digital skills and knowledge for the successful delivery of the learning programme. This will prepare the VET educator in answering any questions the learners may possibly have, help them to make more informed decisions and better accommodate their learners. This can be achieved by completing short courses, attending sector specific

conferences or training workshops. It is good practice for the VET educator to conduct frequent or ongoing reskilling/upskilling due to the rapid changes in technological growth and development.

Practice 2: Delivery & Assessments

To ensure that learners are fully briefed on the contents of the learning programme, the VET educator can highlight what the programme entails by uploading an overview of the programme onto the learning management system. By making the programme overview available on the learning management system, the learner will be able to digitally access the information at any stage. The VET educator should also go through all the sections of the overview of the learning programme to ensure the learners have a good understanding of what is expected of them, and the types of assessments the learners will need to undertake for successful completion of the programme.

Practice 3: Marketing

Once the learning programme is made live, the VET educator should ensure that it is marketed effectively to the target audience to encourage sign ups. This is important as without awareness of the learning programme, there will not be any students to participate in it which will ultimately lead to it getting dropped by the educational provider (e.g. no demand means no income to cover associated expenses). The VET educator can ensure digital practices at this step either by marketing the learning programme via digital means or by showcasing the digital aspects of it (e.g. a demonstration of using digital technology such as a Virtual Reality headset or a walkthrough of a gamified platform). The educator should commence by conducting market research to clearly define their target audience for the learning programme, and to identify the best mediums to reach them.

Tools

Tool 1: Prior Training

As previously mentioned, to fulfil this practice the VET educator may complete a short course, attend a sector specific conference or a training workshop to ensure that they are equipped with the necessary digital skills and knowledge for successful delivery of the learning programme. To do so, the VET educator

may avail of training on platforms such as LinkedIn Learning, participate in self-paced free/paid online courses (on platforms such as Coursera, Alison or FutureLearn) or attend workshop events (some may be CPD accredited).

Tool 2: Learning Management System

In delivering the learning programme, the VET educator will need a platform to store all teaching and learning or supportive materials in one place where such will be accessible to students throughout the duration of the programme. This would include details about the programme, information regarding assignments, supporting notes on topics etc. The educator should therefore ensure that all relevant materials are uploaded onto one learning management system, that the location of all materials is clearly communicated to the learners and that they are easily accessed by the students. Examples of some learning management systems include Moodle, Google Classroom, Docebo, Canvas and Edmodo.

Tool 3: Market Research & Dissemination

To fulfil the marketing practice, the VET educator will need to commence by conducting market research to clearly define their target audience for the learning programme, and to identify the best mediums for reaching them. To conduct market research, the educator may avail of tools such as SurveyMonkey to gather insights on their market by conducting surveys, or alternatively avail of platforms such as Google Trends or Statista for insights on existing trends. Once this information has been obtained, the VET educator may then make an informed decision on the best medium for reaching the target audience. As previously mentioned, the educator may incorporate digital practices at this step by marketing the learning programme through digital means or by showcasing its digital aspects.

The learning programme can be marketed through digital means by:

- Website marketing
- Mobile marketing (or advertising via mobile applications)
- Search engine optimisation

- Online advertising (search engine adverts - Google Ads, display advertising – banners or pop-ups)
- Organic/paid campaigns on social media platforms (e.g. LinkedIn, Instagram, Twitter, Facebook, TikTok etc.)
- Email marketing (e.g. newsletters)
- Online promotion via Student Ambassadors

The digital aspects of the learning programme can be marketed on open days through experiential marketing (marketing focused on experiences). For example, a student can be involved in creating a small 3D print, a student could participate in a Virtual Reality demonstration or by trying an application.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is green at this stage.

Green Perspective

Requirements

To have useful and results-orientated programmes, it is necessary to think how to design sustainability-oriented learning venues in companies.

For scientific support, an orientation framework should be developed in the form of a structural model to show suggestions for the design of company framework conditions to promote VET for sustainable development. The framework needs to focus on the workplace as a learning venue. With this in mind, the term learning venue is differentiated into three levels: First, the meta-learning venue is understood as the training enterprise, as an institution where learning takes place. Other meta-learning venues can be vocational schools or inter-company vocational training centres. Second, within different meta-learning venues, several learning venues can be identified, which are referred to as learning environments. The third level is the teaching/learning situation, which ultimately focuses on learning itself.

In addition to these three levels, the implementation stage needs to:

- Ensure just green transitions
- Increase societal commitment to the need to green change
- Ensure diversity of market players

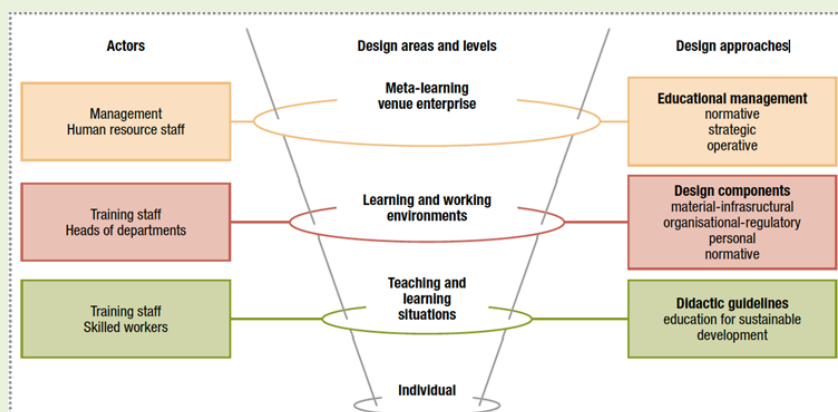
Practices

To fulfil the above requirements, the VET educator needs to consider the following:

