

## Result no 1

Digitalisation for sustainable development of SMEs  
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# The methodology and curriculum for the sustainable Digital Transformation Training Scheme for SMEs



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## 1. General information

<b>GENERAL CHARACTERISTICS OF THE STUDIES CONDUCTED</b>	
1) name of the field of study: <b>Sustainable Digital Transformation</b>	
2) level of education: <b>vocational studies, postgraduate</b>	
3) education profile: <b>VET</b>	
4) form of studies (full-time / part-time): <b>part time</b>	
5) professional title awarded to the graduate: <b>Specialist of sustainable digital transformation</b>	
<p>The curriculum is designed for employees of companies of different sectors, owners of companies and their managerial staff interested in sustainable digital transformation. It has been designed as a course within the vocational studies or postgraduate program; the specialised knowledge can be given in various field of study, first in economics and management, but also in natural science, engineering and technology, up through the humanities. The knowledge described by this curriculum is required to acquire knowledge that will allow the graduate to use the achievements of sustainable digital technologies to become more aware leader and specialist in their field. The graduate should be aware of two main global processes: green and digital revolution and know how to combine requirements of those two processes and meet their challenges in business reality. Finally, how to implement different solutions in the framework of sustainable digital transformation of the company.</p>	
6) the total number of hours of lectures and classes: <b>375</b>	
7) number of ECTS points necessary to complete studies at a given level: <b>15</b>	
8) number of semesters: <b>1</b>	
9) an indication of the discipline or disciplines (with an indication of the main discipline) to which the learning outcomes relate, and for each of these disciplines, the percentage of the number of ECTS points in the number of ECTS points necessary to complete studies at a given level:	
<ul style="list-style-type: none"> <li>• management and quality studies: 50% leading discipline</li> <li>• economics and finance: 25%</li> <li>• computer and information sciences: 25%</li> </ul>	
10) Modules:	
<b>Module 1: Innovation-enabling policy &amp; regulation</b>	
Unit 1.1. Sustainable management approach and strategies	
Unit 1.2. The role EU policy and regulations in SME development processes	
Unit 1.3. Sustainable digital marketing strategies	

**Module 2: The model of Circular Economy**

- Unit 2.1. Circular economy
- Unit 2.2. Environmental waste disposal
- Unit 2.3. Technologies for circular economy

**Module 3: Socially responsible digital transformation**

- Unit 3.1. Digital transformation
- Unit 3.2. Digital workforces
- Unit 3.3. Social aspect of sustainability

**Module 4: Green(er) Technologies**

- Unit 4.1. Sustainable digitalisation
- Unit 4.2. Adopting eco-friendly power sources
- Unit 4.3. Sustainable business ecosystems

- 11) Description of the field of study, in particular the goals of education and employment opportunities (typical jobs) and continuation of education by graduates

Sustainable digital transformation is a concept that refers to the process of digitalising the economy in a long-lasting, green, and organic way. Sustainable digitalisation aims to support and enable Europe's twin transitions to a green and digital economy by building on its key strength: innovative SMEs and their business ecosystems. The concept seems to be very easy in the theory, but complex in practice. It is based on four pillars:

- Innovation-enabling policy & regulation – a legal framework to enhance investments in green, digital technologies,
- Circular economy – system solutions framework that tackles all global challenges referring to environmental issues and implementing them into business strategy,
- Sustainable digitalisation, focusing on long-term strategy towards shifting to fully digital solutions, environmentally neutral, including social aspects,
- Green technologies – technologies and business operations protecting the environment.

Business needs specialist who on the one hand are professional in digital technologies, on the other hand are aware of the climate change and know how to combine digital transformation with environmental issues.

**PROFESSIONAL CAREER DEVELOPMENT**

This field of study primarily allows trainee to expand or deepen his/hers economic and business knowledge.

The program develops the skills necessary to start a career as:

- highly qualified specialists, dealing with digital transformation in various types of organizations (various enterprises, non-profit organizations, public administration units, local, regional, or national government),
- managerial staff of operational, administrative, and engineering departments in international corporations or small and medium-sized enterprises (SMEs) operating on a national and international scale,
- entrepreneurs running their own companies on the domestic and international market.

12) the manner of considering the results of the analysis of compliance of the assumed learning outcomes with the needs of the labour market

The needs of the labour market were considered thanks to the implementation of focus groups, which consisted of over 60 people of various origins. Those needs were also confirmed thanks to the desk research of the Consortium Partners. Business orientation has been checked also by business Partners of the Consortium.

## 2. Methodological framework

Curriculum, as we comprehend it today, has developed through the years, from precarious and muddled to a range of systematically planned and unplanned relevant learning experiences that occur in the educational process. Beginning in the 1980s, Harden et al. (1984) proposed a model for educational strategies in curriculum planning with the mnemonic SPICES, used mostly in medical schools but possibly applicable also at other universities. It covered the following elements:

**S**- Student-centred – the student/trainee is responsible for their own education. It means that he/she has to set their own learning objectives, decide about the pace of learning and evaluate their own education according to their own criteria. The emphasis is put not on what the teacher/trainer teaches, but what the trainee learns.

**P** – Problem-based – the main purpose of this is to use the method as a vehicle to develop a usable body of integrated knowledge and to develop problem-solving skills.

**I** – Integrated teaching – in this approach, the university organizes a teaching structure to interrelate or unify subjects usually taught in separate academic course or department. This curriculum has been created as a perfect example of an integrated teaching method.

**C** – Community-oriented – a teaching process must be community-based; this means that it must be consistent with the expectations of the local community and its strategy.

**S** -Systemic approach – the education process must be treated as a system of joined and interrelated elements, so all courses are set to the same goals and learning outcomes.

In 1998, David Kern (2009; 2015; 2016) proposed another teaching model, based on 6 steps (the methodology of this curriculum has been based on this approach):

- 1) Problem identification and general needs assessments – this is a basic step, where educators must find out what the purpose is of developing a new curriculum: a new kind of knowledge, or perhaps tools which need to be reconsidered,
- 2) Targeted need assessment – the first step has to be operationalised in terms of the needs of the targeted learners,
- 3) Goals and objectives – the fundamental part of the curriculum, where goals are defined as a broad concept to be achieved and objectives are the targeted results of the curriculum development,
- 4) Educational strategies – defines how the outcomes should be achieved,
- 5) Implementation – a strategic plan for how to achieve the desired outcomes,
- 6) Evaluation and feedback – ways educators can discover whether the curriculum has been developed properly and whether it needs refinement.

Another model – PRISM, proposed by Bligh (2001) - can be broken into the following components:

**P** – Product-focused – a more practical approach focused on the application of methods rather than theoretical knowledge,

**R** – Relevance – this is like the community-based approach (from Harden, 1984): the curriculum should address problems raised by the community and local stakeholders,

**I** – Interprofessional – trainees must work in teams to jointly solve problems,

**S** – Smaller – classes should be small, and lectures should cover smaller units, as concentration is higher when a unit does not last as long,

**M** – Multisite – further emphasizing the product-focused goal of the curricula while at the same time achieving social aims,

**S** – Symbiotic – the outcome has to be consistent and interrelated.

Those systems must be adjusted to the specificity of the VET education. Vocational Education and Training (VET) ensures skills development in a wide range of occupational fields, through school-based and work-based learning. The best outcome is from combining those two approaches. The main challenges that related to VET teacher training are mainly (CEDEFOP, 2016):

- the diverse systems in which they work,
- their different training needs,
- the need for closer cooperation between businesses and VET schools,
- the recognition of VET teachers', trainers' and mentors' potential,
- the need for planning and monitoring their development, the importance of school leadership that promotes a more professional environment for learning, the need to use EU funding with sustainable plans for long-term teacher training.

