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CEDEFOP

VET needs to go digital

Upgrading the backbone of Europe's twin transition

POLICY BRIEF

POLICY BACKGROUND

In this section

Overcoming digital skills challenges in vocational education and training

Expectations for the contribution of European vocational education and training (VET) to the digital transition are unprecedented. Prolonged school closures during the COVID-19 pandemic fundamentally challenged the prevailing work and learning paradigms and put in motion a process of rapid digital transformation in VET that would have taken years to achieve under normal circumstances. The pandemic highlighted wider economic and social barriers to the twin digital and green transition and exposed major untapped digital potential in VET.

The rapid acceleration of digitalisation and the increasingly complex demands of interconnected economies and societies make it hard to keep up with change, and this poses a challenge to VET learners. Big data and the ongoing development of artificial intelligence (AI) methods, such as machine or deep learning, make it possible to automate to some extent problem solving, knowledge representation, reasoning or planning activities. They give machines the capacity to carry out complex (cognitive) processes without much human intervention. Until recently, this was unimaginable, as for even the most advanced innovations in information and communication technologies (ICT) in the past, human input or oversight remained vital.

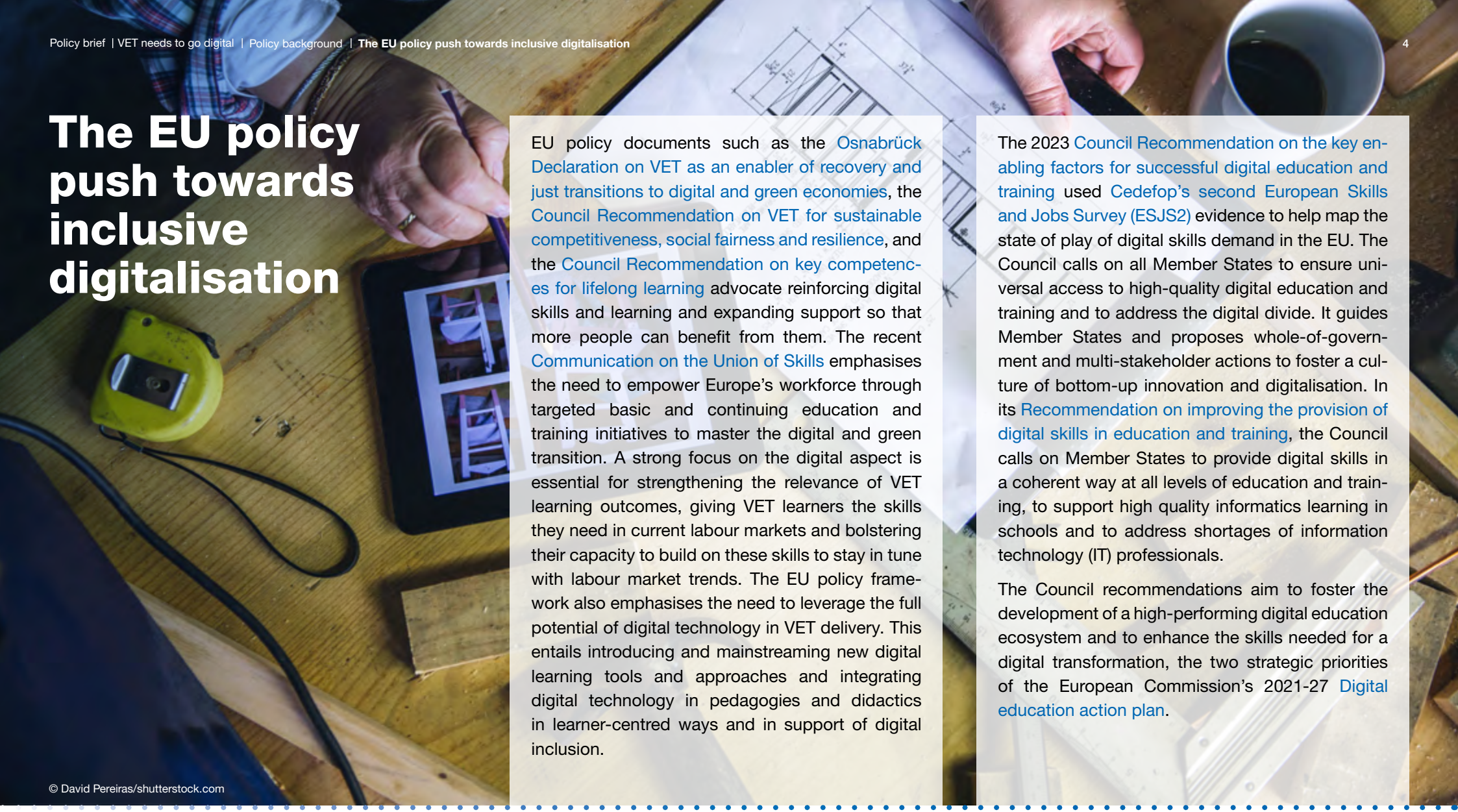
Europe's VET systems need to be excellent whilst safeguarding labour market and social inclusion to ensure that VET graduates are prepared for work in the digital age and Industry 4.0 and 5.0 ([1]) work environments. Digital skills have become a transversal requirement in jobs in most if not all economic sectors and occupations (Cedefop, 2023a). 9 in 10 EU workers use at least one digital device to carry out their job tasks (Cedefop, 2022), and 28% of adult employees are in a workplace where AI technology is used (Cedefop, 2025) ([2]). In an increasingly digital world of work and learning, basic digital skills do not suffice. Medium and higher-level digital skills have become an integral driver of labour market and social participation, and they shape employability and career development prospects.

