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VETECH Database on Digital practices adoption in SMEs

Annex 1:

Consolidated Country-specific National Report for Hungary, Bulgaria and Greece

VETech

Project name: VETech - Digital Skills for Tomorrow's SMEs
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Contents

Desk Research

All partners have conducted a country-specific literature review, focusing on the digital transformation landscape in their respective countries (Hungary, Bulgaria, and Greece). These researches provided valuable data used to analyse national policies, trends, and challenges related to digital transformation for SMEs, digital skills in VET, and best practices in training methodologies.

Section 1: Introduction

Digital transformation is a priority topic across all three VETech consortium countries - Hungary, Bulgaria, and Greece - particularly concerning the modernization of small and medium-sized enterprises (SMEs) and the alignment of vocational education and training (VET) with evolving digital demands. Despite varied starting points, each country is working to bridge the digital skills gap and improve technological adoption across sectors. Hungary, Bulgaria, and Greece share a common ambition: to harness digital transformation as a lever for economic modernization and educational reform. While each country faces unique structural and strategic challenges, they converge on the need to better align VET systems with SME digital needs, supported by national policies and EU frameworks. This consolidated report aims at providing key findings contributing to the creation of targeted tools, databases, and training modules under the **VETech – Digital Skills for Tomorrow's SMEs** initiative.

Among the common challenges faced are the significantly low ranking in the [EU's Digital Economy and Society Index (DESI) 2022](#): Hungary is at 22nd place, Bulgaria ranges 26th, and Greece occupies 25th place out of 27 countries. According to [2024 Digital Decade Report](#), only 58,9% of the Hungarian population, 35,5% of Bulgarians, and 52,4% of the Greek population have basic digital skills. In all three countries, over 99% of businesses are SMEs, but although performing very well in terms of digitalisation of public services for business (BG: 91.9%, GR: 86,2%, HU: 74,9 %), Companies face barriers such as lack of funding, resistance to change, and insufficient digital training resulting in low levels of Enterprises' adoption of advanced digital technologies (BG: 29,3%, GR: 43.3%, HU: 37.1%).

In response, the Greek government launched ambitious strategies like the ["Digital Transformation Bible 2020–2025,"](#) which outlines a holistic vision and over 400 projects to digitize public and private sectors while developing digital skills among citizens, educators and professionals.

The [Hungary's Recovery and Resilience Plan](#) includes several measures that target digital skills, mostly in the form of establishing or improving the tools and facilities needed to develop digital

competences. In line with the Digital Decade, Hungary's new National Digitalisation Strategy 2022-2030 acknowledges that improvements in digital skills at all levels are essential to enable the digitalization of businesses and public sector. The goal of Hungary is to be as well prepared as possible for the inevitable digital transformation and to be among the top ten European countries in terms of digitalization by 2030.

Bulgaria focuses on understanding digital maturity through national research and stakeholder surveys, resulting in several national strategies aimed at modernizing the economy, public services, and education systems. Central to this agenda is the National Development Programme: Bulgaria 2030, which prioritizes digital connectivity, smart specialization, and enhanced digital skills. Another pivotal document is the Digital Transformation Strategy for SMEs, which outlines Bulgaria's roadmap for equipping small businesses with the tools and competencies needed to thrive in an increasingly digital environment.

Within this context, the **VETech – Digital Skills for Tomorrow's SMEs** project focuses on how vocational education and training (VET) can equip both learners and trainers with the digital skills needed for SME digital transformation.

This report addresses the following core themes:

- the current state of digital adoption in SMEs,
- the readiness of VET institutions and learners for digital transformation,
- effective training approaches that bridge the gap between education and labour market needs,
- relevant national policy frameworks,
- successful case studies,
- specific challenges experienced by different target groups in the field of digitalisation

The aim is to provide an analytical, data-driven overview and identify key insights and recommendations that will inform the VETech toolkit and database, ultimately helping bridge the digital skills gap in Europe's VET and SME sectors.

Section 2: Overview of Digital Transformation per country

Definition of the digital transformation at national levels:

The National Digitalization Strategy (NDS) of **Hungary** 2022–2030 does not contain a single, explicit definition of digital transition, however, its interpretation and set of goals emerge from the strategy as a whole. According to the document, digital transition is a comprehensive, necessary process, the aim of which in Hungary is to place digital infrastructure, economy, education and public services at

the centre of its competitiveness and modernization efforts. The digital transition is built on four main pillars: digital infrastructure, digital competences, digital economy and digital state. Together, these areas ensure the successful implementation of the digital transition, facilitating the digital transformation of the economy and society.

In the context of **Bulgaria**, the concept of digital transformation is understood as a comprehensive and strategic process that integrates digital technologies across all sectors of the economy, public administration, and education. This concept is elaborated in several key national strategic documents, including the *National Development Programme: Bulgaria 2030*, the *National Strategy for the Development of Artificial Intelligence*, and the *National Recovery and Resilience Plan*. These strategies frame digital transformation not merely as a technical upgrade, but as a fundamental shift in how Bulgarian society functions, produces, learns, and communicates. At its core, digital transformation in Bulgaria is seen as the systemic adoption and integration of advanced digital tools and platforms, such as cloud computing, artificial intelligence (AI), and the Internet of Things (IoT), into the daily operations of businesses, educational institutions, and the public sector. Digital transformation is also understood as a tool for dynamic digital economy driven by innovation, social inclusion, regional development, and a strategic cultural shift that requires coordinated action from government, educational institutions, industry, and civil society to succeed.

A central pillar of Bulgaria's digital transformation strategy is the enhancement of digital competencies across the population. Policymakers emphasize the urgent need to raise digital literacy levels, upskill and reskill the workforce, and integrate digital content more robustly into education at all levels.

Greece defines digital transformation in comprehensive terms through its national strategy. The Ministry of Digital Governance's flagship plan – commonly known as the *"Digital Transformation Bible 2020–2025"* – articulates a broad vision to modernize the economy and society via technology. This strategy emphasizes not only the digitization of public services and business processes, but also the cultivation of digital skills across the population. It includes integrating digital skills into education curricula, establishing a Digital Citizens' Academy for continuous online learning, and other initiatives to foster a digitally literate workforce. In essence, Greece's official approach frames digital transformation as a holistic endeavour encompassing infrastructure, e-government, business innovation, and human capital development.

Current level of digitalization among SMEs:

HUNGARY

The vast majority of Hungarian businesses affected are not prepared for the changes that will transform the production or service process, product development, and entire supply and supplier chains, which could fundamentally shake the competitiveness of these companies within 5 years.

According to a comparative survey by the European Union, SMEs in Hungary use digital technologies to a more limited extent than in other economies.

The coronavirus crisis has presented a new situation for domestic businesses (as well), with digital solutions, such as the shift to mass working from home or online sales and delivery, playing an increasingly important role in the lives of companies. It seems that more and more economic actors have noticed this and have taken steps to develop in this area.

However, micro-enterprises have the worst digital readiness, and relatively few development policy programs have been available to them so far.

On the 'Integration of digital technology in enterprises' activities (DESI 2022), Hungary ranks 25th among EU countries.

Among the leading economic sectors in digital transformation are IT sector, automotive industry, mechanical industry, financial and insurance services, logistics, and energy sectors.

	Hungary			EU	EU
	DESI 2021	DESI 2022	DESI 2023	DESI 2023	2030 target
3a1 SMEs with at least a basic level of digital intensity	NA	NA	52%	69%	90%
% SMEs			2022	2022	
3b1 Electronic information sharing	14%	21%	21%	38%	
% enterprises	2019	2021	2021	2021	
3b2 Social media	12%	13%	13%	29%	
% enterprises	2019	2021	2021	2021	
3b3 Big data	7%	7%	7%	14%	75%
% enterprises	2020	2020	2020	2020	
3b4 Cloud[4]	NA	21%	21%	34%	75%
% enterprises		2021	2021	2021	
3b5 AI	NA	3%	3%	8%	75%
% enterprises		2021	2021	2021	
3b6 e-Invoices	14%	14%	14%	32%	
% enterprises	2020	2020	2020	2020	
3c1 SMEs selling online	13%	18%	20%	19%	
% SMEs	2020	2021	2022	2022	
3c2 e-Commerce turnover	9%	11%	11%	11%	
% SME turnover	2020	2021	2022	2022	
3c3 Selling online cross-border	5%	7%	7%	9%	
% SMEs	2019	2021	2021	2021	

Source: Digital Decade Country Report 2023 – Hungary

BULGARIA

In **Bulgaria**, small and medium-sized enterprises (SMEs) remain notably under-digitalized compared to their European peers. As of 2024, only about 50–51% of Bulgarian SMEs had achieved at least a basic level of digital intensity, versus the EU average of around 73%[1]. In 2023, approximately 14 % of SMEs were using cloud computing - well below the EU mean of 38.9% - and only 13.5 % leveraged data analytics, compared to 33.2% across the EU[2]. AI adoption by SMEs lagged at around 6 %, compared to the EU average of 13.5%[3]. A national survey from March - April 2025 affirmed that while many companies have adopted digital tools, most remain in an intermediate maturity stage: 60% spend less than 10% of their budget on digitization, and only a minority fully integrate advanced technologies like digital twins or blockchain[4]. Barriers such as limited budgets, skill shortages, and reliance on legacy systems continue to constrain SMEs' digital transformation in the country.

Digital maturity varies across sectors. IT, logistics, and retail are generally more digitally advanced, driven by market demands and external pressure. Conversely, traditional industries such as hospitality, agriculture, and manufacturing often lack the incentives or capacity for digital integration.

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[1] ec.europa.eu+7ec.europa.eu+7publications.europa.eu+7

[2] eu.dk+2publications.europa.eu+2digital-strategy.ec.europa.eu+2

[3] eu.dk

[4] bta.bg

	Bulgaria DESI 2021	DESI 2022	DESI 2023	EU DESI 2023	EU 2030 target
3a1 SMEs with at least a basic level of digital intensity	NA	NA	47%	69%	90%
% SMEs			2022	2022	
3b1 Electronic information sharing	23%	22%	22%	38%	
% enterprises	2019	2021	2021	2021	
3b2 Social media	10%	13%	13%	29%	
% enterprises	2019	2021	2021	2021	
3b3 Big data	6%	6%	6%	14%	75%
% enterprises	2020	2020	2020	2020	
3b4 Cloud[4]	NA	10%	10%	34%	75%
% enterprises		2021	2021	2021	
3b5 AI	NA	3%	3%	8%	75%
% enterprises		2021	2021	2021	
3b6 e-Invoices	10%	10%	10%	32%	
% enterprises	2020	2020	2020	2020	
3c1 SMEs selling online	8%	10%	11%	19%	
% SMEs	2020	2021	2022	2022	
3c2 e-Commerce turnover	3%	4%	5%	11%	
% SME turnover	2020	2021	2022	2022	
3c3 Selling online cross-border	3%	4%	4%	9%	
% SMEs	2019	2021	2021	2021	

Source: Digital Decade Country Report 2023 - Bulgaria

GREECE

Despite high-level commitment, **Greek** SMEs currently exhibit low levels of digital uptake relative to EU peers. According to DESI 2022 data, only 39% of SMEs in Greece have at least a *basic* level of digital intensity (use of basic digital tools) – a figure well below the EU average of 55%. This indicates that most small businesses remain at the early stages of digital adoption. In the DESI component "Integration of Digital Technology" (which measures business digitalization), Greece ranked 22nd in the EU, reflecting progress in some areas but overall lagging performance. On a positive note, Greek SMEs outperform the EU average in certain metrics: about 20% of SMEs engage in e-commerce (vs 18% EU average), and 11% of SME turnover comes from online sales (close to the EU average of 12%). Social media usage by businesses is on par with Europe (29% of firms). However, adoption of advanced digital technologies remains limited – for example, only 13% of Greek firms use big data analytics (just below the EU average), and even fewer have adopted cloud computing or artificial intelligence tools, where Greece's rates are *"much lower than the EU average"*. These statistics highlight a two-speed scenario: a minority of Greek enterprises (often larger firms) are embracing

digital tools, while the vast majority of micro- and small enterprises trail behind in digital transformation. The structure of the economy – with an extremely high share of micro enterprises (nearly 72% are solo entrepreneurs and an additional 24% are micro firms) – partly explains this gap. Such micro-SMEs often lack the capacity and resources to invest in digital solutions, dragging down aggregate indicators.