- Risk of energy poverty
- Unequal access to green subsidies
- Unequal opportunities created by the twin transitions
- Digital divide (between social groups and regions)
- Green efforts focusing on marginal improvements instead of step changes
- No sense of urgency to implement the green transition
- Focus only on economic instead of environmental aspects also
- Reluctance to change habits
- Green lifestyle questions status symbols
- Established values
- Increasing technological capacity being difficult to manage for small players

Tools

Framework for designing sustainability-oriented learning venues in enterprises



The following section will now highlight the requirements, practices and tools needed to ensure that the learning program supports ecosystems at this stage.

Supportive Ecosystems Perspective

Requirements

The COVID-19 crisis has increased the urgency of guaranteeing quality education in Vocational Education and Training (VET) that promotes the training of employees, improves the employability of recent graduates, and promotes training programmes for the most vulnerable groups.

Therefore, education and training needs to be tailored to the demands of the current environment, which implies the continuous updating of the professional modules of the learning programmes, adapting them to the demands of the productive system with the perspective of the requirements of sustainable development.

The above is aligned with Sustainable Development Goal number four (SDG 4) of the United Nations 2030 Agenda, a priority for public administrations and supporting ecosystems which aims to achieve universal access to quality education throughout life and promote technical training, eliminating economic and gender barriers that are a source of inequalities.

Developing initiatives based on the union of forces and efforts that contribute to achieving this goal is key to overcoming poverty, favouring the reduction of inequality, improving social and environmental awareness and being a driving force for the economy and innovation.

Improving collaboration between higher education and Vocational Education and Training institutions or collaboration between the educational administration, social and economic agents in order to favour entrepreneurial initiatives and innovation, are essential in order to achieve this objective. These structural alliances or partnerships will enable faster progress in the process of change towards sustainable development, as well as favouring good practices in their immediate local and regional environments.

In other words, companies and social agents must be involved in the development of VET programmes, with the aim of reinforcing strategies for

change towards a new development model and the incorporation into training of factors that contribute to social cohesion and development. Thus, agreements can be reached to promote a culture of responsibility and the commitment of supporting ecosystems to education and sustainable development.

Practices

Preliminary questions:

- **Eligibility criteria:** *Does the stakeholder influence the teaching process?*
- **Relevance criteria:** *Can the stakeholder change the learning process?*
- **Impact criteria:** *Will the stakeholder contribute to the long-term success of the VET institution?*

The **participation** of social agents, the different administrations and other actors in the identification and updating of qualification needs, as well as the training required, ensures the value of qualifications in the labour market.

Public-private **collaboration** and, in particular, the participation of companies in the definition of skills profiles and the establishment of learning programmes is essential to ensure that Vocational Education and Training is of quality and meets the demands of the labour market.

The success of an effective VET System requires a close alliance, **cooperation** and **trust** between three actors: *i) administrations, ii) training centres and teachers, iii) companies and families*. These actors are the ones who give solidity and efficiency to the Vocational Education and Training System.

This **alliance** between these three actors is particularly important because of the dual nature of VET. The effective commitment of enterprises and the role of educators are particularly important for its success. However, its social and entrepreneurial success depends on its extension to all the small and medium-sized enterprises that make up the business sector.

Tools

For enhancing the role of supporting ecosystems and coordination between key actors (*social agents, institutions and entities, especially local corporations,*

professional associations, non-governmental organisations, and other business and trade union entities), long-term strategic alliances can be generated in the VET system.

The following initiatives are proposed:

- **Signing of an agreement** between the collaborating entity, the educational administration and the labour administration for the organisation and development of the learning programmes.
- Regular **discussion chairs, research projects and observatories**;
- Collaborating with **sectoral or thematic forums and associations**;
- **Focus groups** to validate the content of the learning programmes proposed in order to get a more detailed insight into the content.

Supportive ecosystems, and especially companies are aware that the development of their activity has an impact on their stakeholders and on the environment in which they operate. Within this framework, they are increasingly reaffirming their commitment to support and contribute positively to the development of society.

Education is a completely cross-cutting area of action that affects all companies and countries. Companies *-as any other relevant actor in the education field-* can support training and job orientation programmes accessible to the most vulnerable groups, aimed at:

- minimising school failure and reintegration into the labour market;
- encourage corporate volunteering aimed at bridging the gap between education and the labour market;
- promote initiatives to improve access to education in the least developed areas where companies operate.

All these actions can become an intangible asset of strategic value for supporting ecosystems, as well as an opportunity to influence the VET system through collaboration in the development of Sustainable Learning Programmes that are inclusive, green and digital.

The following section will now discuss the final stage of the methodology concerned with the evaluation of sustainable learning programmes.