In the last few decades, special emphasis has been put on social competence, which is necessary for building interpersonal relations and teamwork. The competence required from university graduates, being then employees at different companies and sectors, also includes cognitive skills, which are of a universal character, independent from the syllabus and content of academic of VET classes. The 2018 Council recommendation on key competences for lifelong learning (EU, 2018) defines eight key competences that all learners – including VET learners – should acquire:

- literacy,
- multilingual,
- mathematical, science, technology, and engineering,
- digital,
- personal, social, and learning to learn,
- citizenship,
- entrepreneurship.



Nowadays, competence requirements have changed with more jobs being subject to automation, technologies playing a bigger role in all areas of work and life, and entrepreneurial, social and civic competences becoming more relevant in order to ensure resilience and ability to adapt to change. It refers to both, academic and vocational education. Skills development is a key component of a fast transition towards an environmentally sustainable and digital economy. It can enhance and facilitate a smooth reallocation of labour and minimize any negative impact on labour market. It will also accelerate the transition to a green economy through the promotion of green jobs that in themselves may help to catalyse a just transition (ILO 2018). To help their employees keep up with newly implemented greening processes and technologies, enterprises can offer them training. Developing the green capacities of workers can help to prevent unnecessary redundancies.

Another issue is what educational strategies to adopt to transfer these skills to trainees. In today's academic teaching, we observe the paradigmatic change consisting of the shift from teaching to supporting learning. It is proposed that "passing on knowledge should be replaced by teaching cognitive and existential self-reliance" and that the educational culture of imposing should give way to the culture of offering. A modern education favours an orientation with the trainee placed in the centre of the educational process, called "the facilitation of learning", which is replacing teacher-and-content-centred education, based on "passing knowledge." The directive is that the expository teaching process should be replaced by a process with trainees and their multilateral activity at its centre. Thus, they propose a shift from theory and educational concepts based on the behavioural paradigm to the constructivist, humanistic, or even critical-emancipation paradigms. In each of them, teaching and learning are understood and defined in a different way, different roles are attributed to trainees and teachers/trainers, and different strategies and teaching forms are used. Hence, depending on the adopted paradigm, teachers use different models of designing and teaching classes in their academic and vocational practice. This is particularly in the VET, where practical knowledge has special importance. Among a number of cognitive and social learning theories widely spread in recent years, it is constructivism which seems to be the best known. Constructivists believe that learning consists of the learner's giving meaning to the process of the construction of individual cognitive structures, which takes place thanks to his or her involvement and multilateral activity. In accordance with the assumptions of constructivism, learning occurs when (Pritchard, 2009: 32–33):

- the construction of knowledge, rather than the reproduction of knowledge, is paramount,
- new information is built into and added onto an individual's current structure of knowledge, understanding and skills,
- trainees construct their own knowledge in an active way (active learning strategies),

- trainees use their previous knowledge in building new knowledge,
- training involves the use of a variety of resources,
- authentic tasks in a meaningful context are encouraged,
- reflection on prior knowledge is encouraged,
- collaborative work is encouraged,
- autonomy is encouraged.

Constructivism as a theory of learning and cognition explains how people learn, while at the same time becoming the framework for designing a teaching process, as it emphasises what trainees need to do to construct their knowledge. As a result, this indicates what learning activities teachers should plan for them to achieve the assumed teaching goals and effects (Biggs, Tang, 2007: 21).

Another issue which has to be considered is edutainment. New generations bring to the classroom a new hierarchy of values and their own style of work, beliefs, as well as new needs and opportunities. Digital technology has a powerful impact on how the brain is being shaped and how it is functioning. Under the influence of electronic media and new forms of virtual socialization, new types of brain activity and new skills are emerging. Trainees are not as willing to read paper books as much as before. They expect a change in the form of communication and adaptation of educational content to their perception. The answer may be edutainment, which is a form of learning that comes from merging education and entertainment. It is a form of entertainment designed to educate and train, but also to amuse. The main purpose of edutainment is to promote trainee learning through exploration, interactivity, community experience, teamwork, trial and error, and repetition in such a way that trainees get so lost in the fun that they do not realize they are learning at the same time (Pietrzykowski, 2019).

The process of developing the curriculum has to take into account modern approaches and try to follow trends shaping the education market today and responding to the challenges of contemporary world.

## 2.1. Problem identification and general needs assessment

Two main processes that are globally influence current economy and labour market, are: digitalisation and environmental shift towards green and sustainable economy, including circular economy. Digitalisation is taking place at a fast pace in all European countries and across almost the whole world. The Covid-19 pandemic is also accelerating digitalisation at many levels. Digitalisation is transforming the economies, societies, forms of communication, jobs and the necessary skills for the workplace and everyday life. Digitalisation as a systemic enabling process that has enormous potential to boost the circular economy and contribute to the sustainable transition. On the other hand, as one of the drivers of growth of production and consumption globally, digitalisation is also a challenge for environmental and social sustainability. The scope and speed of the digital transformation varies across European countries, sectors, organisations, and places. For example, less than a fifth of companies in the EU are highly digitised, leaning toward much greater levels of uptake in large enterprises as opposed to SMEs (2020, EIO Biennial report).

Despite progress in waste management and recycling across the EU, circularity rates remain relatively low. Digitalisation can help to minimise waste, enable more efficient processes in companies, promote longer product life cycles and reduce transaction costs through significantly improved information. There is an enormous spectrum of possible applications to scale-up and mainstream eco-innovations toward a sustainable circular economy. The commercial benefits of greening stem from the potential to increase market share and capture new markets from eco-innovation, eco-entrepreneurship, and eco-adoption among SMEs. The rationale here is that “green” products, niches, and practices represent previously untapped business opportunities that SMEs are uniquely suited to tackle, especially because of their small size and flexibility. Broadly, sustainable SMEs contribute to the protection of the climate, environment, and biodiversity through their products, services, and business practices. But they do so in different way; some SMEs focus on reducing the environmental footprint of their production process (e.g. resource-efficient processes) while others focus on green outputs and offer green products and services (e.g. renewable energy products). Although there are many SMEs that really care for the environment, that largest portion of them perceives eco-innovations as a burden and pursuit eco innovations only when pushed by the legislator. There is a need to prepare the training scheme for SMEs representatives (employees dealing with digital technologies, managers running business operation, business educators dealing with business education) to enlarge the awareness about possibilities of using digital technologies for green purposes, as well as to show how much SMEs can benefit from implementing sustainable digital technologies. The cost reductions for SMEs generally arise from efficiency

gains since less inputs are required to produce the same output. These cost reductions are realized through the following channels. These channels are applicable to SMEs in both developing and developed contexts (OECD, 2018).