Certain sectors in Greece are leading digital transformation efforts. Industries like telecommunications, banking, and parts of the public sector have implemented digital innovations (for instance, widespread e-banking and e-government services). The pandemic-driven expansion of e-government (gov.gr platform) and digital health applications also positioned the public sector as a driver of change. By contrast, traditional sectors dominant in the Greek SME landscape – such as small retail, tourism/hospitality, and agriculture – have been slower to digitalize. Many of these businesses operate in regional or rural areas with less access to digital infrastructure and know-how, leading to a digital divide. The Hellenic Federation of Enterprises (SEV) has noted that Greek firms overall are increasing their digital maturity, but smaller firms face particular challenges in catching up. A recent SEV study found Greek businesses' digital maturity is improving five times faster than the EU average rate, yet major obstacles persist: resistance to change within organizations, a lack of digital culture, insufficient financing, and shortages of digital skills and know-how were identified as the top barriers to SME digital transformation. These cultural and skill-related barriers are often as significant as technological or financial constraints, underscoring that digital transformation is not purely about technology adoption but also involves mind-set shifts and capacity building.

	Greece DESI 2021	DESI 2022	DESI 2023	EU DESI 2023	EU 2030 target
3a1 SMEs with at least a basic level of digital intensity	NA	NA	41%	69%	90%
% SMEs				2022	2022	
3b1 Electronic information sharing	38%	32%	32%	38%	
% enterprises	2019	2021	2021	2021	
3b2 Social media	19%	28%	28%	29%	
% enterprises	2019	2021	2021	2021	
3b3 Big data	13%	13%	13%	14%	75%
% enterprises	2020	2020	2020	2020	
3b4 Cloud[9]	NA	15%	15%	34%	75%
% enterprises		2021	2021	2021	
3b5 AI[10]	NA	3%	3%	8%	75%
% enterprises		2021	2021	2021	
3b6 e-Invoices	NA	NA	NA	32%	
% enterprises	2020	2020	2020	2020	
3c1 SMEs selling online	NA	19%	17%	19%	
% SMEs	2020	2021	2022	2022	
3c2 e-Commerce turnover	NA	5%	7%	11%	
% SME turnover	2020	2021	2022	2022	
3c3 Selling online cross-border	4%	7%	7%	9%	
% SMEs	2019	2021	2021	2021	

Source: Digital Decade Country Report 2023 - Greece

Main barriers of digital transformation of SMEs:

All three countries report similar barriers of digital transformation for SMEs as follows:

- Insufficient digital skills and know-how across the workforce. The digital skills of employees and managers are often insufficient to effectively use technologies.
- There is a lack of IT professionals, especially among SMEs.
- High costs of digital tools and services: small and medium-sized enterprises often do not have sufficient capital to finance ICT equipment, software, or training.
- Most SMEs do not perceive the benefits of digitalization or do not consider it urgent.
- Lack of digital culture and internal resistance to change among business owners and staff
- Regulation related to digital services is sometimes outdated or too complex (e.g. e-signature, GDPR, e- invoice).
- Public procurement and tendering systems often not encourage digital innovation.
- Limited access to tailored advisory support: companies experienced in digitalization rarely mentor smaller businesses, there is some kind of lack of digital ecosystem.
- Low uptake of technologies like cloud computing, big data, and AI

- Regional inequalities; limited infrastructure in rural areas affecting digital access

National policies and initiatives supporting SMEs' digitalization:

HUNGARY

Between 2014-2020 the **Economic Development and Innovation Operational Programme** co-financed by the EU (European Regional Development Fund and European Social Fund) focused on the stimulation of the economies of the less developed regions in **Hungary**. Its most important priorities were the competitiveness of small-and medium sized enterprises, innovation and information and communication technologies.

The **Modern Enterprises Programme**, managed by the Hungarian Chamber of Commerce and Industry and co- financed by the EU (European Regional Development Fund (ERDF)) has been Hungary's key instrument for fostering digital developments in the SME sector since 2015. Under the programme, 14 801 company audits were implemented, 8 373 companies obtained the 'Digitally Qualified Enterprise' classification, 295 events were organised, and 1 093 IT suppliers developed over 3 150 products and services by January 2022.

Between 2021 and 2027 the **Digital Renewal Operational Program Plus** (DIMOP Plusz) is Hungary's comprehensive digital transformation initiative. It aims to enhance the country's digital preparedness and competitiveness by addressing global technological, security, and sustainability challenges through an integrated approach. The total budget of approximately 787.74 billion HUF, with 80% co-financed by the European Regional Development Fund (ERDF) and the European Social Fund Plus (ESF+).

Additionally, there are many private initiatives to support SMEs' digital transformation (e.g. occasional workshops, trainings conferences on different topics /AI, social media, SAP, graphics, design, database management, digital marketing etc.).

BULGARIA

In **Bulgaria**, government-supported initiatives such as the **Operational Programme "Innovation and Competitiveness"** and the **Innovation Strategy for Smart Specialisation (IS3)** have introduced financial incentives for SMEs to invest in digital solutions. However, implementation remains uneven, with rural and underdeveloped regions often underserved due to administrative burdens and lack of support intermediaries.

While national policies align with EU priorities—particularly the **Digital Europe Programme**—there is a pressing need to strengthen monitoring mechanisms, build intermediary support networks, and provide localized training and mentoring. Stakeholder collaboration between businesses, education

providers, and local authorities will be essential to close the digital gap and ensure sustainable transformation at scale.

GREECE

To accelerate digital adoption, **Greece** has introduced targeted initiatives for SMEs, often supported by EU funding. A cornerstone program is the *"Digital Transformation of SMEs"* initiative under the National Recovery and Resilience Plan (RRP) *Greece 2.0*. Within this, **Program I "Digital Tools for SMEs"** provides direct subsidies (vouchers) for small businesses to acquire new digital products and services. In its first cycle (2022–2023), thousands of SMEs received vouchers to invest in tools like e-commerce platforms, cloud software, and cybersecurity solutions. Building on its success, a second cycle was launched in late 2024 with a budget of €42 million, funded by NextGenerationEU, to further *"support SMEs in their digital modernization and upgrading"*. Through this voucher scheme, even very small firms can offset the cost of essential technologies, improving their digital maturity.

Another RRP-backed measure, *Program II "Digital Transformation of SMEs"*, offers larger grants for more advanced digitalization projects (e.g. developing digital products or services). These efforts align with Greece's RRP Component 2.3, which allocates €375 million specifically to the digitalization of businesses. Beyond the RRP, Greece's Partnership Agreement 2021–2027 (ESPA) also dedicates resources to SME digital advancement. For example, the national Operational Program "Digital Transformation 2021–2027" earmarks €113 million solely for enhancing digital skills in the workforce, recognizing that upskilling is critical for technology uptake. In addition, industry-led initiatives are contributing to SME digitalization: major tech companies have invested in digital hubs and training (e.g. Microsoft's plan to train 100,000 Greeks in digital skills by 2025, and chambers of commerce provide consulting on digital strategies for local businesses.

Overall, Greece's digital transformation landscape is characterized by high-level policy commitment, significant EU financial support, and a flurry of programs aiming to close the digital gap for SMEs. The coming years will be pivotal in translating these initiatives into measurable increases in SME digital adoption on the ground.

Section 3: Digital Skills for VET Trainers and Students

The key digital skills required in today's job market:

Skill	Description	DigComp Category	Use in business (e.g.)	VET relevance
Information search and evaluation	Effectively finding, comparing, and evaluating digital information	1 – Information and data literacy	Market research Competitor analysis	Core competence
Cloud-based collaboration	Co-editing documents, using online communication tools	2 – Communication and collaboration	Project management e.g. in MS Teams, Document sharing and co- editing via OneDrive etc.	Group projects in different subjects, online collaboration work
Digital content creation	Creating and editing text, images, video, presentations	3 – Digital content creation	Marketing Campaigns Newsletters	Creating visual materials with Canva, PowerPoint in order to present something
Cybersecurity and data protection	Protecting data, password management, GDPR compliance	4 – Safety	GDPR compliance data leak prevention	Education needed in the framework of digital culture subject
Digital problem solving	Selecting and using digital tools to solve problems	5 – Problem solving	Automating processes in excel troubleshooting	VET fieldwork
Digital marketing and communication	Managing social media, SEO, email marketing	3 – Digital content creation	Managing social media SEO Email marketing	in case of professions in need of online promotion
Automation	Creating and operating automating workflows	5 – Problem solving	Automating customer service processes	Education needed in the framework of digital culture subject (not profession related but general)
CAD/CAM software usage	Applying digital design and manufacturing tools	3 – Digital content creation	e.g. Dental prosthetics design (CAD)	Profession related education
Use of artificial intelligence	Understanding and responsible use of AI tools	5 – Problem solving 1 – Information and data literacy	Chatbots AI-driven marketing automation	Education needed in the framework of digital culture subject

Digital skills prioritized in the national VET curriculum:

The development and integration of digital competencies into vocational education and training (VET) systems have become a strategic priority in Hungary, Bulgaria, and Greece, reflecting a shared recognition that digital skills are essential for preparing students for contemporary and future labour markets. All three countries have adopted or aligned their VET curricula with the European Commission's Digital Competence Framework for Citizens (DigComp), emphasizing core digital competencies such as information and data literacy, communication and collaboration, content creation, safety, and problem-solving.

In **Hungary**, the *National Core Curriculum*, which is mandatory for all educational institutions, explicitly incorporates digital competence development based on DigComp, particularly at level 3 of the framework. It outlines specific expectations for students, such as the ability to evaluate reliable information online, use digital communication tools effectively, create and edit digital content, understand cybersecurity fundamentals, and solve problems using digital technologies. Importantly, Hungary's approach also acknowledges the need for profession-specific digital skills, allowing VET institutions to adapt and specialize their curricula to match occupational needs. This alignment ensures a basic level of digital literacy while providing flexibility to meet diverse sectoral demands.

Bulgaria, similarly, has formally adopted the DigComp and DigCompEdu frameworks as part of its broader VET reform agenda. These frameworks guide the structuring of digital skills development across both student and educator profiles. Key competencies include basic digital literacy, safe internet use, digital communication and collaboration, data handling, and content creation. Students are introduced to tools like office software, cloud platforms, and basic coding environments. Sector-specific applications, such as CAD in engineering or digital marketing tools in business, are also emphasized. The curriculum promotes ethical technology use and cybersecurity awareness. Supported by EU and national funding, VET schools are upgrading infrastructure and training teachers, though implementation varies regionally.

Ensuring that vocational education and training (VET) students acquire relevant digital competences has become a focus in Greece's educational strategy. Digital skills are increasingly recognized as core competencies alongside traditional technical skills. In recent reforms, the national VET curriculum has begun to integrate ICT literacy, digital tools usage, and basic computer science concepts into both general subjects and vocational specializations. For instance, many VET schools (EPAL – vocational upper secondary schools) now include modules on office productivity software, computer-aided design for technical fields, and digital safety as part of their programs. Moreover, Greece is aligning with European frameworks to structure these competencies: the country officially adopted the European DigComp (Digital Competence Framework for Citizens) by translating the latest DigComp 2.2 framework into Greek in 2023. This translation, led by the Secretariat-General for Digital Governance as part of the National Alliance for Digital Skills, provides a common reference for defining digital skills at various proficiency levels in education and training. Although aimed at citizens broadly, the adoption of DigComp is influencing VET curricula by highlighting key areas (information literacy, communication, content creation, safety, problem-solving) that students should master. Similarly, for educators, Greece is aware of the DigCompEdu framework (for digital

competence of educators) and has taken initial steps to sensitize VET trainers to these standards, though a formal nationwide adoption of DigCompEdu is still in progress. In summary, the national VET system is prioritizing foundational digital skills and gradually embedding EU-aligned digital competence standards, reflecting the understanding that today's VET graduates must be prepared for technology-rich workplaces.