3.6 Stage 5: Evaluation

The purpose of the Evaluation Stage is to assess and evaluate the contents of the entire learning programme. The evaluation phase can be broken into two parts, formative and summative. The formative phase occurs at every stage during the development of the learning programme, whereas the summative phase occurs at the end of the programme (Stapa & Mohammad, 2019). The main aim of this stage is to ensure that the goals of the learning programme have been met, and that areas for re-design and improvement have been identified to further enhance the learning experience.

Objectives

- To provide Vocational Education and Training teachers, trainers, mentors or coaches with a uniform reference structure for evaluating sustainable learning programmes.
- To equip Vocational Education and Training educators with a clear set of instructions or a detailed guide consisting of the requirements, practices and tools for the evaluation of learning programs which are inclusive, digital, and green.

Expected outcomes

- Understanding of the requirements, practices and tools involved in the evaluation stage of sustainable learning programs
- Utilisation of the reference guide to evaluate and improve sustainable learning programmes

Activities

This section describes the steps involved in the evaluation stage of learning programmes.

1. Evaluation of the Aims of the Programme

Does it include digital technologies, ecological content, appropriateness for students with SEN and is it in accordance with the labour market requirements?

2. Criteria for Evaluating the Programme Contents

- Objectives and expected results of VET training
- Correspondence of the goals and expected results of the VET discipline with the general goals of the specialty, the qualification characteristics and the expectations of employers.
- Educational content – themes
- Digital resources
- The degree to which the curriculum contains the necessary (in terms of course objectives) and up-to-date knowledge, specific practical and professional skills. Correspondence of the educational content with the educational qualification degree.
- Quality of teaching and learning in the subject
- Diversity and effectiveness of teaching methods, incl. use of information and communication technologies. Available teaching and visualization technique and its effective use in the learning process. Student activity in the learning process. Effective support of students' research and learning. Dialogue between students and teachers.
- Resource provision of training by teachers, students and stakeholders
- Availability of criteria for distinguishing the different levels of achievement (excellent, very good, good, average).
- Test methods and criteria for evaluating knowledge and skills. Objectivity of evaluations.

3. Evaluation of Priorities

Are the following priorities implemented in the learning programme?

Priorities:

- Cost-effective school-improvement programme
- High quality digital content
- Inclusive and adapted to students with SEN
- Inclusion of themes connected to ecology
- Motivating students in content development
- Relevant to the needs of the labour market
- Created in collaboration with students and stakeholders
- Dedicated and influential educators' community

- Sustainability achieved by policy advocacy and coalition building

4. Evaluation of the Teachers' Competencies

Teachers:

- are concerned about their students.
- respect the opinion and point of view of their students.
- teach engaging lessons.
- summarize key concepts and ideas.
- manage their classroom.
- challenge their students to step outside their comfort zone to become successful citizens
- Extensively implement digital resources
- Create teaching blocks together with students and stakeholders
- Explain the practical application of the lessons, encourage each student to participate in class and create an appropriate learning environment in the classroom.
- Seek to increase the motivation of each student by developing and implementing a variety of interactive activities.
- Set high goals for students' realization at the labour market
- Develop students' social-emotional skills through good communication, building relationships and working on projects that require collaboration.
- Share lesson plans with colleagues and partners.
- Take an active part in international projects
- Organize meetings with external guests to serve as role models for students
- Organize various trainings for their colleagues.
- Are willing to seek and share advice with other colleagues and stakeholders

5. Evaluation of the Learning Process

- How the Research/Experiential Active Learning by doing is being implemented
- Raises the ambition of under-privileged youths to master a profession
- Evaluation of learning outcomes

6. Assessment of Learning Elements

- Lectures
- Digital resources
- Exercises,
- Manuals from relevant stakeholders
- Course projects and assignments, essays, etc.
- Proportionality of individual topics and their compliance with the requirements of the user (student, employer).

7. Assessment of Students' Achievements

- Assessment methods: Test, Practical tasks, Exams
- Students' motivation and readiness to develop competencies is expressed in the desire to get involved in providing educational resources together with their teachers' and stakeholders
- Participation in products production of the school dual system of teaching
- Achieved competencies for reflection
- Students are learning by discovering theoretical and practical knowledge

Types of Assessment

In the specialized pedagogical literature, depending on the type of decisions that are made on the basis of the obtained results and the stage at which the assessment is carried out, Norman Gronlund considers four types of assessment: selective, ongoing, diagnostic and final

The selective assessment is carried out before the training and the purpose is to make decisions regarding the future development of the personality. The ongoing/current assessment occurs during the training, the diagnostic one is related to establishing the extent to which specific educational goals have been achieved, and the final assessment is conducted at the end of the academic term/course and is based on the criteria approach.

Another classification - according to the method of assessment - includes the following types of assessments: analytical, holistic, formative and summative

The analytic assessment is broken down into separate independent components,

each assessed independently. The final score is summed up from the score of the individual components. Holistic assessment is global, without dividing into components. The purpose of the formative assessment is to provide feedback on the degree of assimilation of individual knowledge and skills. The summative assessment is usually conducted at the end of the course, the training. The goal is to draw a conclusion about the overall activity of the trainees.