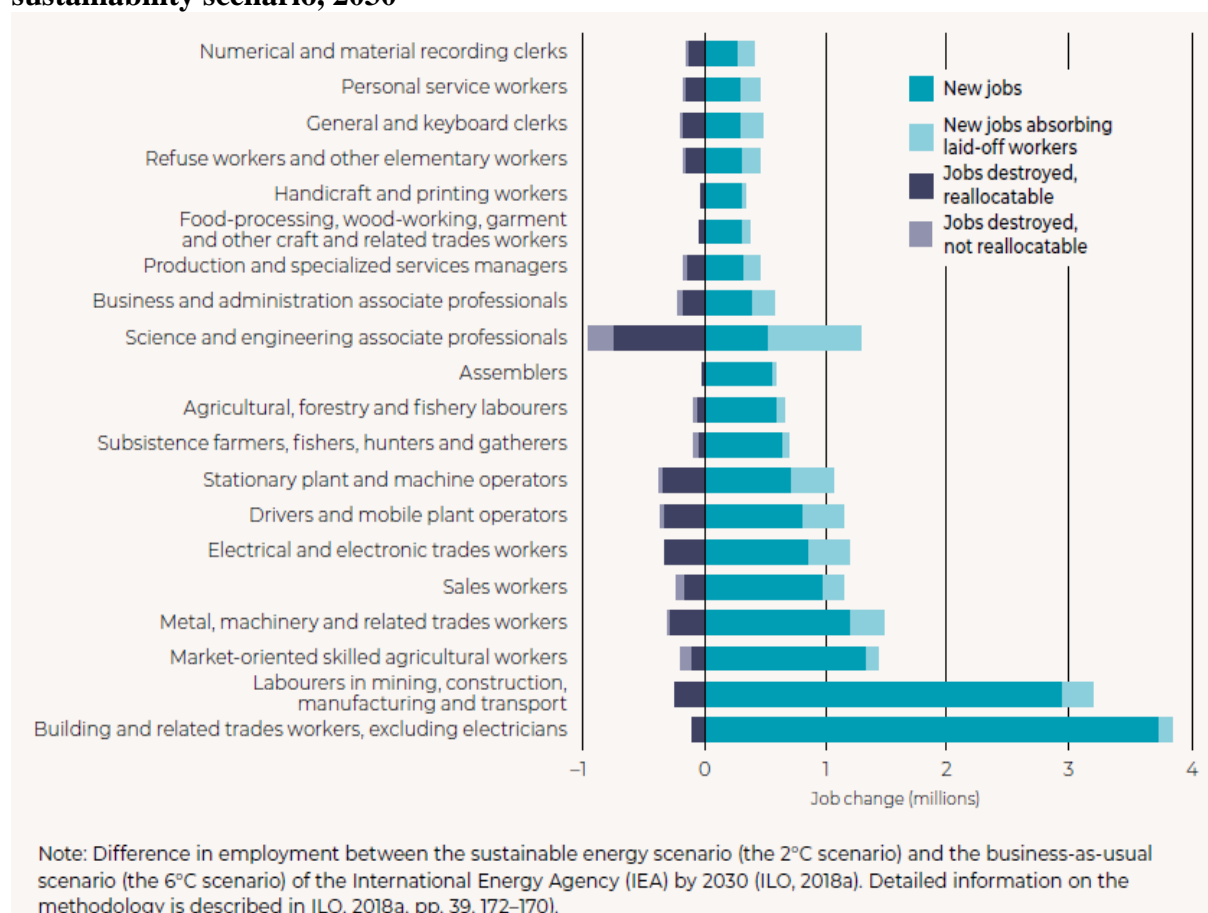
- Process efficiency: By optimizing current processes or introducing new more efficient ones, SMEs minimize the required inputs and waste production,
- Product design: SMEs can re-design their products to reduce the required inputs without sacrificing the product's utility,
- Waste disposal: In addition to reducing waste by improving process efficiency, SMEs can reuse already-generate waste or pass it along to other companies. This reduces cost of waste disposal,
- Source of raw material: SMEs can reduce cost of raw materials by switching to recycled materials,
- Infrastructure efficiency: SMEs can generate savings associated with energy efficiency lighting, building insulation, and heating systems efficiency,
- Packaging and transport: By reducing the volume of packaging and switching to local suppliers to decreasing shipping distances, SMEs can further reduce costs.

## 2.2. Needs assessment of targeted learners

We certainly live in time of transition. The twin green and digital transitions are reshaping the way we live, play, work and interact. The EU's move to a resource-efficient, circular, digitised and climate neutral economy and the wide deployment of artificial intelligence and robotics are expected to create new jobs while other occupations will change or even disappear. The COVID-19 pandemic has accelerated the digital transition. While telework and distance learning have become a reality for millions of people in the EU, the limitations of our current digital preparedness were often also revealed and showed the different Countries are not prepared for the new reality, as well as many companies, especially from the SME sectors. The pandemic has accentuated the digital skills gap that already existed and new inequalities are emerging as many people do not have the required level of digital skills or are in workplaces or schools lagging behind in digitalisation (EU, 2020). According to ILO estimations (ILO 2018) of the impact that the transition to energy sustainability by 2030 will have on labour market, almost 25 million jobs will be created and nearly 7 million lost globally. 5 million out of those 7 million can be reclaimed through labour reallocation – that is, 5 million workers who lose their jobs because of contraction in specific industries will have to search and finally find jobs in the same occupation in another industry within the same country. This means that between 1 and 2 million workers are likely to be in occupations where jobs will be lost without equivalent vacancies arising in other industries and will require reskilling into other occupations. It also

means that massive investment will be needed to train workers in the skills required for close to 20 million new jobs (see figure 2.1).

**Figure 2.1. Occupations most in demand across industries in a global energy sustainability scenario, 2030**



Source: ILO estimations based on EXIOBASE v3 national labour force surveys

As the ILO reports (2018), most job creation and reallocation are concentrated among mid-skill occupations. The greatest impact will therefore be on male-dominated occupations. The most widespread effect of the green transition on employment is the need to reskill or upskill within existing job places. New and emerging green occupations are rarer and are likely to happen at higher skill levels. Low-skilled occupations tend to require limited adaptation to greener work processes such as simply greater environmental awareness (see table 2.1.).

**Table 2.1. Changes in skills required, by skill level of occupation**

SKILL LEVEL	NATURE OF CHANGE	TYPICAL SKILLS RESPONSE	EXAMPLE OCCUPATIONS
<b>Low-skilled occupations</b>	Occupations change in a generic way, e.g. requiring increased environmental awareness or simple adaptations to work procedures	On-the-job learning or short reskilling and upskilling programmes	Refuse/waste collectors, dumpers
<b>Medium-skilled occupations</b>	Some new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	Short to longer upskilling and reskilling programmes; TVET courses	<i>New occupations:</i> wind turbine operators; solar panel installers <i>Changing occupations:</i> roofers; technicians in heating, ventilation and air conditioning; plumbers
<b>High-skilled occupations</b>	Locus of most new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	University degree; longer upskilling programmes	<i>New occupations:</i> agricultural meteorologists, climate change scientists; energy auditors, energy consultants; carbon trading analysts <i>Changing occupations:</i> building facilities managers; architects; engineers

Source: ILO 2018, *Skills for green jobs, Country reports*.

In the process of transition towards the green, sustainable economy, both technical (specific to reach occupation) and core (soft) skills will be required (see table 2.2.). Less developed countries will face special deficits and challenges especially due to the shortages of university graduates in science, technology, engineering, and mathematics skills.