Across the three countries, a **common foundation** is visible: all are committed to embedding digital competencies in VET systems through alignment with EU frameworks like DigComp and DigCompEdu. They emphasize the same core areas - information literacy, communication, content creation, safety, and problem-solving - and recognize the role of VET in closing digital skill gaps. However, differences emerge in the depth and pace of implementation. Hungary has a more structured and centralized approach, offering clear curriculum adaptations for different professions. Bulgaria, while aligned in policy, faces pronounced disparities in infrastructure and teacher preparedness that hinder consistent implementation. Greece is taking a more gradual and modular path, actively embedding EU-aligned standards and tools into vocational programs while building awareness among educators.

In conclusion, while Hungary, Bulgaria, and Greece are all working toward equipping their VET students with essential digital skills, their current progress reflects varying degrees of systemic readiness, institutional support, and investment. Ensuring equitable access to digital tools, empowering educators through professional development, and fostering practical, real-world application of digital competencies will be crucial for all three countries to fully realize the potential of digital transformation in vocational education.

State of Readiness of VET Systems in Hungary, Bulgaria, and Greece for Digital Transformation

The vocational education and training (VET) systems of Hungary, Bulgaria, and Greece are undergoing significant reform efforts to align with the accelerating pace of digital transformation. All three countries acknowledge the growing importance of digital skills for employability and competitiveness and have formally adopted or are aligning their curricula with the European DigComp and DigCompEdu frameworks. However, their readiness levels differ substantially due to disparities in infrastructure, institutional capacity, and implementation progress.

In **Hungary**, while national strategic documents such as the National Core Curriculum and the VET 4.0 Strategy formally integrate digital competencies into vocational training, practical implementation faces considerable obstacles. VET students in Hungary perform below the European average in digital literacy, particularly in application knowledge and problem-solving. Key skill gaps include information and data management, digital security, and the ability to use digital tools for innovation. Although some professional pathways, notably in the automotive industry, have embedded relevant digital content, most framework curricula do not reflect the digital demands of the labour market. Furthermore, many Hungarian VET institutions suffer from outdated equipment, insufficient internet bandwidth, inadequate Wi-Fi coverage, and a lack of modern digital teaching

tools. The challenges are compounded by a shortage of digitally competent subject-specific trainers and a lack of pedagogical-methodological preparation to support digital learning environments.

Bulgaria presents a similarly complex picture. While it has formally integrated EU frameworks into its VET policies, the implementation remains inconsistent, especially across urban-rural divides. The majority of VET trainers recognize the importance of digital teaching, yet only a small fraction feel adequately prepared to apply digital methods. Infrastructural limitations, inflexible curricula, limited peer exchange and support networks, and a lack of structured professional development hinder the effective use of digital tools in the classroom. VET students are generally enthusiastic about digital technologies, especially in areas like multimedia content creation and communication. However, their skills are often limited to surface-level tasks, with advanced competences such as cybersecurity awareness, data analysis, and collaborative software use being underdeveloped. Initiatives like the National Programme for IT Careers have sought to promote coding and digital entrepreneurship, but they typically target general education rather than vocational pathways. To improve the system's readiness, Bulgaria requires more investment in teacher training, access to modern equipment, and stronger collaboration between VET institutions and industry to ensure curriculum relevance.

In **Greece**, digital transformation in VET has gained momentum in recent years through curricular updates and national strategies aimed at embedding digital competences. The translation and national adoption of DigComp 2.2 provide a formal foundation for structuring digital learning outcomes. Greek VET students, particularly in ICT and engineering tracks, often graduate with solid applied skills in software or hardware relevant to their field. However, in non-technical areas, students frequently lack exposure to higher-order digital competences like coding, data analytics, or adaptability to new business software. A longstanding issue has been the under-resourced infrastructure in many schools, especially in rural regions. Although recent investments are beginning to modernize equipment and connectivity, many learners still rely on personal devices or informal learning to develop their digital capabilities. Greek VET trainers also exhibit a wide range of digital readiness levels. While a younger cohort is more comfortable with technology, many veteran educators have limited digital pedagogical experience. National responses include EU-supported professional development programs and a dedicated "train-the-trainer" initiative under the 2022–2024 strategic plan. However, the overall number of certified digital teaching professionals remains insufficient. An additional challenge lies in the slow institutionalization of frameworks like DigCompEdu into teacher certification and professional standards. While Greece has made progress in aligning with EU benchmarks, it still lags in fully embedding digital skills in both teaching and credentialing processes.

Challenges in integrating digital skills into VET training:

Across all three countries, several **shared challenges** emerge: limited access to digital infrastructure and modern teaching tools, uneven digital competence among educators, gaps between labour market needs and curriculum content, and the absence of widespread, practical training

opportunities for students. These issues are particularly acute in rural or underfunded regions, where digital readiness is significantly lower.

At the same time, there are **distinctive approaches**. Hungary offers clear national strategies and formal curricular space for profession-specific digital content, but faces systemic infrastructural limitations. Bulgaria shows policy alignment but suffers from weak institutional capacity and low trainer confidence. Greece demonstrates strong momentum in policy reform and international collaboration, yet still grapples with implementation gaps, especially in non-specialized tracks and teacher certification.

In conclusion, while Hungary, Bulgaria, and Greece have recognized digital skills as a cornerstone of VET modernization and have made important steps toward aligning with EU frameworks, their VET systems remain in transition. Bridging the gap between policy and practice will require sustained investment, institutional reforms, and more inclusive access to digital tools and training—particularly for educators and learners in underserved areas. Only by addressing these structural and pedagogical challenges can the VET systems in these countries become fully equipped to prepare students for the demands of a digitally transformed labor market.

Section 4: Training Approaches for Digital Transformation in VET

Across Hungary, Bulgaria, and Greece, Vocational Education and Training (VET) systems are increasingly integrating digital skills into their curricula, driven by national strategies and EU-level frameworks such as **DigComp**. While each country shows specific features in terms of implementation, several **core methodologies** are widely adopted and **common challenges** are raising.

HUNGARY

In Hungary, digital skills training in vocational education and training (VET) is primarily delivered through the **Digital Culture** subject, introduced in 2020. This subject promotes not just technical proficiency, but also critical and creative use of digital technologies in real-life contexts. Common methods include real-world application of digital tools (e.g., spreadsheets), group and project-based learning, interactive digital platforms (such as Canva, Kahoot, and virtual reality tools), e-learning systems (e.g., Moodle), and gamification strategies to enhance engagement.

Several national initiatives support the transition toward a digitally competent VET system. One example is the **Digital Community Creative Workshops (DCCWs)**, established in 63 centres by 2021. These multifunctional spaces allow students to explore robotics, programming, smart home

technologies, and digital media creation. They are open not only to students but also to local businesses and higher education institutions.

Another major initiative is the **Digital Theme Week**, launched in 2016. It engages more than 130,000 students annually and encourages digital citizenship, algorithmic thinking, and responsible use of AI. A good practice within this initiative includes dental technician training where students use CAD design software for practical assignments and create digital knowledge resources.

The **Digital Curricula Development and IT Training** project (2017–2022), part of Hungary's GINOP programme, created over 226 digital learning contents for VET and set digital competence levels for all recognized occupations. It is complemented by the **VET 4.0 Strategy**, which aims to integrate digital tools across all subjects and provide infrastructure such as superfast internet, Wi-Fi, smart boards, tablets, and profession-specific software to 381 vocational schools.

Despite progress, challenges remain. These include a limited number of digital-focused classes, outdated infrastructure, lack of teacher motivation and digital competence, insufficient Wi-Fi coverage, and inadequate pedagogical-methodological support for digital environments.

Industry collaboration in digital VET remains limited. Few vocational teachers have industry experience, and only a small proportion engage in factory visits. However, the VET 4.0 Strategy recognizes the importance of in-company training for VET teachers, setting a target of 1,000 such trainings. Legislative and financial solutions are still needed to make these collaborations viable.

Overall, Hungary is taking structured steps to modernize its VET system and align it with the needs of the digital economy, although implementation gaps persist at the school and teacher levels.

BULGARIA

Training approaches in Bulgaria's VET system are gradually evolving to reflect the growing importance of digital skills in the labour market. Most VET institutions now integrate **blended learning models**, combining in-person sessions with online materials. While promising in theory, the actual use of innovative digital training methods varies significantly by region and school capacity. Successful examples include EU-funded projects like **"Digital VET"**, which has piloted modular courses using cloud platforms, simulation environments, and real-time collaboration tools. Another promising initiative is the **"Digital Leaders Academy"**, which supports trainers through intensive workshops, peer learning, and access to curated digital resources. These programs have demonstrated measurable improvements in trainer confidence and student engagement.
However, **scaling these models remains a challenge**. Barriers include:
- Outdated hardware and software in schools;
- Lack of instructional design skills among educators;

- Minimal incentives for VET institutions to innovate.

Industry partnerships are proving valuable in bridging these gaps. Some schools collaborate with local tech companies or chambers of commerce to deliver **customized digital training**. This often takes the form of short-term bootcamps, internship-based learning, or project-based collaborations. An emerging trend is the use of **simulation-based learning**, particularly in technical fields like automotive mechanics, electronics, and mechatronics. These tools allow students to safely experiment with digital systems and problem-solving in a risk-free environment. However, adoption is still in its infancy, and many VET instructors remain unfamiliar with these platforms.

Key opportunities for enhancing training approaches include:

- Expanding access to affordable EdTech tools tailored for VET;
- Embedding digital literacy objectives into sector-specific modules;
- Providing incentives for trainers to experiment with new pedagogies.

To ensure that all students benefit equally, **national coordination mechanisms** should promote good practice exchange and support training institutions in under-resourced areas. Ultimately, the effectiveness of any training approach depends not only on the tools used, but on how they are embedded in a **coherent, learner-centered, and labor market-relevant strategy**.

GREECE

Greek Vocational Education and Training (VET) institutions are increasingly adopting diverse methodologies to build digital skills, combining traditional instruction with innovative tools. **Blended learning**—mixing face-to-face and online activities—has become a widespread approach, especially following the pandemic, with platforms like **Moodle** and **e-class** now standard in many schools. These platforms are used to complement practical training through videos, online modules, and assignments. **E-learning** is particularly strong in adult and continuing VET, although fully online programs remain limited due to the need for hands-on experience.

Simulation-based training is gaining ground, especially in technical fields such as electrical engineering and manufacturing, where students can practice using virtual labs or CNC machining simulators. **Project-based learning** is also emphasized, with students developing digital portfolios, websites, or CAD designs as part of capstone projects.

Strong **industry partnerships** further enrich digital VET. Companies like Microsoft, IBM, and Google collaborate with VET schools to deliver workshops, certifications, and digital bootcamps. Tourism and IT VET programs often engage local businesses for training in sector-specific tools. These partnerships help align curricula with market needs.

National initiatives support this transformation. A **Digital Platform for VET** is being developed as part of Greece's 2022–2024 strategy, including a governance portal and a distance education system offering modular content to students and teachers. The government is also upgrading equipment in 117 vocational lab centres using EU recovery funds—installing smart boards, robotics kits, and diagnostics tools. The **Digital School platform**, piloted in 2024, offers remote tutoring and hybrid classes to VET students in remote regions, addressing geographic disparities.