In occupations that depend on VET programmes to supply the workforce, up-to-date knowledge of new and emerging computerised technology and digital tools is vital. There are strong indications that many recent VET graduates may be at risk of social exclusion because their digital skills are underdeveloped or out of date. Cedefop's (European Centre for the Development of Vocational Training) 2016 VET opinion survey showed that – at the time – only 4 in 10 VET graduates developed their digital skills as part of their formal upper secondary education and training.

([1]) Industry 4.0 is a term that originated in Germany that has been used to refer to the combined use of new digital technology such as advanced robotics and AI, powered by sensors and 'real time' big data across the whole production system, to ensure that manufacturing is 'fit for the future'. Industry 5.0 is a new key paradigm of EU industrial policy aiming to ensure the continuation of the previous Fourth Industrial Revolution by ensuring that the goals of sustainability, human-centricity and resilience are met (Oeij et al., 2024).

([2]) How to get ready for AI in the workplace – Cedefop's AI skills survey.

The EU policy push towards inclusive digitalisation



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EU policy documents such as the Osnabrück Declaration on VET as an enabler of recovery and just transitions to digital and green economies, the Council Recommendation on VET for sustainable competitiveness, social fairness and resilience, and the Council Recommendation on key competences for lifelong learning advocate reinforcing digital skills and learning and expanding support so that more people can benefit from them. The recent Communication on the Union of Skills emphasises the need to empower Europe's workforce through targeted basic and continuing education and training initiatives to master the digital and green transition. A strong focus on the digital aspect is essential for strengthening the relevance of VET learning outcomes, giving VET learners the skills they need in current labour markets and bolstering their capacity to build on these skills to stay in tune with labour market trends. The EU policy framework also emphasises the need to leverage the full potential of digital technology in VET delivery. This entails introducing and mainstreaming new digital learning tools and approaches and integrating digital technology in pedagogies and didactics in learner-centred ways and in support of digital inclusion.

The 2023 Council Recommendation on the key enabling factors for successful digital education and training used Cedefop's second European Skills and Jobs Survey (ESJS2) evidence to help map the state of play of digital skills demand in the EU. The Council calls on all Member States to ensure universal access to high-quality digital education and training and to address the digital divide. It guides Member States and proposes whole-of-government and multi-stakeholder actions to foster a culture of bottom-up innovation and digitalisation. In its Recommendation on improving the provision of digital skills in education and training, the Council calls on Member States to provide digital skills in a coherent way at all levels of education and training, to support high quality informatics learning in schools and to address shortages of information technology (IT) professionals.

The Council recommendations aim to foster the development of a high-performing digital education ecosystem and to enhance the skills needed for a digital transformation, the two strategic priorities of the European Commission's 2021-27 Digital education action plan.

...the EU policy framework emphasises the need to **leverage the full potential of digital technology** in VET delivery...

...**Cedefop's second European Skills and Jobs Survey** (ESJS2) evidence helps to map the **state of play of digital skills demand** in the EU...

...EU Council recommendations aim to foster the development of a high-performing digital education ecosystem and **to enhance the skills needed for a digital transformation**...