**Table 2.2. Main core skills required for green jobs, by skill level of occupation**

REQUIRED ACROSS THE LABOUR FORCE	REQUIRED IN MEDIUM-TO HIGH-SKILLED OCCUPATIONS
<ul style="list-style-type: none"> <li>• Environmental awareness and protection; willingness and capability to learn about sustainable development</li> <li>• Adaptability and transferability skills to enable workers to learn and apply the new technologies and processes required to green their jobs</li> <li>• Teamwork skills reflecting the need for organizations to work collectively on tackling their environmental footprint</li> <li>• Resilience to see through the changes required</li> <li>• Communication and negotiation skills to promote required change to colleagues and customers</li> <li>• Entrepreneurial skills to seize the opportunities of low-carbon technologies and environmental mitigation and adaptation</li> <li>• Occupational safety and health (OSH)</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical thinking (including risk and systems analysis) to interpret and understand the need for change and the measures required</li> <li>• Coordination, management and business skills that can encompass holistic and interdisciplinary approaches incorporating economic, social and ecological objectives</li> <li>• Innovation skills to identify opportunities and create new strategies to respond to green challenges</li> <li>• Marketing skills to promote greener products and services</li> <li>• Consulting skills to advise consumers about green solutions and to spread the use of green technologies</li> <li>• Networking, IT and language skills to perform in global markets</li> <li>• Strategic and leadership skills to enable policy-makers and business executives to set the right incentives and create conditions conducive to cleaner production, cleaner transportation</li> </ul>

Source: ILO 2018, *Skills for green jobs, Country reports*.



The rising importance of green-related jobs brings radical changes in skill needs. These, in turn, must be reflected in education and training provision at all qualification levels. VET will be crucial to providing skill sets that evolve flexibly and reflect the dynamic nature of the new green paradigm. Large number of the skills needed for the transition to green and sustainable economies and societies concern the smart use of clean technologies. Digital skills have become so important that they are increasingly considered both technical and transversal, depending on how advanced they are. This is why the European Commission, in its New Skills Agenda (Action 6), labels the digital and green transitions as ‘twin transitions’ (CEDEFOP, 2022a). To address skill mismatches effectively and provide sustainable upskilling and reskilling pathways, VET supply must be powered by forward-looking skills intelligence providing insight into green and digital skill needs.

### 2.3. Goals and objectives

General idea of the project is to prepare employees of the SMEs for the sustainable digital transformation. General objective of the course is then:

**Improve the skills and competences of employees in small and medium-sized businesses to accelerate the digital transformation for sustainable development.**

The following specific goals have been set for this curriculum:

G1 – Define a profile of expert in sustainable digital transformation with associated knowledge, skills, and competencies

G2 Transform entrepreneurs' thinking to act in the era of sustainable digital transformation

G3 Promote the skills and operational tools necessary to manage the implementation of new digital technologies that are sustainable

G4 Improve and foster a deep understanding of sustainable digital transformation and its impact on business reality, as well as business and social relationships

G5 Build soft and hard skills to structure, organize and control innovation and digital transformation processes

G6 Increase business efficiency through use of sustainable digital technologies

G7 Improve the understanding and ability to manage change and challenges for digital economy companies

G8 Introduce new teaching methods such as edutainment, case studies, simulations

G9 Encourage learners to think critically about the globalising world, looking for lasting solutions and a holistic approach

G10 Acquire knowledge about sustainable digital technologies, as well as learn how to apply them

Measurable objectives that can be used with regards to the curriculum:

- a) Number of visitors of the platform,
- b) Number of trainees registered on the platform,
- c) Number of trainees taking the course,
- d) Number of trainees going through the web based self-assessment test,
- e) Number of check-ups run in the companies.

#### 2.4. Educational strategies

The COVID-19 crisis has led to reductions in work-based learning opportunities for vocational education and training (VET) trainees. Shortages of work-based learning opportunities will mean that some current VET trainees not always obtain the practical learning needed to graduate. Even, as the COVID -19 does not affect the educational system so much at the moment, educational strategies for VET must include more practical training within the school-based training, including also online school-based education. It can be delivered through more practical component of VET in the classroom, e.g. through workshops and hands-on laboratory activities. Education strategies should also include more inclusive education, which has been largely ignored in last years, whereas COVID -19 has underlined the importance of this kind of educational characteristic. Within the IDEA<sup>1</sup> project there were some recommendations developed, which refer to higher educational system, but they can largely refer to VET as well, especially in the school-based subsystem. There are the following (IDEA, 2022):

- Inclusiveness and engagement strategies in digital education have to be tailored for different trainee groups based on their backgrounds, profiles and behaviours,
- Training and upgrading staff, and to some extent trainees', skills is a necessity. This refers not only to digital skills but also to cultural and interpersonal ones,
- Face to face education remains essential to humanize the learning experience and implement practical activities,
- Digital technologies should be applied to transform educational pedagogies and support learning journeys, but not relied upon as the core proposition,
- Content and methods need to be designed specifically for online environments,
- A shared understanding and coordination of inclusive strategies in digital education is needed among the different schools, departments, admission and trainee support offices in HEIs.

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<sup>1</sup> The IDEA (Inclusive Digital Education Access) project 2021-2023, led by EFMD, more information <https://theideaproject.eu/>



Then it is crucial to combine those elements and implement them into educational strategies that includes more constructivist approach. The following pedagogical approach are suggested to be used while executing education process according to that curriculum (Pietrzykowski, 2019, 32-34):

- progressive education: emphasis put on learning by doing, which is of particular importance in VET; integrated curriculum focused on thematic units (here green, sustainable and digital economy); strong emphasis on literacy, engineering, digital skills, problem solving, critical thinking; team work, development of social skills; collaborative learning projects; personalized learning; blended learning; emphasis on lifelong learning and social skills; tutor works not in the position of authoritarian, but rather as facilitator of the discussion or a group leader; movement for physical and mental health is recommended to create a sound body and mind,
- experiential learning: refers to the experience of the trainee; the trainee has to be actively involved in the experience and must be able to reflect on that experience, then use analytical skills to conceptualise the experience and finally make decision how to use new ideas gained from the experience – these four stages are the key elements of the Kolb learning cycle; people by their nature prefer a certain autonomous learning style affected by different factors and go through three stages of personal development, which are: acquisition (birth to adolescence) – acquiring basic abilities and cognitive structures; specialisation (schooling, early work and personal experiences of adulthood) – development of a particular specialised learning style affected and influenced by their own background; and finally, integration (from mid-career on) – expressing a non-dominant learning style in all life domains,
- situated learning: a model of learning in a community or practice – in this sense, the classroom is not determined, and it can be a very random place; trainees become a part of the community through the learning process; they understand and experience the world, as well as knowledge, through the constant interactions by which they reconstruct their identity and evolve the forms of their membership in the community as their relationships change. In situated learning, no importance is given to the retention of the content; learning begins with people trying to solve problems; when learning is problem-based, people explore real-life situations to find answers, or to solve the problems,
- service learning: community oriented – combines learning objectives with community service in order to provide a pragmatic, progressive learning experience while meeting societal needs; it covers the following hands-on learning methods: volunteerism, community service and internship; trainees get tasks combined with delivering value for society, which enables them to practically use the theoretical knowledge acquired during formal education; the lessons learned from these situations are discussed during the lesson, creating a closed circle of school (theory) -practice (experience) -school