The Functions of Assessment:

- **Diagnostic** - to establish the results of the training and eliminate identified gaps.
- **Prognostic** - for planning measures to increase the individual progress of students, to improve the quality of education or to develop the educational system.
- **Ascertaining** - to establish achieved results and certify them by issuing a document for the level reached or for continuing education.
- **Informative** - to inform the interested parties and the society about the learning results and/or about the state of the education system.
- **Motivational** - to motivate students for learning and for higher achievements.
- **Selective** - for the selection of students in classes

Assessment, Completion and Certification of Work-based Learning (Dual Learning)

Evaluating the results of practical training in a real workplace environment is ongoing/current and annual should be done by assessing the practical learning outcomes which are ongoing and final. Current assessment is conducted by the teacher/trainer in accordance with the programme requirements. The work-based learning is conducted by a mentor who together with the teacher and the students develop the practical learning programme and the work that should be completed. All teaching resources, on paper and digital are entered into a special diary. Based on the current evaluations, the mentor and the teacher determine the annual evaluation of practical training in a real work environment. The diaries of the practical training and the protocols of the annual evaluations of the practical training in a real working environment of the trainees are used for issuing the

Certificate that documents the specialty in VET. The assessment of the achieved results should be carried out after piloting and testing the methodology, in which the results of a course conducted with students using the newly developed methodology will be compared with the results of a control group that will be trained using traditional methods. The labour market realisation of the two groups of students will give us a clear picture of the successes of the learning process, where students, teachers and stakeholders jointly developed curricula that are inclusive, green and meet the requirements of the labour market.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is inclusive at this stage.

Inclusive Perspective

Requirements

At this stage, the educator has to evaluate whether or not at the end, his practice and the learning material he has chosen are inclusive.

Requirement 1: Reflection

After applying the learning tools and using the educational material the educator will have a clearer picture of the overall design of the course. The educator should reflect back on all activities, tests, assessments and personal notes they have taken throughout the course to see what has gone well and what not in terms of applying inclusive practices.

In addition, the educator could design surveys to be completed by the students who have taken the course in an attempt to see how they experienced their learning journey in regards to inclusion.

Requirement 2: External Feedback

The educator should receive external feedback in order to get a more objective opinion of their practice.

Requirement 3: Adjustments

After taking into consideration all the information and feedback, the educator should make the appropriate changes and adjustments to improve their teaching and make it as inclusive as possible.

Practices

Practice 1: Reflection

Arrange all information available (feedback, personal notes, student marks, student surveys) on a template that allows the educator to track the schedule and gain a clear image of how the learning course went, in terms of inclusion, from beginning to the end.

Practice 2: External Feedback

Send out the completed version of the methodology to other colleagues to gain feedback and new ideas on learning materials and tools used.

Practice 3: Adjustments

Use all information and feedback received to adjust the learning material so as to make them as inclusive as possible.

Tools

Tool 1: Online Tools

The educator could use online tools to keep notes of all the feedback received throughout the duration of the educational course. That will allow them to have all information gathered together at one place. An example of such an application is **Notes.io**.

The educator could use **Google Forms**, or **Microsoft Forms** to create surveys for receiving feedback from their students.

Tool 2: Online Communication Platforms

The VET educator could share their learning programme with other co-workers (or similar professionals) using online communication platforms, such as **Craft and SMEs VET NET platform**, to receive feedback on the design and methodology. An outside opinion could help the educator create a more objective image of the material and the resources they are using, and therefore

be able to make changes where appropriate to make the practice even more inclusive.

Tool 3: Document

After receiving all the feedback, the educator could use the document they had created to make the appropriate changes and/ or additions where needed.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is digital at this stage.

Digital Perspective

Requirements

The purpose of the digital perspective is to ensure the learning programme enhances the digital competencies and skills for digital transformation, both for the educator and the learner. In recent years, there has been a rapid transformation in innovation and technological evolution. Digital transformation has been a recurring theme in reshaping society, the labour market and the future of work. Due to this rapid transformation, many of the now most in-demand occupations did not even exist 10 to 5 years ago (World Economic Forum, 2016). This is supported by the European Centre for the Development of Vocational Training (Cedefop, 2018), suggesting that technological changes are a major driver of changing skill needs for future work environments, with about 85% of all EU jobs needing at least a basic digital skills level. The recent Covid-19 pandemic further accelerated this transformation, with trends of online or hybrid working/learning models emerging in the labour market and educational environment. This in turn created the need for greater levels of digital capacity in education and training; to equip learners and future workforces with the necessary knowledge, skills and competencies in line with digital change (European Commission, 2020).

The following technological trends will need to be considered by educators for 2022 and beyond. Various sources are suggesting that these technological trends are rising in popularity in transforming education and training, as well as

the future of work (Howell & O'Donnell, 2017; Newman, 2017; McGuire, 2018; Gupta, 2019; Zain, 2021; Bui, 2020 & 2022; Marr, 2022; Martin, 2022) ;

- **Virtual and Augmented Reality** - Virtual reality refers to a simulated experience within a computer-generated environment/digital classroom, where the learner can interact with others and become immersed in virtual learning via a virtual reality headset. Augmented reality helps to enhance the educator's instructions by creating an immersive/interactive experience for the learner through the integration of digital technology and the learner's environment in real-time.
- **Artificial Intelligence**
- **Gamification** - utilizing gaming technology as an instructional tool for teaching, training and learning; encouraging a more fun and engaging learning experience
- **Big Data** - this refers to the collection and analysis of complex and large data sets.
- **eLearning** - education and learning taking place through electronic/online means, utilising laptops, computers, tablets/iPads, and smartphones.
- **Personalised learning** - this considers how different students learn, prioritising the learner. The educational experience is customised/tailored specifically to cater to the learner's needs.
- **Cloud Computing**
- **Cyber security**
- **Robotics**
- **Animation** - this refers to the utilisation of moving images/cartoons for teaching and/or learning through storytelling and content which simulates real scenarios.