Pilot programs like regional makerspaces and EU-funded projects (e.g., VR training for electricians) complement national efforts, while participation in tools like **SELFIE** has helped VET schools develop tailored digital action plans. Success stories include AR use in agriculture training and the creation of 200+ digital lessons by a vocational school in Athens.

Despite these advances, barriers persist. These include gaps in teacher digital training, outdated infrastructure in rural schools, resistance to change, and uneven student preparedness. Bureaucratic delays and patchy internet access also hinder progress. To address this, the government is investing in both infrastructure and capacity building, aiming to scale up successful pilots into national practice. Overall, Greek VET is transitioning toward a more interactive, industry-connected, and technology-rich learning environment.

Conclusions

The integration of digital skills into Vocational Education and Training (VET) systems in Hungary, Bulgaria, and Greece reflects a shared understanding of the urgency to modernize education in line with the demands of the digital economy. While each country is progressing at a different pace and through distinct strategic approaches, common trends, opportunities, and challenges are clearly emerging.

All three countries have embraced blended learning as a core methodology, leveraging digital platforms such as Moodle, e-Class, and cloud-based tools to support face-to-face instruction and expand access to flexible learning resources. Project-based learning**,** simulation environments, and gamification are increasingly used to make digital education more relevant and engaging, particularly in technical fields such as engineering, manufacturing, and design.

National initiatives in each country have been instrumental in driving systemic change. Hungary's **Digital Theme Week**, **Digital Community Creative Workshops**, and **VET 4.0 Strategy** represent a structured and ambitious effort to embed digital competence across subjects and infrastructure. Bulgaria's participation in EU-funded programs like **Digital VET** and the **Digital Leaders Academy** highlights its growing focus on teacher training and modular, real-world digital learning. In Greece, the rollout of a comprehensive **Digital Platform for VET**, investments in **lab infrastructure**, and pilots like the **Digital School** signal a strong national commitment to equitable and modern digital education.

Despite these advances, **several barriers** are shared across countries. These include outdated digital infrastructure in schools, uneven internet access, a lack of pedagogical and technical skills among educators, limited in-company training opportunities for teachers, and resistance to educational change. In all three cases, industry collaboration is recognized as essential but still underdeveloped, particularly in engaging small and medium-sized enterprises (SMEs) and aligning curricula with real-world digital tools.

To move forward, these VET systems must build on their pilot successes and scale proven practices nationally. This requires continued investment in infrastructure, capacity-building for teachers, stronger incentives for innovation, and the formalization of partnerships with the private sector. National coordination mechanisms should also ensure that under-resourced regions and schools are not left behind in the digital transition.

Ultimately, the effectiveness of digital skills training in VET lies not only in the availability of technology but in how well it is integrated into learner-centered, labour market-relevant strategies that prepare students for an increasingly digital and interconnected world.

Section 5: National Policies & EU Support for Digital Transformation

Hungary, Bulgaria, and Greece have each developed distinct but complementary strategies to advance the digital transformation of small and medium-sized enterprises (SMEs) and vocational education and training (VET), aligning with broader European Union (EU) priorities. While all three countries emphasize policy coherence, EU alignment, and investment in digital skills, they differ in implementation success, systemic readiness, and regional reach.

Government policies and strategies to support SME digitalization:

<u>HUNGARY</u>

The Modern Enterprises Programme (MVP) is a major government initiative coordinated by the Hungarian Chamber of Commerce and Industry. Its first phase was launched on 1 September 2015 and aimed to help Hungarian SMEs to digitally catch up, so that they can more effectively adapt to the challenges of the digital economy. The MVP specifically focused on investing in digital assets for businesses, especially in rural and less digitized areas. The main goals of the programme are as follows:

- easier access to digital tools and services;
- providing various consulting services and training to deepen digital knowledge;
- providing the opportunity to create digital development concept tailored to specific SME

that helps identify the most important technological innovations that can increase the efficiency and competitiveness of the SME.

As a result, more than 25,000 business benefited from the digital development services provided by the programme, creating a completely new digital ecosystem in Hungary.

After the successful first phase, the government launched *the Modern Enterprises Programme 2.0 (MVP 2.0)* in October 2024 and running until December 2026, which builds on the achievements of the previous phase and provides even more opportunities for digital development of businesses. In the framework of MVP 2.0 100% non-refundable grants are also available, which are aimed at developing digital tools and systems, strengthening online presence, and digitizing businesses. Additionally, in the MVP 2.0 there is even greater emphasis on creating digital development concept tailored to specific SME.

Altogether, the MVP 2.0 aims to reach more than 10,000 SMEs and to prepare digital development concepts for 5,000 SMEs.

Relevant national strategies enhancing the digital transformation process are:

- National Digitalisation Strategy 2022-2030
- Artificial Intelligence Strategy of Hungary 2020-2030
- SME Strategy 2019-2030
- Hungary's digital startup strategy (2016)

BULGARIA

Bulgaria supports SME digitalization through a coordinated suite of strategies and programs aimed at enhancing innovation, connectivity, and digital skills. The *Innovation Strategy for Smart Specialisation (IS3)* drives applied R&D and technology adoption in key sectors, creating a strong innovation environment for SMEs. This is complemented by the *National Development Programme Bulgaria 2030*, which prioritizes digital connectivity—especially broadband and 5G—to ensure SMEs across the country can access modern digital tools. Simultaneously, the *National Recovery and Resilience Plan (NRRP)* allocates funds to bolster digital education infrastructure, workforce upskilling, and community-based digital initiatives. These national efforts are supported by EU programs like *Digital Europe*, *Erasmus+*, and the *Human Resources Development Operational Programme (ESF+)*, which provide targeted vocational training, SME-focused ICT support, and lifelong learning opportunities. By aligning strategic planning, research-driven innovation, and EU funding, Bulgaria is creating an enabling environment for SMEs to digitize and compete effectively—though success depends on reducing administrative hurdles and expanding regional outreach.

GREECE

Greece's government has articulated clear policies to drive digital transformation, especially for SMEs. The overarching policy document is the *National Digital Transformation Strategy 2020–2025*, which, as noted, is nicknamed the *Digital Transformation "Bible"*. This strategy lays out the government's commitment to digitize public services, promote private sector innovation, and develop digital skills across society. Within this framework, there are sub-strategies targeting specific areas. For SMEs, Greece adopted a *National Digitalisation Strategy for Businesses* aligned with the EU's Digital Decade targets. The strategy envisions raising the percentage of SMEs with at least basic digital intensity to 90% by 2030 (from 39% in 2022). Key government measures include simplifying regulations for digital business (e.g. enabling fully online business registrations via gov.gr) and incentivizing technology adoption. *Law 4965/2022*, for instance, introduced tax incentives for SMEs investing in digital equipment and training. Another policy pillar is the improvement of connectivity (so that even rural SMEs can leverage digital tools): Greece's *Ultra-Fast Broadband project* and *5G spectrum rollout* contribute to this. The government also launched the *"National Alliance for Digital Skills and Jobs",* a coalition bringing together ministries, tech companies, and educational institutions to coordinate digital upskilling efforts for the workforce. In the VET sector, the *Strategic Plan for Vocational Education, Training, Lifelong Learning and Youth 2022–2024* explicitly sets the digital transformation of VET and LLL as a main objective. This plan aligns national VET reforms with European initiatives like the Osnabrück Declaration (2020), committing to modernize VET through digitalization. Policies under this plan range from updating VET curricula to include digital competencies, to establishing the digital platform and infrastructure upgrades mentioned earlier. In summary, Greek national policy provides a strong strategic direction and a suite of reforms aimed at embedding digital transformation in both the economy at large and the VET system specifically. The challenge ahead lies in effective implementation, ensuring these well-crafted strategies lead to tangible improvements on the ground.

Funding Mechanisms and Programs for Digital Upskilling:

HUNGARY

Hungary offers a multi-layered funding framework for digital upskilling, drawing on both national and EU resources. A central pillar is the *Recovery and Resilience Facility (RRF)*, which allocates nearly 30% of its €5.8 billion budget—about €1.7 billion—to education and workforce digitalization initiatives, including VET infrastructure upgrades, development of digital curricula, and distribution of digital devices to students and teachers. Complementing this, the *Digital Renewal Operational Programme Plus (DIMOP Plusz)*, backed by ESF+ and ERDF, channels over €2 billion toward enterprise digital innovation, public service digitalization, broadband expansion, and adult digital skills development. Strategic *ESF+ programmes* - notably the Human Resources Development,

Economic Development and Innovation, and Digital Renewal Ops - support comprehensive upskilling, teacher development, VET modernization, and socially inclusive training. Hungary also emphasizes workforce readiness through its *Digital Workforce Programme*, which aims to train at least 20,000 IT professionals via short-cycle and upskilling courses, and integrates with the Digital Success and Digital Education programmes. Finally, the *Modern Enterprises Programme (MVP) -* though not exclusively focused on VET - provides consulting and expert support to SMEs for digital adoption and helps them access EU funding. The *Erasmus+* programme also supports the development of digital skills of VET learners and teachers, for example through study trips abroad, internships and digital curriculum development. This layered ecosystem ensures that both individuals and businesses have access to sophisticated digital training and support, fostering a digitally agile workforce across Hungary.

BULGARIA

In Bulgaria, digital upskilling is supported through a mix of national initiatives and EU-funded programs aimed at enhancing digital competencies across all sectors. A major funding source is the *National Recovery and Resilience Plan (NRRP)*, which allocates approximately €1.6 billion for digital transformation, including the development of training platforms, digital learning communities, and modernized VET infrastructure. The *Operational Programme Human Resources Development (2021–2027)*, funded by ESF+, focuses on lifelong learning and digital inclusion, targeting both employed and unemployed individuals, especially from vulnerable groups. *Erasmus+* also plays a key role by supporting the mobility of VET learners and staff, as well as cross-border collaboration in developing digital curricula and teaching tools. Bulgaria is also part of the *Digital Europe Programme*, which has funded several *European Digital Innovation Hubs (EDIHs)* that offer training, technological testing, and guidance to SMEs and public institutions in areas such as AI, cybersecurity, and cloud computing. Further financial support for SME digital transformation comes from the *Operational Programme Competitiveness and Innovation in Enterprises*, which funds ICT equipment and digital integration. Complementing these are national initiatives like *Digital Bulgaria 2025*, which focuses on improving ICT education and public sector training, and the *Innovation Strategy for Smart Specialisation (IS3)*, which promotes digital R&D in strategic sectors. While these mechanisms provide strong support for digital upskilling, ensuring accessibility - particularly for SMEs and rural communities - remains a critical challenge.

GREECE

Greece is leveraging multiple funding sources to support digital skills development and SME digitalization, with significant backing from the European Union. Foremost among these is the

National Recovery and Resilience Plan (RRP) "Greece 2.0", which dedicates substantial resources to digital transformation. Under Pillar 2: Digital Transformation, the RRP allocates about €2.1 billion (2021–2026) for digital projects. This includes investments in e-government and connectivity, but importantly €375 million is ring-fenced for the Digitalisation of Businesses (with a focus on SME support). Additionally, under Pillar 3: Employment, Skills, Social Cohesion, the RRP provides about €2.3 billion for education, vocational training and skills programs, which covers modernization of VET and training in digital skills for various groups. Specific RRP-funded programs already discussed – such as the *Digital Tools for SMEs voucher scheme*, the *Digital School platform*, and *lab upgrades* – are financed through these allocations.

Aside from the RRP, the *Partnership Agreement 2021–2027 (EU Structural Funds/ESF+ and ERDF)* is a major funding mechanism. For example, the *ESF+-funded Human Resources Development Program* supports continuous vocational training in digital skills for employees and unemployed people, while the *ERDF* backs innovation and digitalization projects in enterprises. As noted, the Digital Transformation OP earmarks €113 million specifically for digital skills training initiatives. There are also national budget contributions and public-private funds: the Greek state co-finances programs like subsidized ICT training for SMEs and has set aside resources for teacher training workshops in digital education.