(combining experience with theory),

- **problem-based learning:** trainees learn about a subject through the experience of solving an open-ended problem, usually in small groups with a tutor to facilitate discussion; trainees set their own goals and conduct their own research before coming to the group by individually searching for materials related to the topic; every person in the group has a role to play; fosters active learning, and also retention and development of lifelong learning skills; it encourages self-directed learning by confronting trainees with problems and stimulates the development of deep learning; it encourages trainees to activate prior knowledge and build on existing conceptual knowledge frameworks,
- **adult learning:** allows the use of prior, accumulated knowledge as well as work experience and adds to the learning experience; orientation to learning is problem-centred rather than subject-centred; motivation to learn is internal; it improves the social atmosphere and order,
- **cognitive apprenticeship:** the learner, while using cognitive tools and led by the teacher/trainer, can observe, enact, and practice implicit knowledge, thus achieving a successive approximation of mature practice; enculturates learners into authentic practices through activity and social interaction; the model consists of 6 stages: modelling (after observation of the teacher learners can model the desired performance); coaching (hints, feedback, modelling, reminders are provided); conceptual scaffolding (teachers support the learner in accomplishing tasks); articulation (covers any method of getting trainees to articulate their knowledge, reasoning, or problem-solving processes); reflection (the learner reflects on the problem solving task while comparing their own way with the expert one); and finally exploration (trainees are encouraged to explore new ways in which knowledge or skill can be used),
- **constructivist learning:** learners are encouraged to use knowledge derived from their own background in the educational process; emphasizes the importance of the learner being actively involved in the learning process; learners should learn to discover principles, concepts and facts for themselves, hence the importance of encouraging guesswork and intuitive thinking in learners; learners gain meanings through the interactions with each other and with the environment they live in; they gain additional experience due to interactions with the group and community.

The Consortium prepares special forms of educational materials – interactive video training pills. It should cover:

- **Introduction:** a maximum duration of 1 minute, created using Motion Graphics, with a series of images which summarise the topic,
- **Creation in the Studio:** Use of the “Chroma Key” with the application of computer graphic and motion graphic solutions,

- Use of Interactivity - Possibility of accessing the in-depth information recalled by the trainer/presenter in the video to cover the other aspects not included in the OER and which constitute the knowledge baggage that the target Curriculum defined by the partnership. This will allow the viewer to temporarily interrupt the episode and, through the hotspots inserted on the timeline of the video, noted by specific "Key Words", access the different training contents provided, thanks to which the trainee can:
  - download an in-depth pdf or ppt,
  - access a thematic website and/or a portal of the institution and/or reference body,
  - watch a further video and/or slideshow of photographs,
  - listen to an interview and/or other multimedia content.

The interactive video materials together with further investigation materials (FIM) will be followed by the self-assessment tool (used for validation of gained theoretical knowledge), then check-ups (used for practical validation of the knowledge in the company) and finally The Guidebook.

Company check-ups is an activity planned for practical verification of developed solutions, materials, and methodology. It is a guidance on how to use developed methodology in the business practice. One thing is to explore theoretical knowledge, the other to apply the knowledge in practice. Trainees must go through the practical exam on how to use gained information. The check-up should help apply the knowledge. Consortium prepares the methodology of the additional element of the training scheme, that can be used by the business trainers afterwards.

The Guidebook will be used for the demonstration how the training can look like. In particular, the result should improve participants' abilities:

- To organise and contribute effectively to training development work, including training needs analysis, specification of training objectives and design of training schemes,
- To design effective training sessions based on the most appropriate training methods, aids, and materials,
- To conduct such training sessions,
- To evaluate the results of training.

## 2.5. Implementation

To implement the curriculum and ensure its lasting and continuous execution four elements are important:

- a) Proper support from all stakeholders (university staff, authorities, local community, government and its bodies, various NGO councils),
- b) A set implementation plan, covering staff, funds, and facilities,

- c) Operationalization of the plan while dividing it into pilot phase, transition period and full operation period,
- d) Sustainability of the curriculum.

With regards to this curriculum, the following elements are of particular importance:

- 1) Dissemination of the curriculum while making it public and delivering the content to all who are interested. Persuading the university authorities/training Agencies, as well as staff, to use all developed materials and outcomes as supportive materials into the classroom/training session. Tight contact with all stakeholders and gathering continuous feedback from the target group,
- 2) All materials developed in the Consortium will be uploaded to the CONFORM's server (educational platform of one of the consortium members) and kept there for years. All materials will be ready for anyone to use, at any time. Because of the online content, it does not require special funds to be kept there. Also, a self-assessment tool will be launched online. The educational platform is a place, where many educational materials and results of different projects have been gathered which enriches the value of the materials. The only cost that can be associated with the curriculum is the administration of resources and server maintenance costs, which are kept anyway as part of the Partner's infrastructure,
- 3) The curriculum will be tested by the target group representatives just after launch – this will be the pilot phase. After gathering feedback, proper improvements will be implemented and the final version of the educational platform will be launched, which will begin the platform exploitation phase.
- 4) The sustainability of the outcome has to be guaranteed by the quality of the tools. The maintenance costs of the infrastructure are pretty low, so the sustainability depends mostly on the quality of courses, materials and other tools gathered on the platform. Since the quality will be good, trainees will be eager to use the materials for their own education, at which point the Consortium has to put special attention towards evaluation and the pilot phase.

## 2.6. Evaluation and feedback

Curriculum evaluation is the process of measuring and judging the extent to which the planned courses, programmes, learning activities and opportunities as expressed in the formal document produce the expected results. This process can enable decisions to be made about improvements and future progress, if delivered and run effectively. Evaluation is a decisive and integral part of both the formal and informal planning cycles. The tasks of the program evaluation are:

- determining whether the program is to be continued or interrupted,
- improving its structure or its implementation,
- providing critical information for strategic changes and policy decisions,
- adding or removing certain working techniques,
- determining which of the competing programs are worthwhile for allocating funds,
- providing indicators for monitoring,
- endorsing or opposing the philosophy of a given program.

The most important element of the process is finding the right people to evaluate the program. The target group in the case are Trainees, Trainers (VET Providers), SMEs representatives. Curriculum will be assessed by one of the external academics. Then there will be also other ways of evaluation. Trainees will be invited to evaluate elements of the curriculum. The call for participation will be opened to:

- any employee of the company coming from SME sector,
- managerial staff from the companies of different sectors,
- trainees with disabilities, who will be given preferences,

Also, trainers will be asked for their assessment of the prepared materials. From all gathered feedback, the report will be prepared. The evaluation will be run once a year to get the curriculum updated and adjusted to changing the circumstances of the environment.

### 3. Division of hours

The division of hours, as prepared by the Consortium, consists of min 375 hours, from this 345 is an individual work of the Trainees (Table 1). Very important feature if this curriculum is practical validation of the gained knowledge. Since the curriculum has been designed for VET education, trainees have to check whether knowledge that they gained is being applicable or has been applied already in companies that they work in. 75 hours and 3 ECTS points have been assigned for check-ups within the company.