The following highlights the requirements for this stage in ensuring the digitalisation of educational practices.

Requirement 1: Reflection

The first requirement in ensuring the digitalisation of practices in education, is that of reflection. The VET educator should reflect on the over all learning programme design, development and implementation stages to ensure digital practices have been incorporated into the programme. This will consider everything from the learning outcomes, activities, delivery methods, resources to assessments.

Requirement 2: Feedback & Data Collection

The second requirement in ensuring the digitalisation of educational practices at this stage considers feedback and data collection in relation to the actual learning experience journey. Feedback needs to be collected from both the VET educator/trainer perspective and the learner perspective. It is important to ensure that some feedback is collected specifically in relation to the digital aspects of the programme.

Some questions to consider as part of this requirement:

VET educator/trainer perspective:

- What were the biggest challenges in the digital delivery of the programme?
- Was the educator well equipped to deal with any arising situations, or is there an area where they would benefit from additional training?
- Was the course work engaging enough?
- Did the learners successfully achieve the learning outcomes? What made this successful? What made this challenging?

Learner perspective:

- What did they like or dislike about the learning programme? How did they find the digital aspects of it?
- Were the learners able to easily access digital resources, or navigate through the learning management system (LMS)?
- Were there any aspects of the learning programme that they found particularly challenging?

- What would they change about the learning programme to make it more beneficial?

Requirement 3: Improvement

The final requirement in ensuring the digitalisation of educational practices at this stage is that of improvement. Once the VET educator has evaluated the learning programme and the learning experience journey, they should utilise the collected information to identify areas of improvement (in the digital context) which can be addressed in the design, development and implementation of the next version of the learning programme.

Practices

Practice 1: Reflection

To evaluate whether digital practices have been successfully incorporated into the learning programme, the VET educator should begin by reflecting on the elements composing said programme. This can be achieved using the SWOT analysis framework (Strengths, Weaknesses, Threats, Opportunities). The elements composing the programme refer to things such as the learning outcomes, learning activities, delivery methods, resources, assessments etc. If successful, the VET educator should see a clear indication of digital practices and use of digital resources throughout these elements.

Practice 2: Feedback & Data Collection

To evaluate whether digital practices have been successfully incorporated into the learning experience journey, the VET educator should gather primary research (field research) from the educator and learner perspectives. This can be achieved by collecting data using a mixed method of qualitative and quantitative methods. For example, an interview can be conducted with the teacher (s)/trainer (s) involved in the design, development and implementation of the learning programme to gather quality insights into the learning experience journey from the educators perspective. Surveys or questionnaires can be given to the learners to gather valuable insights / quantitative insights about their learning experience journey.

Practice 3: Improvement

To ensure the digitalisation of educational practices in the learning programme, the VET educator should utilise the information which was collected on the learning programme contents/elements and the learner journey to identify areas of improvement. An overview containing this information will help the educator to identify any weaknesses in the learning programme, and what could be done to further enhance the digitalisation of educational practices.

Tools

Tool 1: SWOT Analysis Framework

The VET educator can use a SWOT analysis framework to evaluate the learning programme contents/elements against their strengths, weaknesses, opportunities and threats in relation to the digitalisation of the programme. This can then be compiled into an overall report (along with the other inclusive, green and supportive ecosystem perspectives SWOT) for a full overview.

Tool 2: Interviews & Surveys

To evaluate whether digital practices have been successfully incorporated into the learning experience journey, a mixed method data collection approach can be taken using interviews and surveys.

Tool 3: Report

The VET educator can compile a report containing the full information of the SWOT analysis and the information resulting from feedback/data collection. A report can be a valuable tool for providing an overview of the details of the learning programme, and help with any future decision making.

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program is green at this stage.

Green Perspective

Requirements

To have clear idea of how to evaluate the learning programme, emphasis needs to be placed on the criteria which show how the programme is supporting climate neutrality.

This means having defined criteria in line with the Paris Agreement, which calls for achieving “a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHG) in the second half of this century”. The EU recently specified climate neutrality as a 2050 target in its Climate Law (Regulation (EU) 2021/1119). In Article 2, the EU states that the climate neutrality objective means to balance EU domestic GHG emissions and removals reducing emissions to net zero. After reaching climate neutrality, the EU aims to achieve net negative emissions. In a regional or local context, climate neutrality means to balance GHG emissions and emission removals within the specified community or region. The term climate neutrality thus describes a state in which net GHG emissions arising from a given territory have reached zero (“net zero”). This means that the remaining GHG emissions are in the same order of magnitude as natural sinks such as soils, forests or wetlands and technical GHG removal taking place through capture and storage of emissions in chemicals and underground storage sites. Climate neutrality or GHG neutrality is to be differentiated from carbon or CO₂ neutrality, the difference being that climate neutrality covers all GHGs that are driving the global temperature rise. The concept builds on the evidence brought forward by the Intergovernmental Panel on Climate Change (IPCC) in its report on the 1.5°C limit which specifies that to hold this limit, global CO₂ emissions have to reach net zero by 2050 and global GHG emissions have to reach net zero by around 2070 – a finding that has been confirmed by the IPCC’s more recent AR6 report.