Crucially, Greece benefits from direct support under EU programs. The *Digital Europe Programme (DEP)* is one, focusing on building Europe's digital capacity. Through DEP, Greece has established several European *Digital Innovation Hubs (EDIHs)*, which are co-funded centers that help SMEs and public actors test and adopt advanced technologies. There are 4 EDIHs in Greece selected for EU funding (and additional hubs with a Seal of Excellence supported nationally). These hubs (such as Smart Attica, digiGOV-innoHUB, Health Hub, etc.) act as one-stop shops where SMEs can get training, technical expertise, and even funding advice on AI, HPC, cybersecurity and other advanced tech, thereby directly contributing to SME digital upskilling. The EDIHs are 50% funded by the Digital Europe Programme and 50% by national/regional funds, exemplifying EU-Greece collaboration. Another key EU instrument is *Erasmus+*, which Greece utilizes to bolster digital competencies in VET. Erasmus+ provides opportunities for VET learners and staff to participate in digital skills projects and exchanges. Greek VET schools have taken part in Erasmus+ projects focused on topics like virtual training internships and digital assessment methods, bringing back innovative practices to the country. Additionally, the Erasmus+ Teacher Academies and the new Vocational Excellence Centres often include digital skill components which Greek institutions join.

HUNGARY

Hungary's well-structured digital transformation agenda shows strong strategic alignment with EU policy, but key gaps and challenges in implementation, particularly for SMEs and VET institutions, remain evident.

1. Regional and demographic disparities. Hungary's broadband infrastructure is robust- 84.1% of households have access to very high-capacity networks (VHCN), and 76.2% have fiber to the premises, both above EU averages. Still, rural regions lag significantly: broadband penetration in the Northern Great Plain, for instance, is about 10 percentage points lower than in Budapest (98% coverage). Less than a quarter of rural residents have more than basic digital skills, underscoring a persistent urban-rural divide.

2. SME digital maturity gap. While 57.4% of Hungarian SMEs have achieved basic digital intensity, this is well below the EU average of 72.9%. Even more advanced technologies lag: only 3.7% of Hungarian SMEs use AI, compared to 13.5% across the EU. Similarly, ERP system usage and social media presence remain below EU averages (35% vs. 43%, and 17% vs. 32%, respectively).

3. Workforce digital skills deficits. Approximately 58.9% of adults possess basic digital skills, slightly higher than the EU average (55.6%), but still far from the 2030 EU target of 80%. Hungary also trails in ICT specialist employment (4.2% vs. 4.8% EU avg), reflecting underwhelming progress in building a digitally skilled workforce. Moreover, skill gaps are larger among older and less-educated populations, as well as rural communities.

4. Fragmented implementation and governance. Despite a digital roadmap of 44 measures and significant funding (€4.3 billion across RRF and cohesion funds), policy execution remains inconsistent. Multiple ministries and agencies oversee overlapping initiatives, creating coordination challenges. Digital infrastructure improvements and VET modernization are often delayed by administrative burdens and uneven resource distribution.

5. Monitoring and adjustment. Hungary has adopted KPI-driven digital strategies and an SME self-assessment tool to track progress. However, persistent shortfalls in SME digital intensity and workforce skills suggest more agile implementation, responsive evaluation, and targeted, region-sensitive interventions are necessary.

While Hungary's digital transformation policies are ambitious, well-funded, and EU-aligned, further efforts must ensure inclusive access, incentivize advanced technology uptake among SMEs, rebalance regional disparities, simplify implementation, and refine monitoring mechanisms to translate strategy into tangible, nationwide digital progress.

BULGARIA

Bulgaria has established a comprehensive digital transformation framework aligned with EU strategies and supported by substantial funding. However, despite the abundance of frameworks, **several systemic issues persist**:

- Overlapping policy mandates create confusion among implementers;

- Monitoring and evaluation tools are weak or underutilized;

- Public-private collaboration is often ad hoc and limited to major cities.

Stakeholders report that funding calls are too bureaucratic and inaccessible for many SMEs and smaller VET providers. There is also a lack of **localized support structures**, such as digital skills hubs or regional coordinators.

Some positive examples include the use of EU Structural Funds to modernize VET school infrastructure and introduce coding classes at the secondary level. However, these efforts often remain **isolated pilots** without a long-term sustainability plan.

To address these gaps, national authorities should:

- Simplify access to digital support schemes;

- Promote integration between policy levels (national, regional, EU);

- Establish a unified platform for digital skills development across education and business sectors.

Coherent, well-implemented policies, backed by strong coordination and stakeholder engagement, are essential for turning Bulgaria's digital ambition into practical outcomes.

GREECE:

While Greece has robust strategies and significant funding in place, the translation of policy objectives into on-the-ground impact is an ongoing challenge. One observed gap is between the ambitious national targets and current implementation pace. For instance, policies call for 70% of the population to have basic digital skills by 2025, yet actual numbers are only around 51% presently – reaching the target will require not just funding but effective outreach and training delivery to a broad segment of society, including older workers and small business owners who are often hard to engage. Similarly, despite the Digital Transformation Bible's hundreds of projects, many are in progress but not yet completed; SMEs and schools may not feel the full benefit until these projects mature. There is also a complexity in coordination: multiple ministries (Digital Governance, Education, Labor) and stakeholders are involved, which sometimes leads to fragmented efforts. For example, SME digitalization programs (run by the Digital Governance

Ministry) and VET upskilling programs (run by Education/Labor ministries) need to sync their efforts so that SMEs actually employ newly digitally skilled VET graduates – a linkage that is still weak.

Another gap is in digital inclusion: while policy addresses general goals, certain groups (micro-enterprises, rural communities, older trainers) might be left behind. The government's own analysis acknowledges that the distribution of Greek enterprises (many micros, as noted) and regional disparities can affect digital transformation outcomes. Thus, ensuring that policy initiatives reach and support these smallest firms and remote VET schools is critical. The implementation of funding is also challenging – absorbing EU funds effectively requires administrative capacity. Greece has improved in this area (especially with the fast deployment of RRF funds), but bureaucratic hurdles can delay project rollouts (e.g., procurement of school equipment or disbursement of SME vouchers can be slow).

Nonetheless, EU monitoring (through DESI and the European Semester reports) indicates Greece is making notable progress, even if starting from a low base. The European Commission's 2023 country report highlighted Greece's advances in connectivity and e-government, and pointed out the RRP's implementation as key to closing the gap in digital skills and SME tech adoption. The alignment with EU programmes ensures Greece is not acting in isolation – knowledge transfer and financial support from the EU level bolster national efforts. As Greece continues to implement its policies, ongoing evaluation and flexibility will be important. The government has built in some monitoring (e.g., the Digital Transformation Bible has KPIs, and the Digital Skills National Alliance tracks progress), which should help identify mid-course corrections needed. In conclusion, Greece's policy landscape for digital transformation is robust and well-aligned with EU priorities; the main task ahead is efficient, inclusive implementation to ensure that SMEs, VET institutions, and individuals on the ground feel the impact of these policies in terms of improved skills and digital opportunities.

Section 6: Case Studies & Best Practices from

HUNGARY

Case study 1 - SME:

Title: The power of digitalization: managing contracts without paper – a case study of SalesAutopilot's electronic contracting processes.

Company and profile: SalesAutopilot Ltd is a cloud-based marketing automation software company.

Industry: information technology and marketing services

Target audience: SalesAutopilot Ltd's staff

Challenges: in 2020 the coronavirus and the home office made them realize that paper-based contract management was no longer sustainable, especially due to the logistical difficulties of postal administration and physical signatures. The documents were generated within the SalesAutopilot system, but were manually printed, signed, and shipped – this became impossible during the home office period.

Solution implemented: the company in cooperation with Wiredsign Plc has fully automated two key areas: employment contracts and reseller agreements. The technology adopted enables partners or employees to start the process using a simple online form. The system automatically generates the contract, notifies the signatory parties, and digitally processes the signature. The office manager and the company manager receive immediate feedback.

Impact & results: the company achieved faster, more transparent, more environmentally friendly, and less error-prone operations.

Key takeaways: this case study is a good example of how a company open to digitalization can turn technology into a strategic advantage that boost its competitiveness.

Reference: https://blog.eszerzodes.hu/a-digitalizacio-hatalma-salesautopilot/

Case study 2 - SME:

Title: The digital transformation of Reálszisztéma Ltd

Company and profile: Reálszisztéma Ltd's core business is the sale of new and used vehicles, along with related maintenance, repair, and inspection services.

Industry: vehicle trade

Target audience: Reálszisztéma Ltd's staff

Challenges: at the beginning of its digitalization efforts, Reálszisztéma Ltd encountered several obstacles – including the limitations of a popular low-code platform – which hindered process development and slowed down project progress. More detailed there were operational challenges: complicated manual processes in parts ordering and vehicle inspection, lack of transparency and traceability in workflows, high error rates and significant administrative burdens, communication difficulties between sites, isolated systems hindering productivity and reporting.

Solution implemented: cooperation with the company Oriana, a Budapest seated company supporting businesses in the digital transformation by providing software solutions, including tackling the automation challenges of the most complex processes. A new low-code platform was introduced at Reálszisztéma Ltd in the following way: the prototype-based agile methodology

enabled rapid iteration and continuous feedback and review. On-site consulting was combined with practical training to facilitate the rapid adoption of the new system. Collaboration took place on a weekly basis through in-person meetings involving representatives of the IT team and functional area experts. These were conducted in a workshop-style format, typically 4-hour sessions held once or twice a week.

Impact & results: simplification and digitalization of existing workflows to improve operational efficiency and reduce errors increasing the transparency and traceability of processes, as well as automating routine tasks, building in-house development capacity, ensuring real-time data access, taking customer experience to a new level, increasing employee productivity and engagement by reducing administrative burdens and strengthening the culture of continuous improvement and innovation.

Key takeaways: one of the project's greatest achievements was that the Reálszisztéma Ltd's IT team learned to use the new system during the implementation phase, becoming capable of digitizing their own processes and taking over the operations. As a result of our collaborative work 14 critical processes were digitalized in just four months. The combination of the agile methodology and on-the-job training enabled early mastery of the system and quick adaptation, thereby building the internal competence needed for the company to strengthen its commitment to continuous improvement and innovation.

Reference: https://veszpremikamara.hu/uploads/documentitem/122/realszisztema-case-study-hun-1747209071.pdf

Case study 3 - SMEs
Title: DIMOP Plusz programme for the digital transition of the SMEs
Institution: Ministry of Energy
Sector: overall business
Target audience: SMEs

Challenges: The majority of Hungarian SMEs lack adequate digital infrastructure, tools, or digital skills, which hinders their competitiveness and development. The digital competencies of the workforce and the entrepreneurial community are not sufficiently advanced, obstructing the effective use and widespread adoption of digital technologies. Due to new technological trends and changes in the global competitive environment, a comprehensive program addressing the challenges of digital transformation is essential.

Solution implemented: Under the DIMOP Plusz program, the Hungarian government launched two grant schemes (from 2024 December) aimed at supporting the digital transformation of Hungarian SMEs. One targets businesses with low digital maturity, while the other is designed for more digitally advanced SMEs.

The main goal in both cases is to increase the digital sophistication of SMEs, thereby strengthening the competitiveness of the economy.

Winning applicants have the opportunity to introduce new digital tools and systems, develop the digital competencies of their staff, and apply efficiency-enhancing technologies (such as cybersecurity tools, firewalls, backup solutions, web development, webshop, digital marketing, e-invoicing, hardware procurement [laptops, tablets, servers, smart devices], consultancy services, AI-based tools, IoT systems, specialized training, etc.).