**Table 1: Division of hours (materials developed within the DiSuDeSME project)**

VET education/postgraduate	ECTS	No of hours	Lecture	Other contact hours	Individual Trainees'	Exam/ other
Sustainable management approach and strategies	1	25	2	0	22,5	0,5
The role EU policy and regulations in SME development processes	1	25	2	0	22,5	0,5
Sustainable digital marketing strategies	1	25	2	0	22,5	0,5
Circular economy	1	25	2	0	22,5	0,5



# Erasmus+

Environmental waste disposal	1	25	2	0	22,5	0,5
Technologies for circular economy	1	25	2	0	22,5	0,5
Digital transformation	1	25	2	0	22,5	0,5
Digital workforces	1	25	2	0	22,5	0,5
Social aspect of sustainability	1	25	2	0	22,5	0,5
Sustainable digitalisation	1	25	2	0	22,5	0,5
Adopting eco-friendly power sources	1	25	2	0	22,5	0,5
Sustainable business ecosystems	1	25	2	0	22,5	0,5
Practical validation	3	75	0	0	75	0
Total ECTS/semester	15	375	24	0	345	6
Total hours in the Semester	375					

## 4. Modules description

	Expectations	Explanation
1	Title of the module	<b>Innovation - enabling policy &amp; regulation</b>
2	Short description of the content	<p>The aim of the course is to provide knowledge that will allow its listeners to actively influence shaping the quality of human life in the environment. Trainees will learn what management of sustainable development is and how modern digital technologies apply to it. Trainees will also learn what are the most important criteria for evaluating the implementation of economic tasks in the context of the sustainable development strategy and the basic instruments of environmental management. The acquired knowledge can be extremely useful in creating environmental plans and programs at the level of local administration. Trainees will learn the importance of creating the right pro-action environment for creating innovation, how the European Union creates the law to accelerate the development of digital and ecological business solutions. They will also learn about digital marketing focused on sustainable development. This module consists of the following units:</p> <p><b>Unit 1.1. Sustainable management approach and strategies</b></p> <p><b>Unit 1.2. The EU policy and regulations in SME development processes</b></p> <p><b>Unit 1.3. Sustainable digital marketing strategies</b></p>
3	Expected learning outcomes	<p>The following learning outcomes are expected in the module:</p> <p>1. Knowledge:</p> <ul style="list-style-type: none"> <li>• Understanding of their social responsibility as future professionals and citizens</li> <li>• Understanding of the ethical responsibility, towards present and future generations.</li> <li>• Understanding of the impact that human activities have on the Planet, regarding sustainable and unsustainable resources appropriation,</li> </ul>





- Identification and specification of underlying scientific methodologies and connected human-environment issues
- Knowledge of global trends that impact the life quality of present and future generations
- Recognising the trends shaping the modern economy and understanding the opportunities and challenges faced by managers and governments in relation to the sustainable digitalisation
- Understanding the system and importance of legal framework and its role in enhancing business operations
- Knowledge about the role of key political actors, such as interest groups and political parties, in the EU political system
- Recognition of digital megatrends and best practices – and the disruptive impact they will have on the business
- Knowledge of key determinants of marketing decision-making on the foreign markets
- Awareness of the key research works concerning contemporary marketing
- The knowledge of key determinants of the marketing decision-making on B2B and B2C markets

## 2. Skills:

- An ability to define sustainability and identify major sustainability challenges
- An ability to apply assessment criteria or sets of principles or available tools related to sustainability in their own discipline
- An ability to establish the connections to the triple bottom line and other sustainable development dimensions that influence their own knowledge discipline
- An ability to initiate and apply collective problem solving and innovation strategies, as well as crisis resolution strategies





- An ability to critically assess innovation areas of transitional processes, their drivers, and vulnerabilities
- An ability to design processes, products and components considering the life cycle analysis using the appropriate sustainable development dimensions constraints.
- An ability to describe and analyse changes related to the development of sustainable digital technologies and the implementation of new business models to the economy
- An ability to use the acquired knowledge in the field of the functioning of the digital economy to analyse business models used by market participants
- An ability to integrate knowledge, handle uncertainty and complexity, design and implement innovation spaces, and formulate judgements and communicate them to a wider audience
- A recognition of the basic techniques of creative thinking and creative problem solving
- An ability to collect materials and present the results of their work with the use of ICT
- An ability to implement the needed actions to foster sustainability in their professional and personal life
- An ability to discuss the EU policies, the institutional arrangements behind them, and their possible implications
- An ability to develop a digital marketing plan that will address common marketing challenges
- An ability to recognize Key Performance Indicators tied to any digital marketing program
- An ability to critically review the current research concerning marketing topic
- An ability to evaluate the marketing decisions on the domestic and foreign markets

### 3. Competencies:

- Graduates think critically and independently but constructively

		<ul style="list-style-type: none"> <li>• Graduates are ready to build an argument based on a variety of sources, and to initiate a dialogue between those sources</li> <li>• Graduates are professionals, open to multiple perspectives of scientific areas and stakeholders' groups, critical, committed to knowledge-based initiatives, reflective, when implementing changes, and assessing results</li> <li>• Graduates are sensitive to cultural, intercultural, and multicultural issues</li> <li>• Graduates are capable of evidence-based independent decision-making and are responsible promoters of inventions and innovation in sustainable digital transformation area</li> <li>• Graduates are self-confident, realistically recognize professional perspectives and opportunities for action</li> <li>• Graduates are able to work in a team, carrying out entrusted tasks in a professional and responsible manner, preparing team projects in the field of creative thinking</li> <li>• Graduates show initiative and present their own ideas with appropriate argumentation, know how to engage in polemics, accept criticism and react to it constructively</li> <li>• Graduates demonstrate the ability to work in a team and communicate within the group, including communication with participants of the IT system and using a smartphone and appropriate software.</li> </ul>
4	Length of the module	<p>Each unit of the module should contain:</p> <ul style="list-style-type: none"> <li>• Unit description (what is the course about, learning outcomes, prerequisites, course requirements)</li> <li>• E-learning: 5-10 min length of video interactive training pills</li> <li>• Further investigation materials – 3-5 hours</li> <li>• Practical validation of the knowledge - Check-up in the company – ca 20 hours</li> </ul>

		<ul style="list-style-type: none"> <li>• Indication of additional courses trainee should take and references for individual learning – 60 hours</li> <li>• Evaluation – 15-30 minutes of self-evaluation test</li> </ul>
5	Learning topics	<ul style="list-style-type: none"> <li>• Economic sustainability</li> <li>• New business models</li> <li>• EU policies and regulations</li> <li>• Technologies for digital transformation</li> <li>• Green marketing strategy</li> <li>• Trends in digital transformation</li> </ul>
6	Learning materials	<ul style="list-style-type: none"> <li>• Video</li> <li>• PowerPoint presentations</li> <li>• Articles</li> <li>• Books</li> </ul>
7	Learning methods	<ul style="list-style-type: none"> <li>• Class, e-learning, movie</li> </ul>
8	Evaluation	<ul style="list-style-type: none"> <li>• Self-assessment test.</li> </ul>

	Expectations	Explanation
1	Title of the module	<b>The model of circular Economy</b>
2	Short description of the content	<p>The need to popularize the circular economy and sustainable development has never been so urgent. The key role in environmental management is played by standards that help companies save energy and money and protect nature.</p> <p>The benefits of a more sustainable and circular economy at a global level include optimizing material use, new and innovative revenue streams, better use of waste, faster and more complete recycling, improved stakeholder relationships and brand reputation, and reduced risk.</p> <p>The aim of the module is to discuss the methods of implementing and financing the circular economy (CE), in particular: assumptions and principles regarding circular economy, carbon footprint and environmental footprint as the basic indicators of circular economy, current and upcoming legal regulations regarding the implementation of circular economy in the short, medium and long term long-term and methods of implementation as well as internal and external financing of the circular economy in the enterprise.</p>