Purpose of Indicators	Indicators
Formulation of objectives	GHG emissions from transport Energy consumption of transport
Enabler 1: Zero-carbon fuel	Share of low-emission fuels Average GHG emission of new vehicles Number of vehicles Electric charging points
Enabler 2: Incentivising modal shift	Modal split of passenger and freight transport Expenditure per capita on transport
Enabler 3: Urban and territorial planning	Passenger transport volume Freight transport volume Infrastructure updates and additions by mode of transport Commuting travel time Congestions and delays
Enabler 4: Digitalisation	Commuting travel time Congestions and delays

On the educational level, the VET educator needs to review the learning programme to ensure that it equips learners with the following competencies:

Valuing sustainability enables learners to reflect on their way of thinking, their plans, and their actions. It makes them think about whether their actions cause any harm to the environment and are in line with sustainability values. This offers learners an opportunity to discuss and reflect on values, their variety and culture-dependence.

Supporting fairness is about promoting equity and justice among present and future generations, while learning from past traditions and actions. Starting from the premise that human health is intrinsically linked to planetary health, this competence can help learners understand that environmental quality is linked to equity and justice. Access to green spaces can reduce health-related socio-economic inequalities. Environmental equity and justice imply, therefore, human equity and justice.

Promoting nature is about developing empathy towards the planet and showing care for other species. This requires knowledge about the main parts of the natural environment (geosphere, biosphere, hydrosphere, cryosphere and atmosphere) and the close links and interdependence between living organisms and non-living components. Knowledge about natural phenomena can spur

people on to connect more with nature, which in turn can motivate further learning of sustainability. Promoting nature fosters a healthy relationship with the natural environment and aims to ignite in people a feeling of connectedness that can help contrast the psychological distress and negative emotions that children and young people worldwide experience because of climate change, as well as helping improve their mood and mental health.

Futures literacy empowers learners to create their visions for a sustainable future by providing them with the knowledge, skills and attitudes to understand the future as a variety of alternatives. Research commonly differentiates between three approaches in order to understand the future:

- Expected future, i.e. what is expected to happen based on what it is happening today and what is known, e.g. business as usual;
- Alternative future(s), i.e. what will happen may differ from expectations, e.g. creation of green jobs that currently do not exist;
- Preferred future, i.e. a sustainable future may be envisioned for people, communities and the planet. This may include the identification of the steps and actions needed to achieve that future, e.g. a circular economy.

Through futures literacy, learners can anticipate, prepare and invent as changes occur. Futures literacy encourages learners to i) use their imagination when thinking about the future, ii) tap into their intuitions and creativity, and iii) assess the possible steps needed to achieve their preferred future. By using real-life experiences, learners can be taught in futures methodologies that adopt qualitative and/or quantitative research methods.

Adaptability is about being flexible and able to adapt to new situations and adjusting to accommodating changes in the complex world. It is essential that learners are able to cope with uncertainty about the future and the ambiguity of wicked sustainability problems and how they may evolve. Adaptability should provide learners with the ability to cope with trade-offs in sustainability e.g. environmental impacts and social outcomes as well as economic aspects. Moreover, learners should feel empowered to consider options and make decisions even when facing contradictions and risks in terms of the future.

Exploratory thinking aims to foster creativity in order to envision alternative futures. By tapping into different disciplines, traditions and cultures in a transdisciplinary manner, exploratory thinking can help learners create future visions for a circular economy (SDG 12) and society (SDG 11). To move away from linear production and consumption patterns to circular ones, a combination of creative thinking and experimentation with new ideas and new approaches is needed.

Acting for sustainability encourages learners to take action at individual and collective levels to shape sustainable futures, to the extent possible. It also invites learners to demand action from those responsible to make change happen. Acting for sustainability should, however, include as its enabling counterpart, the willingness of the decision-makers to share their capacity to make decisions, so that the activities of learners can have an actual impact.

Practices

Examples of knowledge (K), skills (S) and attitudes(A) for Valuing sustainability

K: knows the main views on sustainability: anthropocentrism (human-centric), technocentrism (technological solutions to ecological problems) and ecocentrism (nature-centred), and how they influence assumptions and arguments;

S: can articulate and negotiate sustainability values, principles and objectives while recognising different viewpoints;

A: is prone to acting in line with values and principles for sustainability. For example: Given the apparent tensions between sustainability and consumerism based on the use of natural resources, everybody should be able to contemplate what impact buying fast fashion or taking a flight for a weekend getaway would have at system level (SDG 12).

Examples of knowledge (K), skills (S) and attitudes(A) for Supporting fairness

K: knows that ethical concepts and justice for current and future generations are related to protecting nature;

S: can apply equity and justice for current and future generations as criteria for environmental preservation and the use of natural resources;

A: is committed to respecting the interests of future generations. For example: The 'Stop Ecocide Foundation' initiative has been drafting a law on offences against the environment, or ecocide, which is defined as 'unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and widespread or long-term damage to the environment being caused by those acts' (SDGs 14,15, 16). Examples of ecocide include deforestation of the Amazon or the killing of protected species.