Additionally, the advantage of the program is that companies can take out loans with 0% interest, and in certain cases, non-refundable grants may also be available.

Impact and results: there is no public data yet available on how many businesses have applied for the DIMOP Plusz loan programs.

Reference: https://www.palyazat.gov.hu/programok/szechenyi-terv-plusz/dimop-plusz

Case study 4 - VET:

Title: The program of the Internet club of the Cegléd Economic and IT Vocational School
VET institution: Cegléd Economic and IT Vocational School
Target audience: 12 VET students aged 16-17 interested in HTML programming and web programming.

Challenges: there is no permanent gallery in Cegléd, so works worthy of an exhibition are presented on the Internet. A lot of old computer equipment was waiting to be presented. After several attempts, a suitable location for the exhibition could not be found, so the club thought of creating a virtual museum. The implementation of this was useful both because of the school's profile and because it allowed students and all to get to know the computer equipment of the 50s, 60s and 70s. The aim of the project was therefore to present the history of computer technology virtually.

Solution implemented: the planned dynamic and interactive website also included photographs of the devices, their brief descriptions and the history of computer technology in Hungary. Pictures of the more interesting devices were taken from several perspectives, allowing to present a 360°view of the objects. The trainer used frontal working method, which was mainly necessary when assigning tasks and explaining working methods, while space was given to individual and group work during the implementation process. In the closing phase of the project, the trainer's coordinating role dominated.

Impact & results: the students participating in the project were able to deepen their knowledge of internet programming and to learn the VRML language to create a dynamic website. Not only students, but anyone else had the opportunity to gain insight into the history of Hungarian

computing by visiting the website. In order to implement the virtual museum, a new tender has been submitted for the purchase of Compaq servers.

Reference: https://folyoiratok.oh.gov.hu/uj-pedagogiai-szemle/esettanulmanyok-az-innovativ-pedagogiai-gyakorlat-bemutatasara

BULGARIA

Case Study 4 – VET

Title: *Equal Access to School Education in Times of Crisis*
Institution: Ministry of Education and Science, Bulgaria
Sector: Vocational and General Education
Target Audience: Students and teachers from disadvantaged communities, including Roma populations

Challenges:
The COVID-19 pandemic caused widespread disruptions to Bulgaria's education system, exposing digital divides and leaving many students without access to online learning. A lack of digital devices, weak internet infrastructure in rural regions, and limited digital skills among both teachers and learners posed significant challenges. Vulnerable groups, including Roma students and those in remote areas, were particularly affected by the sudden shift to remote education.

Solution Implemented:
To mitigate the crisis, the Bulgarian Ministry of Education launched the "Equal Access to School Education in Times of Crisis" project with support from EU REACT-EU funding. More than 85,000 laptops and tablets were distributed to students and teachers to ensure that education could continue. In parallel, the Ministry provided digital skills training to teachers, students, and educational mediators, focusing on essential IT competencies and methods for remote instruction. Special emphasis was placed on inclusive education, with efforts tailored to the needs of Roma communities and other underserved groups. The project also introduced centralized procurement systems, enhanced network infrastructure in schools, and encouraged partnerships between schools and municipalities to ensure equitable access.

Impact & Results:
The initiative significantly improved digital inclusion in Bulgarian schools. Device ownership among students increased, and remote learning became feasible even in disadvantaged areas. Teachers who had previously never used digital platforms gained competence in managing online classrooms. As a result, the project not only bridged the digital divide but also introduced long-term improvements in digital pedagogy and school preparedness for future emergencies. Evaluation data from the OECD highlighted improvements in access, digital literacy, and crisis response capabilities at the system level.

Key Takeaways:
This case illustrates the importance of fast, state-led action in addressing digital exclusion during a crisis. Bulgaria's model of combining device distribution with targeted training contributed to

equitable education continuity. However, the experience also showed that digital transformation requires not only infrastructure but sustained support, capacity building, and follow-up reforms to embed digital practices in teaching and learning.

Reference:
OECD Evaluation Report, *Bulgaria's Equal Access to School Education in Times of Crisis Project* (2025). OECD Link

Case Study 5 – SME

Title: *Digital Transformation Strategies Among Bulgarian SMEs During COVID-19*
Study Conducted By: CEUR Workshop Proceedings (CORONOMICS Project)
Sector: Cross-sector (Manufacturing, Retail, Services)
Target Audience: SME owners and managers across Bulgaria

Challenges:
The COVID-19 crisis hit Bulgarian SMEs particularly hard, exposing gaps in digital infrastructure, business continuity planning, and online customer engagement. Many companies, especially in retail and services, relied heavily on physical interactions and traditional sales channels. Lockdowns and health measures forced them to rethink their operational models almost overnight. Limited resources, low digital maturity, and lack of strategic vision made the transition to digital especially difficult for small businesses.

Solution Implemented:
The CORONOMICS research project documented how 50 SMEs in Bulgaria responded to these challenges through varying digital transformation strategies. The most common approaches included adopting e-commerce platforms, transitioning employees to remote work setups, and introducing digital communication tools such as video conferencing and online customer service. In several cases, SMEs introduced ERP and CRM systems, digitized internal workflows, or shifted marketing operations online. Others used social media and digital marketplaces to maintain customer interaction. Some firms also diversified their business models, launching new digital products and services to stay competitive.

Impact & Results:
SMEs that embraced digital transformation were better able to maintain revenue streams and manage their operations despite physical restrictions. Many reported improvements in efficiency, flexibility, and customer satisfaction. Those that adopted cloud-based systems and e-commerce were particularly resilient. While the transition was not seamless—financial constraints and digital skill gaps persisted—the overall effect was an accelerated modernization of Bulgaria's SME sector. The study found that companies that invested in digital tools during the pandemic were more likely to continue their digital journey beyond the crisis.

Key Takeaways:
This case highlights the necessity of digital agility for small businesses in times of crisis. The COVID-19 period served as a catalyst for innovation and adaptation among Bulgarian SMEs. Future

resilience will depend on continued support for SME digitalization, including access to funding, consultancy services, and digital skills development. Policy frameworks that reduce barriers to technology adoption could help institutionalize these gains and ensure long-term impact.

Reference:
Tsenov, D. et al. (2023). *The Role of Digital Transformation for SMEs During a Health Crisis*, CEUR Workshop Proceedings. CEUR Link

GREECE

Case Study 6 - SME:

Title: "Digital Tools for SMEs" Voucher Scheme (Greece 2.0)

Industry: Cross-sector (nationwide SMEs in all industries)

Target Audience: Owners and employees of small and medium-sized enterprises, particularly those with low digital maturity.

Challenges: Greek SMEs often lacked the capital and know-how to invest in digital technologies. Many small firms were stuck with outdated software or no online presence, citing cost as a barrier. This program was conceived to address the challenge of low digitalization in the SME sector – specifically, the fact that only 39% of Greek SMEs had basic digital intensity. The initiative aimed to overcome financial constraints and technical hesitation that prevented SMEs from adopting new digital tools.

Solution Implemented: The Digital Tools for SMEs program, launched in 2022 under the RRP "Greece 2.0," provides vouchers (digital coupons) that SMEs can redeem for purchasing or leasing a wide range of approved digital products and services. The program is administered by the Ministry of Digital Governance in collaboration with Κοινωνία της Πληροφορίας (Information Society S.A.). In the first phase, eligible SMEs applied online and, based on their size and needs, received vouchers typically ranging from €1,000 up to €20,000 to subsidize solutions such as: business management software (ERP, CRM systems), building an e-commerce website, digital marketing services, cybersecurity tools, cloud computing services, and even basic hardware upgrades. The process was streamlined – a dedicated portal listed certified technology providers from whom SMEs could procure solutions using the voucher. The scheme was broadly publicized through chambers of commerce and SME associations to ensure uptake. Importantly, the program was designed to be inclusive: micro-enterprises with as few as 1–2 employees could apply, and sectors from retail and tourism to manufacturing and agriculture were all covered. In late 2024, a second cycle (Program "Digital Tools for SMEs B'") was launched with a budget of €42 million, funded by the EU Recovery Fund, to expand the reach. This second phase also incorporated feedback from the first cycle,

simplifying application steps and updating the list of eligible digital products (for example, adding support for more advanced solutions like IoT systems for SMEs in agriculture).

Impact & Results: The program has had a significant impact on accelerating SME digitalization in Greece. In the first cycle, more than 17,000 SMEs applied (according to ministry press releases), and thousands proceeded to implement new digital solutions using the vouchers. An estimated 25,000+ digital tool vouchers were redeemed across both cycles to date, reflecting that some firms acquired multiple tools. According to the Ministry's progress statistics, popular purchases included creating over 8,000 new SME websites or e-shops and the adoption of cloud-based accounting or inventory systems by about 5,000 SMEs. Importantly, a survey conducted six months after implementation found that a vast majority of participant SMEs reported improvements in efficiency and customer reach: for instance, small retailers that launched e-commerce sites saw sales increases and local manufacturers adopting digital supply management reported cost savings and better stock control.

The program also indirectly stimulated the local digital economy – Greek IT vendors and service providers saw increased business from voucher clients, effectively creating a mini-ecosystem of digital support for SMEs. The initiative's success is evident in Greece's DESI metrics: the percentage of SMEs with at least a basic level of digital intensity showed an uptick (moving from 39% toward the mid-40s in provisional 2023 data), and Greece slightly improved its ranking in the Integration of Digital Technology indicator. While not solely attributable to the voucher program, experts note it as a major contributing factor.

Lessons Learned: This case provides valuable lessons for digital transformation programs. First, lowering financial barriers through grants or vouchers can effectively motivate SMEs to take the first digital step – many Greek SMEs knew they needed to digitalize but were risk-averse; the voucher reduced that risk. Second, the program underscored the need for accompanying support and training. Some firms initially struggled to utilize their new tools fully; in response, the program administrators teamed up with consultants to offer guidance on implementation (a lesson that simply giving funds isn't enough – SMEs may also require digital literacy support). Third, a user-friendly application process was critical. The Greek scheme kept bureaucracy minimal (applications via an online portal with quick approval), which was praised by participants and is a good practice model. Lastly, this case highlighted the importance of scalability and continuity: digital transformation is not a one-off effort. By moving into a second cycle and planning future rounds, the Greek government signaled ongoing commitment, which helps sustain momentum. For the VETech project, the Digital Tools for SMEs program exemplifies a successful policy-driven intervention that could be replicated or integrated into a broader toolkit – for instance, a recommendation might be to include voucher-based incentives in any strategy to boost SME engagement in digital upskilling or to connect VET graduates with SMEs (e.g. vouchers could also subsidize hiring of digitally skilled VET graduates or consultants for SMEs). Overall, Greece's voucher scheme stands out as a best practice in accelerating SME digital transformation through well-targeted financial support, coupled with stakeholder outreach and iterative improvement.

Case Study 7 - VET:

Title: Digital School Platform – Enhancing VET Education through Hybrid Learning

Industry: Education (Vocational Education & Training sector)

Target Audience: VET students and teachers nationwide, with a focus on those in remote regions (islands, rural areas) and upper secondary VET learners preparing for national exams. Parents and general secondary students also benefit, but VET is a key component.

Challenges: Greece's geography of many islands and mountains means that certain VET programs or specialized courses are not easily available to all students. Small VET schools in remote areas often cannot offer the full range of specializations due to lack of teachers. Additionally, there was a recognized need to modernize teaching methods and provide supplemental learning support outside the classroom. The COVID-19 pandemic showed that a digital infrastructure for education was both possible and necessary. The challenges addressed by the Digital School platform include: educational inequalities (urban vs rural access to quality VET instruction), limited support for students (especially those preparing for high-stakes exams or needing tutoring), and generally low integration of digital resources in daily teaching. Prior to this initiative, Greece had various e-learning tools, but they were fragmented and not comprehensive; VET students had little access to organized digital supplementary lessons or remote learning options.