		<p>Trainees will also learn about waste management in enterprises and technologies used in the circular economy</p> <p>This module consists of the following units:</p> <p><b>Unit 2.1. Circular economy</b></p> <p><b>Unit 2.2. Environmental waste disposal</b></p> <p><b>Unit 2.3. Technologies for circular economy</b></p>
3	Expected learning outcomes	<p>The following learning outcomes are expected in the module:</p> <p>1. Knowledge:</p> <ul style="list-style-type: none"> <li>• Understanding the basic features of the circular economy</li> <li>• Understanding the rationales standing behind circular resource management of SMEs</li> <li>• Familiarity with energy sources and pollution control issues</li> <li>• Recognition of issues of energy efficiency and effectiveness</li> <li>• Understanding and critical assessment of the strengths and limitations of the main digital business concepts and ideas</li> <li>• Understanding the main issues surrounding digital technologies created for circular economy</li> <li>• Understanding role of regulations towards circular economy</li> <li>• Understanding the importance of modern technologies used in the contemporary business operations</li> <li>• Recognition of main business operations related to circular economy topic</li> <li>• Explaining the role of SMEs operations in pollution control.</li> </ul> <p>2. Skills:</p> <ul style="list-style-type: none"> <li>• An ability to apply the idea of sharing, leasing, reusing, repairing, refurbishing, and recycling of existing materials and goods to operations of SMEs</li> </ul>



- An ability to evaluate the degree to which SMEs operations are oriented towards circular resource management
- An ability to evaluate the use of energy in different sectors in EU
- An ability to recognize environmental cost of inefficient waste management system
- An ability to plan modern and effective waste management systems
- Ability for critical evaluation of the main tools and information sources used by technology decision makers and users
- Demonstration of critical skills in assessment of the new digital technologies
- Demonstration to use digital technologies in waste management operations
- An ability to reflect on energy efficiency and energy sources used in SMEs operations
- An ability to solve issues related to automated and connected transport of SMEs
- Ability to use appropriate estimation methods in the case of research conducted via the Internet

### 3. Competencies:

- Graduates discuss and contribute to problem-solving in the field of circular economy, in collaboration with various stakeholders
- Graduates are oriented towards circular solutions possible to be implemented by SMEs in green transformation
- Graduates develop the communication skills necessary to facilitate high performance team formation and maintenance (e.g., leveraging the skills and abilities of all team members, valuing cross-disciplinary/cultural contributions, engaging in difficult conversations and resolving conflict)
- Graduates develop self-awareness of personal leadership style and how to effectively work as a member of a team

		<ul style="list-style-type: none"> <li>• Graduates have the capability to analyse and accurately explain complex business processes related to circular economy</li> <li>• Graduate can independently develop and complement knowledge in the field of data analysis</li> </ul>
4	Length of the module	<p>Each unit of the module should contain:</p> <ul style="list-style-type: none"> <li>• Unit description (what is the course about, learning outcomes, prerequisites, course requirements)</li> <li>• E-learning: 5-10 min length of video interactive training pills</li> <li>• Further investigation materials – 3-5 hours</li> <li>• Practical validation of the knowledge - Check-up in the company – ca 20 hours</li> <li>• Indication of additional courses trainees should take and references for individual learning – 60 hours</li> <li>• Evaluation – 15-30 minutes of self-evaluation test</li> </ul>
5	Learning topics	<ul style="list-style-type: none"> <li>• Circular economy</li> <li>• Energy efficiency and effectiveness</li> <li>• Waste management SMEs</li> <li>• Digitally managed packaging initiative</li> <li>• Product passports</li> </ul>
6	Learning materials	<ul style="list-style-type: none"> <li>• Video</li> <li>• PowerPoint presentations</li> <li>• Articles</li> <li>• Books</li> </ul>
7	Learning methods	<ul style="list-style-type: none"> <li>• Class, e-learning, movie</li> </ul>
8	Evaluation	<ul style="list-style-type: none"> <li>• Self-assessment test</li> </ul>

	Expectations	Explanation
1	Title of the module	<b>Socially responsible digital transformation</b>
2	Short description of the content	Digital transformation is not a separate value but should serve the common good. It can be carried out efficiently and effectively serving a given organization and society. The aim of this course is to present a consciously implemented digital transformation, embedded in the realities of the social / public sector. The conscious digital transformation of

		<p>organizations and social activists should be perceived as a process of a holistic change in the way organizations/institutions/network's function, oriented towards values important to the organization and considering the perspective of the common good. Trainees will learn about the course of digital transformation and its consequences for business processes or the labour market. Trainees will understand the importance of digital transformation for today's business and enterprises in the future and will be able to use their knowledge to prepare a plan for organizational changes resulting from digitization processes. The points of contact of digital solutions and socially responsible digital economy will be discussed. This module consists of the following units:</p> <p><b>Unit 3.1. Digital transformation</b></p> <p><b>Unit 3.2. Digital workforces</b></p> <p><b>Unit 3.3. Social aspects of sustainability</b></p>
3	Expected learning outcomes	<p>The following learning outcomes are expected in the module:</p> <p>1. Knowledge:</p> <ul style="list-style-type: none"> <li>• Understanding of digital disruption drivers</li> <li>• Knowledge of the essence of the digital transformation of the economy and business.</li> <li>• Recognition which business areas are affected by the deepest changes in digital transformation and what is the essence of these changes.</li> <li>• Recognition ways in which digital transformation supports green transformation</li> <li>• Familiarity with technology for digital workforce, the usage of robots</li> <li>• Understanding the consequences of robotics for the labour market</li> <li>• Explaining the impact of digital transformation on labour market and company's performance</li> <li>• Explaining differences between various economics and social indicators</li> <li>• Understanding the concept of ESG</li> </ul>

		<ul style="list-style-type: none"> <li>Understanding the role and consequences of ESG for the modern world and business</li> </ul> <p>2. Skills:</p> <ul style="list-style-type: none"> <li>An ability to analyse the organisational and team capabilities needed to support digital-ready business</li> <li>Acquiring the innovation capabilities to generate more insights and transform these insights into new businesses</li> <li>An ability to diagnose the level of digital maturity of the organization and propose directions for change.</li> <li>An ability to prepare a plan of changes related to sustainable digital transformation in a selected area of the organization's functioning</li> <li>An ability to prepare the assumptions of the company's strategy related to the process of sustainable digital transformation</li> <li>An ability to analyse modern labour market</li> <li>An ability to calculate various social and economic indicators</li> <li>An ability to estimate EGS factors</li> <li>An ability to assess environmental risk</li> </ul> <p>3. Competencies:</p> <ul style="list-style-type: none"> <li>Graduates demonstrate the ability to work independently and in a team.</li> <li>Graduates can use knowledge in the field of digital transformation in solving practical problems.</li> <li>Graduates are sensitive towards environmental issues</li> <li>Graduates demonstrate the readiness to accept new approach towards green and digital transformation</li> <li>Graduates are ready to accept new rules of green digital transformation</li> <li>Graduates are engaged into environmental issues and activities</li> </ul>
4	Length of the module	<p>Each unit of the module should contain:</p> <ul style="list-style-type: none"> <li>Unit description (what is the course about, learning outcomes, prerequisites, course requirements)</li> </ul>