Examples of knowledge (K), skills (S) and attitudes(A) for Promoting nature

K: knows that our wellbeing, health and security depend on the wellbeing of nature;

S: can assess own impact on nature and consider the protection of nature an essential task for every individual;

A: cares about a harmonious relationship existing between nature and humans. For example: The Nature Conservancy – a global environmental non-profit organisation – believes that helping young people build relationships with nature (SDG 4) is critical to ensure a more sustainable future (SDGs 15, 3, 11). The Nature Lab, the Nature Conservancy's youth curriculum platform, provides educational resources for different age groups to teach them how nature works and how young people can contribute to its conservation.

Examples of knowledge (K), skills (S) and attitudes(A) for Futures literacy

K: knows the difference between expected, preferred and alternative futures for sustainability scenarios;

S: can envisage alternative futures for sustainability that are grounded in science, creativity and values for sustainability;

A: is aware that the projected consequences on self and community may influence preferences for certain scenarios above others. For example: Prompting 'futures literacy' as a life skill for students and educators (SDG 4) is the mission of the global non-profit organisation **Teach the Future**. Thanks to

their resources for lifelong learning, learners can imagine more sustainable futures, where, for example, communities have access to clean water, clean energy and healthy food (multiple SDGs including 6, 7, 2).

Examples of knowledge (K), skills (S) and attitudes(A) for Adaptability

K: knows that human actions may have unpredictable, uncertain and complex consequences for the environment;

S: can take into account local circumstances when dealing with sustainability issues and opportunities;

A: is willing to discontinue unsustainable practices and try alternative solutions. For example: Young people play a central role in driving the adaptation agenda. On 22 January 2021, young people from over 115 countries launched 'Adapt for our Future' a global youth call to action on adaptation. This initiative aims to prepare younger generations for the transition towards green and climate resilient development.

Examples of knowledge (K), skills (S) and attitudes(A) for exploratory thinking

K: knows that sustainability problems must be tackled by combining different disciplines, knowledge cultures and divergent views to initiate systemic change;

S: can synthesise sustainability-related information and data from different disciplines;

A: is committed to considering sustainability challenges and opportunities from different angles. For example: 'Reduce, reuse, recycle' is a well-known concept for the circular economy, and an exploratory thinking approach can help turn waste into a precious resource. The Eco-Schools programme has developed a number of trash hack ideas that can help explore the issue of waste from different perspectives.

Examples of knowledge (K), skills (S) and attitudes(A) for Individual initiative

K: knows that preventive action should be taken when certain actions or inaction may damage human health and all life forms (precautionary principle);

S: can act promptly, even in the face of uncertainty and unforeseen events, keeping in mind the precautionary principle;

A: is confident about anticipating and influencing sustainable changes. For example: Courses, such as 'Knowledge to Action' as part of the International Master's programme in Environmental and Sustainability at Lund University, offer learners a hands-on opportunity to interact in real-world settings with those at societal level such as municipalities, organisations, companies and third sector organisations while taking part in a project that promotes sustainability (SDGs 16, 13).

Examples of knowledge (K), skills (S) and attitudes(A) for collective action:

K: knows how to work with diverse participants to create inclusive visions for a more sustainable future;

S: can create transparent, inclusive and community-driven processes;

A: is willing to engage with others to challenge the status quo. For example: Collective action in the digital age has increased and is enabled through technology, e.g. the European Education for Climate Coalition, a digital platform that enables members of a community of practice to decide collectively, act collaboratively, and co-create solutions for sustainability (SDG 13).

Tools

The following sources can be used as a means for evaluating the learning programme in comparing the learning objectives against these criteria.

- **For Supporting fairness:**
<https://www.stopecocide.earth/legal-definition>
- **For Promoting nature:**
<https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/>
- **For Adaptability:**
<https://klimaadaptatiegroningen.nl/en/action>

- **For exploratory thinking:**
<https://www.ecoschools.global/trash-hack-ideas>

- **For Individual initiative**
<https://www.lumes.lu.se/article/2019-knowledge-action-projects>

- **For Collective action**
<https://education-for-climate.ec.europa.eu/community/home>

The following section will now highlight the requirements, practices and tools needed to ensure that the learning program supports ecosystems at this stage.

Supportive Ecosystems Perspective

Requirements

The COVID-19 crisis has increased the urgency of guaranteeing quality education in Vocational Education and Training (VET) that promotes the training of employees, improves the employability of recent graduates, and promotes training programmes for the most vulnerable groups.

Therefore, education and training needs to be tailored to the demands of the current environment, which implies the continuous updating of the professional modules of the learning programmes, adapting them to the demands of the productive system with the perspective of the requirements of sustainable development.

The above is aligned with Sustainable Development Goal number four (SDG 4) of the United Nations 2030 Agenda, a priority for public administrations and supporting ecosystems which aims to achieve universal access to quality education throughout life and promote technical training, eliminating economic and gender barriers that are a source of inequalities.

Developing initiatives based on the union of forces and efforts that contribute to achieving this goal is key to overcoming poverty, favouring the reduction of

inequality, improving social and environmental awareness and being a driving force for the economy and innovation.

Improving collaboration between higher education and Vocational Education and Training institutions or collaboration between the educational administration, social and economic agents in order to favour entrepreneurial initiatives and innovation, are essential in order to achieve this objective. These structural alliances or partnerships will enable faster progress in the process of change towards sustainable development, as well as favouring good practices in their immediate local and regional environments.