Solution Implemented: The Digital School platform (psifiako scholeio) is an innovative, centralized online portal launched by the Ministry of Education in 2024, funded by the RRF as part of the Greece 2.0 plan. It is designed as a comprehensive digital ecosystem for education, encompassing both general education and VET. The platform was introduced in a pilot phase starting September 2024, offering several key services: (1) Digital Tutoring: A library of short video tutorials on core subjects (initially Greek language and math) created by experienced teachers. For VET students, this is being expanded to subjects like English for tourism, basic programming, etc. Students can access these 10– 15 minute videos on-demand to review material or learn difficult concepts. (2) Live Tutoring for **National Exams:** Recognizing that many VET students take Panhellenic exams for tertiary education or certification, the platform provides live-streamed classes for exam preparation. For example, third-grade (final year) VET students aiming for university have scheduled live online lessons in subjects such as Technical Drawing or Anatomy (for healthcare VET) taught by expert instructors. These live sessions allow real-time interaction (students can ask questions via chat) and include online quizzes for self-assessment. (3) Remote Classes for Niche Subjects: In a groundbreaking move, the Digital School began facilitating classes in specialized subjects that were not available in some local schools. For instance, a small island's EPAL (vocational high school) with no IT teacher could connect their students to a live digital class taught from Athens in the subject "Applications of IT in Business." This hybrid model has an on-site facilitator teacher while the specialist subject is

delivered virtually. In addition, (4) Parent-School Communication via e-Parents App: The platform includes a mobile app for parents, which – although for all schools – benefits VET institutions by improving engagement with families (sending notifications on attendance, grades, etc.). (5) Interactive Learning Systems: Alongside the software platform, the project equipped schools with hardware – over 36,000 interactive smart boards and touch-screen systems were planned, and by May 2024 more than 20,000 had been delivered to classrooms nationwide. These allow teachers to use the digital content in a more engaging way during in-person lessons, blending physical and digital learning. The Digital School platform is built to be user-centric: students and teachers log in with their school credentials, and the interface aggregates all the above services. Importantly for sustainability, Law 5128/2024 was passed to formalize this platform and its operation, giving it a solid legal and regulatory backing.

Impact & Results: Even in its early stages, the Digital School platform has shown significant positive outcomes. In the pilot year (2024–25 school year), the platform was used by approximately 50,000 students and 4,000 teachers across Greece, including many from VET schools. VET students in at least 30 remote schools gained access to courses they previously couldn't attend due to teacher shortages – for example, students in small Aegean islands were able to take courses in electrical engineering and prepare for certification exams through the platform's remote classes. Teachers report that the digital tutoring videos have been especially beneficial for struggling students: VET learners who sometimes work jobs alongside school could watch lessons at flexible times to catch up on theory. According to Ministry data, the average test scores in pilot schools' exam preparation classes improved by a few percentage points compared to previous cohorts, suggesting the additional support helped. The platform also fostered a culture of digital resource use among educators; thousands of digital lessons and quizzes were uploaded by teachers themselves, expanding the content library. Another outcome is increased equity: by servicing islands and rural areas, the initiative narrowed the gap in educational opportunity. Anecdotally, a VET student from a mountain village who aspired to study computer science noted that through the Digital School's live preparatory classes, he could receive coaching on advanced mathematics that was not available locally, which he credited for his success in the Panhellenic exams. Moreover, the introduction of interactive boards in classrooms has modernized day-to-day teaching – lessons became more visual and engaging, which teachers say improved student attention and practical understanding (e.g., automotive VET classes can now display 3D models of engine parts on the board). The Digital School platform won praise as a best practice in a December 2024 Cedefop national news report for "enhancing the school environment and reaching particularly the islands and remote regions", calling it a pioneering initiative in Europe.

Lessons Learned: This case offers several lessons for integrating digital technology in VET education. First, it underscores the importance of infrastructure coupled with content: providing hardware (interactive systems) boosted teachers' ability to use the digital content effectively. Projects should ensure that digital content delivery is matched with appropriate tools in classrooms. Second, the Digital School demonstrates how a hybrid approach can maximize reach – combining online

centralized expertise with local support. This model can be replicated in other countries with geographic challenges or teacher shortages in certain trades. Third, one challenge faced was initial resistance from some educators who were unaccustomed to online teaching; the project addressed this by training those teachers and involving them in content creation, highlighting that getting teacher buy-in is crucial for success. Fourth, the role of policy and funding was key: by anchoring the platform in law and funding it through the RRF, the Greek government ensured it wasn't just a short- term pilot but a sustained service. This points to a lesson that institutionalization and policy support greatly aid the longevity of digital education reforms. Finally, the platform's focus on exam preparation and core subjects taught us that digital initiatives should target clear pain points (like exam prep stress and lack of teachers) to gain quick wins and support. Now that the platform is established, the plan is to expand its VET offerings (e.g., more tutorials in vocational subjects, virtual internships through the platform). For the VETech database, the Digital School platform serves as an excellent example of leveraging digital technology to extend educational access and enhance learning quality in VET. It highlights the value of innovative public-sector solutions and could inspire similar digital learning portals or resource-sharing platforms in other contexts. The success of this case reinforces that digital transformation in VET is not only about teaching IT skills, but also about transforming the way education is delivered to be more inclusive, flexible, and engaging.

Section 7: Key Takeaways & Recommendations for the VETech Toolkit

HUNGARY

Hungary's national findings point to a fragmented but evolving digital landscape within both SMEs and VET institutions. While national strategies and EU-funded programs have led to some advances, the digital maturity of Hungarian SMEs, particularly micro-enterprises, remains low. Many SMEs adopt digital tools reactively, often without a strategic plan or long-term vision. VET institutions, meanwhile, are attempting to modernize their teaching methods but frequently lack the infrastructure and educator training needed to do so effectively. A notable issue is the disconnect between VET curricula and actual labour market needs – digital skills taught often don't match employer expectations. Furthermore, regional disparities are pronounced, with rural areas experiencing far lower levels of digital infrastructure and readiness. Collaboration between SMEs and VET schools exists only in isolated cases and lacks formalized structures or mutual planning. The Hungarian case reveals a need for more robust, longitudinal research into the impact of digital transformation policies and practices. For the VETech Toolkit, Hungary's situation emphasizes the importance of tracking digital skill gaps by region and sector, integrating SME feedback into VET curriculum design, and cataloguing both challenges and successful case studies. The toolkit should

also explore targeted training methodologies and promote policies that stimulate SME–VET partnerships in a structured, sustained manner.

BULGARIA

The Bulgarian case highlights a mixed digital readiness landscape, with increasing awareness among SMEs of the importance of digital transformation, yet persistent barriers related to limited financial and human resources. SMEs show a strong willingness to adopt digital tools but often lack tailored support, strategic guidance, and funding. VET trainers play a crucial role in building digital competencies, but many feel ill-equipped due to inadequate access to upskilling opportunities and insufficient digital infrastructure. While students are generally motivated and interested in digital tools, their exposure is limited to traditional instruction methods, with innovative pedagogies like gamification, project-based learning, and simulations still underutilized. The national framework aligns well with EU priorities, but implementation is fragmented and uneven across regions, reinforcing the urban-rural divide. There is a need for more regionally adaptable initiatives and for peer-learning models that empower educators. For the VETech Toolkit, Bulgaria's findings suggest the inclusion of practical resources such as modular DigComp-based content, rural-focused strategies, and trainer mentoring schemes. Emphasis should also be placed on offering step-by-step transformation templates, showcasing successful national programs, and ensuring that tools are suitable for low-resource environments. These elements will ensure the toolkit supports bottom-up, inclusive digital transformation.

GREECE

Greece's findings underscore a digital divide that is slowly narrowing, supported by national reforms and EU funding. Although Greece ranked low on DESI indicators as recently as 2022, programs like the "Digital Tools for SMEs" voucher scheme and the Digital School platform are helping bridge the gap. SMEs, especially in rural areas and in traditional sectors like retail and agriculture, still face challenges such as limited funding, digital illiteracy, and resistance to change. The government's digital transformation strategy targets 90% SME digital readiness by 2030, focusing on infrastructure, skills, and inclusive access. In the VET sector, there is a growing emphasis on digital skills integration through tools like DigComp 2.2, yet many educators remain at a basic level of digital competence. Practical, project-based, and hybrid models have gained traction post-COVID, but uneven implementation persists, particularly in under-resourced areas. The need for alignment between VET outcomes and SME needs is evident. For the VETech Toolkit, Greek insights highlight the importance of documenting barriers to SME digitalization, supporting coordination between VET and businesses, and presenting best practices like hybrid classrooms and simulation labs. Emphasis should be placed on policy alignment, stakeholder cooperation, and mentoring systems to empower both teachers and entrepreneurs.

General Recommendations for the VETech Toolkit

The following recommendations go beyond the funding opportunities of the current Erasmus+ project.

1. Structure and Thematic Organization

- Organize toolkit entries under clearly defined thematic categories aligned with the VETech project structure, such as digital skill needs, training methodologies, institutional readiness, and SME transformation challenges.
- Enable cross-country comparison by standardizing data from desk research and national surveys. Ensure that the toolkit entries align with the VETech project's existing thematic categories and organizational framework, allowing for easy comparison of data, case studies, and findings across countries.

2. Mapping Labour Market Needs

- Document digital skills currently required in the labour market, particularly in the context of SME digital transformation.
- Provide up-to-date information on foundational (digital communication, online collaboration, basic ICT use, etc.) and advanced (cybersecurity, cloud computing, data analysis, AI, and IoT) digital skills required in SMEs, linking them to industry demands and regional trends. Use both survey data and policy insights to highlight key skill shortages.

3. Identifying and Addressing Barriers

- Document cross-cutting obstacles that commonly hinder digital transformation across countries. These include limited funding, outdated infrastructure, low digital literacy, and cultural resistance to adopting new technologies. Use comparative insights to showcase how these barriers manifest differently in SMEs and VET institutions.
- Provide concrete examples from national case studies that illustrate how countries have responded to these challenges. Highlight successful policies, targeted training programs, public-private initiatives, and low-cost digital tools that have addressed specific barriers, particularly in rural or underserved regions.

4. Case Studies and Good Practices

- Feature replicable examples of digital transformation in VET and SME contexts that highlight successful implementation and measurable impact. These case studies should include diverse geographic and institutional settings, with clear outcomes that demonstrate progress in digital skills acquisition, efficiency, or learner engagement.
- Prioritize examples that incorporate innovative teaching methods such as hybrid learning environments, gamification strategies, and digital mentorship programs. Also highlight strong collaborations between VET institutions and businesses that result in mutual upskilling, curriculum co-creation, or joint pilot projects.

5. Practical Tools and Templates

- Offer comprehensive checklists, modular planning templates, and detailed implementation guides tailored to diverse user profiles, such as rural SMEs, urban VET institutions, and micro-enterprises. These tools should support users throughout all phases of digital transformation, from needs assessment to project execution.

- Ensure that all resources are adaptable to different contexts and levels of digital maturity. Include step-by-step frameworks that simplify complex processes and provide visual aids or examples where possible. This will empower institutions and businesses to customize digital strategies effectively and independently.

6. Training Content and Methodologies

- Curate modular and adaptable training resources grounded in EU frameworks such as DigComp and DigCompEdu. Include a range of instructional formats, from simulations and interactive e-learning to gamified learning paths and real-world project-based assignments that cater to varying learner levels.

- Provide continuous professional development resources for educators, including mentorship programs, online communities of practice, and 'train-the-trainer' models. These tools should enhance digital pedagogy skills and support the integration of emerging technologies into vocational curricula.

7. Support for Rural and Disadvantaged Regions

- Design targeted strategies that ensure access to digital transformation tools and training in underserved regions. This includes prioritizing low-bandwidth solutions, mobile training units, and offline-compatible educational content for areas with limited internet access.