		<ul style="list-style-type: none"> <li>• E-learning: 5 -10 min length of video interactive training pills</li> <li>• Further investigation materials – 3-5 hours</li> <li>• Practical validation of the knowledge - Check-up in the company – ca 20 hours</li> <li>• Indication of additional courses trainees should take and references for individual learning – 60 hours</li> <li>• Evaluation – 15-30 minutes of self-evaluation test</li> </ul>
5	Learning topics	<ul style="list-style-type: none"> <li>• Impact of digitalisation on enterprise</li> <li>• Trends in digital transformation</li> <li>• Digital workforce</li> <li>• Social aspects of sustainability</li> <li>• Economics and social indicators</li> <li>• Data platform of ESG-related information</li> </ul>
6	Learning materials	<ul style="list-style-type: none"> <li>• Video</li> <li>• PowerPoint presentations</li> <li>• Articles</li> <li>• Books</li> </ul>
7	Learning methods	<ul style="list-style-type: none"> <li>• Class, e-learning, movie</li> </ul>
8	Evaluation	<ul style="list-style-type: none"> <li>• Self-assessment test</li> </ul>

	Expectations	Explanation
1	Title of the module	<b>Green(er) technologies</b>
2	Short description of the content	<p>Digitalisation can support transitions towards a more sustainable society if technologies and processes are designed in line with suitable criteria. This requires a systemic focus on the risks and benefits of digital technologies across the three dimensions of sustainable development: the environment, society, and the economy. In this module, trainees find out what the sustainable digitalisation is, what are enablers of digitalisation, how to use datasets for sustainable development and more efficient energy use. They will also learn how we improve quality of our life through digitalisation.</p> <p>The module consists of the following units:</p> <p><b>Unit 4.1. Sustainable digitalisation</b></p> <p><b>Unit 4.2. Adopting eco-friendly power sources</b></p>

		<b>Unit 4.3. Sustainable business ecosystems</b>
<b>3</b>	Expected learning outcomes	<p>The following learning outcomes are expected in the module:</p> <p>1. Knowledge:</p> <ul style="list-style-type: none"> <li>• Understanding the concept of sustainable digitalisation and technologies that are behind</li> <li>• Understanding the role of new green technologies for the sustainable development</li> <li>• Knowledge about digitalisation enablers</li> <li>• Understanding the importance and role of technology application in the quality of the functioning of economic, social, and public areas</li> <li>• Recognising the tools necessary for data analysis</li> <li>• Understanding the estimation methods used in the case of statistical research conducted on the Internet</li> <li>• Recognising the possibilities of using Big Data for the purposes of statistical research</li> </ul> <p>2. Skills:</p> <ul style="list-style-type: none"> <li>• An ability to analyse needs of the organisation in terms of sustainable digital transformation</li> <li>• An ability to enhance digitalisation drivers</li> <li>• An ability to search, gather, evaluate, and critically interpret economic and technical information</li> <li>• A demonstration of critical skills in assessment of the new digital technologies</li> <li>• An ability to analyse large datasets</li> <li>• An ability to use dataset analysis for business purpose (changing large dataset into business intelligence)</li> <li>• An ability to indicate the area of application of new technologies in the management of public sector organizations, as well as in the sphere of city management and other areas of the economic environment of the organization</li> <li>• An ability to implements strategies of energy saving strategies</li> <li>• An ability to design a new human team for the planned tasks of production activities</li> </ul>

		<ul style="list-style-type: none"> <li>• An ability to effectively manage the organization's resources</li> <li>• Aa ability to share information and digital resources</li> <li>• An ability to use the advanced functions of various communication tools</li> </ul> <p>3. Competencies:</p> <ul style="list-style-type: none"> <li>• Graduates are sensitive towards environmental issues</li> <li>• Graduates are conscious of the consequences of digital transformation for the business operations and its impact on the planet</li> <li>• Graduates demonstrate the ability to put the acquired knowledge on the potential of technology into practice in the social, public and ecological economic spheres in order to significantly improve the quality of their functioning</li> <li>• Graduates appreciate the importance of cooperation between team members, and react to emerging conflicts</li> <li>• Graduates can work in a group, assuming various roles, in particular the role of a leader</li> <li>• Graduates prioritize appropriately to accomplish both their own and team tasks</li> <li>• Graduates are able to use knowledge in the field of digital transformation in solving practical problems</li> </ul>
4	Length of the module	<p>Each unit of the module should contain:</p> <ul style="list-style-type: none"> <li>• Unit description (what is the course about, learning outcomes, prerequisites, course requirements)</li> <li>• E-learning: 5-10 min length of video interactive training pills</li> <li>• Further investigation materials – 3-5 hours</li> <li>• Practical validation of the knowledge - Check-up in the company – ca 20 hours</li> <li>• Indication of additional courses trainees should take and references for individual learning – 60 hours</li> <li>• Evaluation – 15-30 minutes of self-evaluation test</li> </ul>
5	Learning topics	<ul style="list-style-type: none"> <li>• Sustainability-oriented digital technologies</li> <li>• Enablers of the digitalisation</li> </ul>

		<ul style="list-style-type: none"> <li>• Big Data and Artificial Intelligence</li> <li>• Energy efficiency and effectiveness</li> <li>• How digitalisation can improve sustainability</li> <li>• Software-and hardware openness</li> </ul>
6	Learning materials	<ul style="list-style-type: none"> <li>• Video</li> <li>• PowerPoint presentations</li> <li>• Articles</li> <li>• Books</li> </ul>
7	Learning methods	<ul style="list-style-type: none"> <li>• Class, e-learning, movie</li> </ul>
8	Evaluation	<ul style="list-style-type: none"> <li>• Self-assessment test.</li> </ul>

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# Research results – focus groups

## 6. Introduction (research-methodology)

### Definition issues:

**Digital transformation** is the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to customers.

**Sustainable development** meets the needs of the present whilst ensuring future generations can meet their own needs. It has three pillars: economic, environmental, and social.

**Sustainable digital transformation** – the process of digitalisation the economy in a long-lasting, green, and organic way. It should enhance transition to green and digital economy, built on two pillars: innovation of SMEs and their business ecosystems.

### Assumptions:

Research aimed at establishing curriculum content on sustainable Digital Transformation. An innovative blended training scheme on Sustainable Digital Transformation in SMEs, which should prepare companies to adjust to the virtual business environment and take advantage of the participation in the processes of sustainable digital transformation.

Model (as output of survey) will let to indicate the profile of the trainees together with expected skills and qualifications, most significant topics related to sustainable digitalisation.

The methodology covers the following steps:

- 1) Desk Research on the key issues – report - Appendix A (academic Partners)
- 2) Recapitulation, identification of crucial topics (result leaders + SCUEP)
- 3) Focus group (all Partners) – questionnaire (Appendix B)
- 4) Recapitulation of the focus groups with setting structure of the curriculum (All Partners)
- 5) Elaboration of the curriculum (result leaders + SCUEP) – final document.

Target group:

- The SMEs' representatives, dealing and managing business operations,
- SMEs employees dealing with digital technologies or preparing to use them in the business reality,
- Business trainers dealing with business education, both on formal and informal levels.

## 7. Survey analysis