In other words, companies and social agents must be involved in the development of VET programmes, with the aim of reinforcing strategies for change towards a new development model and the incorporation into training of factors that contribute to social cohesion and development. Thus, agreements can be reached to promote a culture of responsibility and the commitment of supporting ecosystems to education and sustainable development.

Practices

Preliminary questions:

- **Eligibility criteria:** *Does the stakeholder influence the teaching process?*
- **Relevance criteria:** *Can the stakeholder change the learning process?*
- **Impact criteria:** *Will the stakeholder contribute to the long-term success of the VET institution?*

The **participation** of social agents, the different administrations and other actors in the identification and updating of qualification needs, as well as the training required, ensures the value of qualifications in the labour market.

Public-private **collaboration** and, in particular, the participation of companies in the definition of skills profiles and the establishment of learning programmes is essential to ensure that Vocational Education and Training is of quality and meets the demands of the labour market.

The success of an effective VET System requires a close alliance, **cooperation** and **trust** between three actors: *i) administrations, ii) training centres and teachers, iii) companies and families*. These actors are the ones who give solidity and efficiency to the Vocational Education and Training System.

This **alliance** between these three actors is particularly important because of the dual nature of VET. The effective commitment of enterprises and the role of educators are particularly important for its success. However, its social and entrepreneurial success depends on its extension to all the small and medium-sized enterprises that make up the business sector.

Tools

For enhancing the role of supporting ecosystems and coordination between key actors (*social agents, institutions and entities, especially local corporations, professional associations, non-governmental organisations, and other business and trade union entities*), long-term strategic alliances can be generated in the VET system.

The following initiatives are proposed:

- **Signing of an agreement** between the collaborating entity, the educational administration and the labour administration for the organisation and development of the learning programmes.
- Regular **discussion chairs, research projects and observatories**;
- Collaborating with **sectoral or thematic forums and associations**;
- **Focus groups** to validate the content of the learning programmes proposed in order to get a more detailed insight into the content.

Supportive ecosystems, and especially companies are aware that the development of their activity has an impact on their stakeholders and on the environment in which they operate. Within this framework, they are increasingly reaffirming their commitment to support and contribute positively to the development of society.

Education is a completely cross-cutting area of action that affects all companies and countries. Companies -*as any other relevant actor in the education field*- can support training and job orientation programmes accessible to the most vulnerable groups, aimed at:

- minimising school failure and reintegration into the labour market;
- encourage corporate volunteering aimed at bridging the gap between education and the labour market;
- promote initiatives to improve access to education in the least developed areas where companies operate.

All these actions can become an intangible asset of strategic value for supporting ecosystems, as well as an opportunity to influence the VET system through collaboration in the development of Sustainable Learning Programmes that are inclusive, green and digital.

The following section will now conclude this publication.

4. CONCLUSION

To conclude, in line with the rapid changes toward a green transition and digital transformation, flexible responses are required from the Vocational Education and Training sector with appropriate methodologies to foster resilience and responsiveness to changing societal and labour market needs. The Vocational Education and Training sector has an important role in facilitating these changes by providing people with the necessary skill, competencies and knowledge for work in everchanging environments, to cope with emergency situations and economic shocks, while also supporting economic growth and social cohesion. The methodological framework within this publication aims to support VET teachers and trainers in doing so by providing them with a set of resources and guidelines to develop **learning programs that are inclusive, digital, green, and more responsive to societal and labour market needs**. This methodology supports the reform of vocational education and training providers toward more inclusive practices, empowering them to innovate their pedagogical approaches and learning materials to meet the learning needs of diverse VET learner groups, as well as enhance skills for digital transformation for both VET providers and learners, and support the integration of environmental-friendly means of teaching and training. It also supports the development of VET systems that are proactive and flexible in supporting broader innovations for social and environmental sustainability objectives and support the involvement of all the stakeholders who have an interest in quality and innovation in VET in shaping VET Provision, in order to anticipate skill needs of fast-changing labour market scenarios.

The formation of the methodological framework for sustainable learning programmes has been supported with evidence gathered consisting of supporting data from Vocational Education and Training teachers and trainers throughout the 18th and 19th of May Virtual Knowledge Fair, secondary research of the preliminary analysis activity in the formation of the online survey, and survey responses. As previously mentioned, the proposed methodological framework for sustainable learning programmes amalgamates the ADDIE model, Kern's 1998 framework and use of three phases (suggested by Han Ahn *et al.*, 2009). It consists of a preliminary phase which incorporates the analysis stage; the development phase which includes the design, development (and improvement) and implementation stages;

and the evaluation phase which includes the evaluation stage. The methodology has been further structured into four main layers within each stage consisting of the requirements, practices and tools for the development of learning programmes which are inclusive, digital, green and support ecosystems. Vocational Education and Training teachers, trainers, mentors and/or coaches should utilise this reference structure in ensuring the theme of sustainability in the creation of new or development/enhancement of existing learning programmes in line with sustainable change. Although the methodological framework is addressed to teachers and trainers of both Initial and Continued Vocation Education and Training, it has been designed to be applicable to any curriculum and transferable to any other public or private Education and Training provider.

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