The plan:

- proposed to expand cooperation on digital education at European level to address the challenges of the COVID-19 pandemic and to present opportunities for the education and training community, policymakers and researchers; set out key enabling factors for successful digital education and training, recommended blended learning approaches for high-quality and inclusive primary and secondary education and made improving digital education content a priority;
- called for investment in connectivity and digital equipment for education and training institutions;
- paved the way for piloting a European digital skills certificate, based on the European digital competence framework, to strengthen trust in digital skills certification across the EU and to ease its acceptance, which will facilitate, streamline and upscale the recognition of digital skills by employers, training providers and other players

The action plan is a key enabler in the process towards realising the vision set out in the European education area by 2025 and in line with the solidarity and inclusion pillar of the European digital rights and principles, which position access to internet and digital skills as a universal right. It also contributes to the policy aims and targets of the European Skills Agenda, the European social pillar action plan, the 2020–30 digital agenda for Europe and the 2030 digital decade policy programme. The latter is a comprehensive framework of policy targets, objectives and projects that guides the EU in its digital transition (Figure 1). The EU AI Act adopted in 2024 set a global standard for mainstreaming AI by safeguarding data subjects' rights and by ensuring that AI development, deployment and use is trustworthy.

Figure 1. **Europe's digital decade targets for 2030**

BASIC DIGITAL SKILLS
minimum 80%
of adults

ICT SPECIALISTS
20 million +
gender convergence

TECH UP-TAKE
75% of EU companies
using Cloud, AI, or Big data

LATE ADOPTERS
more that 90% of SMEs
reach at least a basic level
of digital intensity

DIGITALISATION OF PUBLIC SERVICES
100% online
(for key public services)

Source: European Commission.

EVIDENCE

In this section

The difference VET makes – research findings

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Much of the academic literature on the education-to-work transition has tried to answer whether a more vocational or general study orientation can lead to better labour market outcomes. Research has often shown that VET can outperform general education in the short term, because VET graduates need less time to find a job, have higher initial earnings and experience a better match between their skills and job requirements at the start of their career (Cedefop, 2012). These advantages may turn out to be short-lived (Verhaest et al., 2018) when looking beyond the years following the transition into work. Research has also shown that the generic, cognitive nature of skills acquired by general education graduates improves long-term employability (Hanushek et al., 2017). The initial benefits of having job-specific technical skills can turn into a disadvantage when technological change rapidly changes job tasks and renders the skills of VET graduates obsolete.

This idea often relies on the assumption that the digital intensity of jobs held by VET graduates and the speed of technological change is higher than in the jobs of their counterparts with general education. It is reinforced by evidence showing that workers with a VET background participate less in continuing (on-the-job) learning compared to workers with a general education qualification (Tobback et al., 2024), which accentuates skill mismatches over time. This negative impact on skills and its cumulated effect over time partly depends on VET programme delivery. Graduates from apprenticeships and other VET programmes with a strong work(place)-based learning component may be less adaptable and willing to continually upskill or reskill than those who completed predominantly school-based VET or general education (Hanushek et al., 2017; Neyt et al., 2020).

Measuring and understanding education and labour market outcomes of VET graduates vis-à-vis people with a general education qualification is challenging (Box 1). Even though considerable progress has been made in the EU statistical system, empirical data that reliably and simultaneously maps education background and orientation, the digital intensity of jobs and formal, non-formal and informal learning is scarce.

...**VET graduates** need **less time to find a job**, have **higher initial earnings** and experience a **better match** between their **skills** and **job requirements**...

...but having job-specific **technical skills** can turn into a **disadvantage when technological change** rapidly **changes job tasks**...

...workers with a **VET background participate less** in **continuing learning** compared to **workers** with **general education**...

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Box 1. **Challenges in comparing VET and general education graduates**

Making a robust comparison between the labour market outcomes of vocational and general education is challenging from a statistical perspective. Many key factors that determine which upper or post-secondary education programme young people choose are not covered in datasets. Such factors include cognitive abilities, psychological traits and other unmeasured characteristics, and they explain not only why a learner decides to pick a vocational or a general education programme, but also explain follow-up learning and observed labour market outcomes. Cedefop's second European Skills and Jobs Survey, for example, shows that 28% of VET graduates who had to learn new digital technologies did so with the support of family or friends – much less than the 40% of general education graduates relying on such support. The gap points towards stark differences in parental background. The tendency of most young learners in general education to transition into higher education and differences in drop-out rates between VET and general education also make it challenging to draw valid conclusions based on direct comparisons.

Source: Cedefop.