- Develop localized mentoring programs and support networks that cater specifically to the needs of micro-enterprises and VET institutions in rural communities. Encourage community-driven approaches to build digital competence and reduce the urban–rural divide.

8. Institutional Readiness and Curriculum Modernization

- Track and analyze the digital readiness of VET institutions across multiple dimensions— including infrastructure availability, teacher digital competence, and alignment of curricula with evolving labour market needs.

- Highlight persistent challenges such as outdated curriculum design, insufficient digital teaching materials, and gaps in educator training. Emphasize the need for structured modernization plans that ensure VET graduates acquire the digital competencies required by today's SMEs.

9. National Policies and Funding Frameworks

- Catalog relevant national and EU-level policy documents that shape the digital transition landscape for both SMEs and VET institutions. Include frameworks such as national digital transformation strategies, education modernization plans, and SME support roadmaps.
- Provide an overview of accessible funding mechanisms - including voucher schemes, EU structural funds, and public-private partnerships - and explain how stakeholders can leverage them to support digital capacity-building.

10. Monitoring and Evaluation

- Recommend monitoring tools such as SELFIE and other digital maturity assessment frameworks to help institutions and SMEs evaluate their progress in digital transformation.
- Define clear Key Performance Indicators (KPIs) such as the percentage of trained educators, the number of SMEs receiving digital support, and the extent of curriculum modernization.
- Promote evidence-based review mechanisms through annual progress evaluations, feedback loops, and regular updates to ensure continuous improvement.

By implementing these recommendations, the VETech toolkit can serve as a dynamic, evidence-based tool that supports inclusive and practical digital transformation across European VET and SME ecosystems.

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Online Survey Analysis

Analysis of data and Conclusions from the Hungarian context

Timeframe for data collection: 29/04/2025 – 15/05/2025

Total number of respondents: [35], of which:

- SME representatives: 10
- VET trainers: 11
- VET students: 14

Analysis of data:

The responses to the "Erasmus+ VETech Questionnaire" provide valuable insight into the digital maturity and challenges faced by SMEs, educators, and students within the vocational education and training (VET) sector. The survey was completed by 35 respondents, with a balanced distribution among SME representatives (40%), VET educators (31.4%), and students (28.6%).

Regarding SME digitalization, 90% of respondents indicated that their companies have partially adopted digital technologies—mainly in marketing or customer service—while only 10% reported full digital integration. The most commonly cited barriers to digital adoption include employees' lack of digital skills (80%), lack of financial resources (70%), and the complexity of digital solutions (40%).

Among educators, 81.8% already use digital tools in teaching—mostly occasionally—while 18.2% do not yet use them but are open to it. Their main challenges include insufficient training on digital tools (54.5%) and inadequate digital infrastructure in educational institutions (27.3%). For skill development, most educators find practical training on the latest digital methods (63.6%) and access to online learning materials (54.5%) most beneficial.

Student responses revealed that the majority (57.1%) use digital tools only occasionally in their learning, and they most want to improve in areas such as online collaboration, digital problem-solving, content creation, and basic coding. While many have not yet participated in digital skills training, 35.7% feel fully or very prepared for jobs requiring digital competencies. To make digital education more appealing, students suggest an increase in project-based learning and practical approaches.

In summary, the questionnaire highlights that while respondents recognize the importance of digitalization, progress is significantly hindered by the lack of training, infrastructure, and financial support. There is a clear demand for well-structured, practice-oriented digital education, and a need for targeted approaches that consider the specific needs of each stakeholder group to support a successful digital transition.

Conclusions

SMEs:

1. **Level of digitalization:** 90% have adopted digital tools partially, mostly in areas like marketing and customer service.
2. **Main barriers:** Digital transformation is mainly hindered by employees' lack of digital skills (80%) and lack of funding (70%).
3. **Skill gaps:** Employees mostly lack skills in cloud computing and online collaboration tools (50%).
4. **Training participation:** 60% have not yet participated in digital skills training but are interested.
5. **Preferred learning formats:** Short online courses (80%) and practical workshops (50%) are considered most useful.

VET trainers:

1. **Use of digital tools:** 81.8% use digital tools in teaching, mostly occasionally.
2. **Main barriers:** Lack of adequate training (54.5%) and insufficient digital infrastructure (27.3%) hinder digital teaching.

3. **Confidence level:** Few educators feel fully confident in applying digital skills in their teaching.
4. **Development needs:** Most would benefit from hands-on training (63.6%) and access to online teaching materials (54.5%).
5. **Support expectations:** Peer mentoring and policy-level support are also seen as helpful.

VET students:

1. **Frequency of digital tool usage:** The majority (57.1%) use digital tools only occasionally for learning.
2. **Skills to develop:** Students mostly want to improve in online collaboration (50%), digital problem-solving (35.7%), and content creation (35.7%).
3. **Training experience:** 50% have not taken part in digital skills training but would like to.
4. **Motivators:** Project-based learning (64.3%) and practical, interactive approaches (28.6%) would make digital education more appealing.
5. **Job readiness:** 35.7% feel fully or very prepared for jobs that require digital skills.

Analysis of data and Conclusions from the Bulgarian context

Timeframe for data collection: May 2025

Total number of respondents: **34** *of which:*

- SME Representatives: 10
- VET Trainers: 10
- VET Students: 14

Analysis of data:

The Bulgarian survey findings paint a mixed but evolving picture of digitalization across SMEs and the vocational education and training (VET) sector. All surveyed SMEs indicated partial adoption of digital tools - primarily for customer communication, marketing, and accounting - yet none reported a fully digitalized business model. Key obstacles to broader implementation include limited financial resources, technical complexity of digital tools, and low digital literacy among employees. Cultural resistance and lack of long-term strategic vision were also noted. Cybersecurity, data analytics, and automation emerged as prominent digital skill gaps. Despite these barriers, there is evident interest among SMEs in upskilling their workforce, with short online courses, hands-on workshops, and mentoring programs preferred as training formats. These responses underscore the need for practical and accessible learning tools that can directly support SME operational efficiency.

VET trainers reported varying degrees of confidence in teaching digital skills, averaging 3.2 on a 5-point scale. While some use digital tools extensively, others apply them only occasionally or not at all. Their main challenges include inadequate training on digital platforms, outdated curricula, and insufficient access to digital infrastructure. Trainers expressed a clear need for hands-on professional development, particularly training on emerging digital tools and greater availability of quality online teaching resources. Peer mentoring and institutional support were also welcomed.

Students showed high engagement with digital tools in daily learning, with nearly all respondents using them regularly. Nonetheless, gaps remain in content creation, online collaboration, data analysis, and digital troubleshooting. Students expressed strong preferences for interactive learning formats—especially project-based learning, simulations, and gamification. While many had access to digital training through school or independently, some still lacked exposure. On average, students rated their readiness for digital employment at 3.7/5, indicating moderate confidence with room to grow. The findings highlight a motivated learner base in need of more job-relevant, engaging digital education experiences.

Conclusions

SMEs:

1. All respondents use digital tools to some extent, mainly in basic business functions.
2. Key barriers: financial constraints, lack of skills, and complexity of tools.
3. Skill gaps include cybersecurity, data analytics, and AI.
4. Training is preferred in short, practical formats like online courses and workshops.
5. Strong interest in mentoring and coaching programs.

VET trainers:

1. Mixed confidence in teaching digital skills, average 3.2/5.
2. Use of digital tools varies significantly.
3. Main barriers: lack of training and digital infrastructure.
4. Strong demand for hands-on training and teaching resources.
5. Express interest in mentoring and peer support.

VET students:

1. Most use digital tools daily but still feel underprepared.
2. Common gaps: content creation, collaboration, data skills.
3. Training experiences vary; some are self-taught.
4. Prefer gamified, interactive, and project-based learning.
5. Job readiness rated moderately at 3.7/5.

Analysis of data and Conclusions from the Greek context

Timeframe for data collection: 29/04/2025-15/05/2025

Total number of respondents: *40, of which:*

- SME representatives: 16

- VET trainers: 12
- VET students: 12

Analysis of data:

Greece's survey responses provide a detailed view of the country's advancing but uneven digital transformation in SMEs and VET. Among SMEs, the majority (62.5%) reported partial digitalization—mostly limited to marketing, communication, or administrative processes—while only a small fraction (12.5%) had achieved full digitalization. Another 18.75% expressed intentions to digitalize soon, while 6.25% had no plans at all, suggesting persistent disparities. Barriers included employee digital skill gaps (62.5%), limited funding (56.25%), unclear benefits of digital tools, and resistance to change. Respondents identified critical skill deficits in cybersecurity, cloud computing, and digital marketing, emphasizing a pressing need for workforce upskilling.

Although some SMEs had accessed training through private or government-funded programs, 43.75% expressed strong interest in future training opportunities. Preferences leaned heavily toward short, accessible, and practical formats such as online courses and hands-on workshops. Coaching and simulation-based learning were also mentioned, though to a lesser extent. The findings signal a clear appetite for flexible and targeted learning solutions that address real business needs.

In the VET context, trainers showed moderate to fairly high confidence in teaching digital skills, yet many struggled with insufficient digital training, outdated curricula, and poor infrastructure. About 83% of trainers use digital tools in their teaching, but many rely on occasional rather than extensive use. Trainers prioritized practical support, especially hands-on training on emerging tools and access to curated digital resources. Peer mentoring and policy-level changes were seen as less immediately impactful.

Students revealed a mixed relationship with digital tools: while one-third used them weekly, daily usage remained limited. Common skill gaps included online collaboration, digital problem-solving, and basic programming. Students favored interactive, real-world learning formats like simulations, gamification, and project-based learning. Half had not received formal training but expressed strong motivation to learn. Overall, Greek students demonstrated enthusiasm for digital learning but lacked consistent institutional support to reach job-ready proficiency.

Conclusions

SMEs:

1. 62.5% are only partially digitalized; 6.25% not at all.
2. Top barriers: digital skills gap, lack of funds, unclear benefits.
3. Skill deficits: cybersecurity, cloud tools, marketing.
4. Many SMEs seek future training, especially short online formats.
5. Mentoring and applied learning formats are in demand.

VET trainers:

1. Confidence mostly moderate to fairly high.
2. 83.3% use digital tools; 16.7% are willing but unskilled.
3. Main barriers: lack of training and infrastructure.
4. Desire hands-on tool training and better teaching resources.
5. Peer mentoring is less preferred, but valued by some.

VET students:

1. Digital tool usage varies; only 16.7% use them daily.
2. 50% want digital training; many lack formal access.
3. Skills lacking: online collaboration, coding, problem-solving.
4. Favor simulations, gamification, and real-world projects.
5. Moderate job readiness; education not fully aligned with labor needs.

Cross-Country Summary and Key Takeaways

Across Hungary, Bulgaria, and Greece, the survey results reveal a shared trajectory: while awareness of digital transformation is growing, practical implementation remains limited. SMEs consistently face barriers such as lack of funding, employee skills, and technological complexity. They express strong interest in training—especially short, flexible, and practical formats.

VET trainers across countries show varying degrees of digital competence. Most use digital tools but highlight the need for upskilling, access to teaching resources, and infrastructure upgrades. Peer mentoring and policy support are welcome but secondary to hands-on professional development.

VET students are generally engaged and motivated but report significant skill gaps in areas critical to the digital economy—collaboration, content creation, and data handling. Their preferences lean toward interactive, project-based, and gamified learning experiences.

Key takeaways for the VETech project include:

• A unified need for modular, practice-oriented digital training tools.

• Demand for greater SME–VET collaboration in curriculum development.

• Necessity to tailor support for rural, under-resourced institutions.

• High value placed on hybrid learning models and real-world case studies.

• Strong potential for simulation-based and micro-learning approaches.