VET graduates – better matched but in less digital jobs

Cedefop's second European Skills and Jobs Survey carried out among European adult workers in 2021 collected detailed information on digitalisation, skill mismatches and different types of learning (Box 2). The survey resulted in unique information on the types of digital activities European workers carry out as part of their main job and the types and levels of digital skills required. It also maps learning required to use new digital equipment and digital skills development via formal, non-formal and informal learning. ESJS2 captures the programme orientation (general or vocational) of the highest qualification of those surveyed, where vocational means a programme designed for acquiring knowledge and skills closely linked to a particular job or trade or a particular group of jobs and trades ([3]).

([3]) The formulation of the question is subjective, and answers may not always be aligned to formally recognised national VET programmes. It is nevertheless a good approximation, as the correlation between the ESJS2 VET graduate share (International Standard Classification of Education levels 3-4) and the official Eurostat figures is 0.74 and significant.

ESJS2 and other evidence (Neuber-Pohl et al., forthcoming) finds that VET graduates find better-matched jobs more easily than their general education counterparts. Satisfaction with the match between jobs, qualifications and skills is significantly higher among adult workers with a VET qualification than it is among workers with general education (49% versus 41%). ESJS2 data reveals workers with a VET background are also less likely to be overqualified for their jobs.

...**Cedefop's second European Skills and Jobs Survey** collected detailed information on digitalisation, skill mismatches and learning...

...it also **maps learning required to use new digital equipment** and digital skills development...

...**satisfaction** with the match between jobs, qualifications and skills is **higher among adult workers with VET** than it is among workers with general education...


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Box 2. Cedefop's second European Skills and Jobs Survey

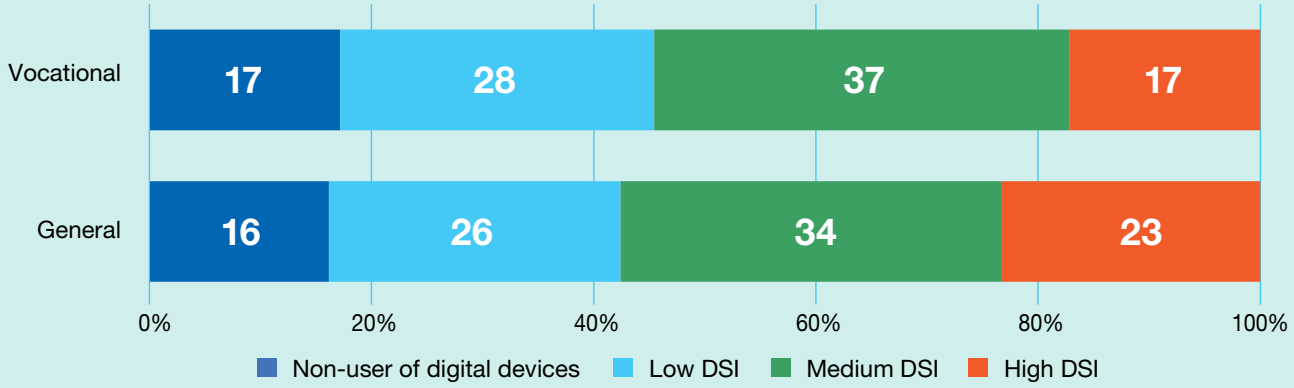
ESJS2 is the second wave of a periodic Cedefop survey collecting information on job-skill requirements, digitalisation, skill mismatches and initial and continuing learning. Fielded in Q2 2021, ESJS2 collected information about 46 213 adult workers in the EU-27 Member States plus Norway and Iceland (EU+).

The ESJS2 captures the sociodemographic profile of adult workers, including the orientation (VET or general education) of their highest education attainment. It offers a wealth of insight on jobs and workplaces, and maps the task structure of jobs to proxy job-skill requirements in European labour markets. ESJS2 also collects information on work organisation, different types of skill mismatch and labour market outcomes.

To measure digitalisation, the ESJS2 asks workers about the use of computing devices needed to do their main job. It also includes a battery of questions on digital activities (e.g. internet browsing, word processing, database management, programming), and on the use of computerised machines (e.g. digital scanners, robots, computer numerical control machine tools). Digital skills development is captured via questions on learning to use new digital technology and recent formal, non-formal or informal digital skills training.

Source: European Skills and Jobs Survey (Cedefop).

Figure 2. Digital skills intensity of jobs in EU+ countries by programme orientation



NB: Sample includes upper secondary and post-secondary, non-tertiary graduates. Cedefop's digital skill intensity index captures 10 types of digital activities used at work. Weighted data. More information on the index can be found in *Setting Europe on course for a human digital transition* (Cedefop, 2022).

Source: ESJS2 (Cedefop).

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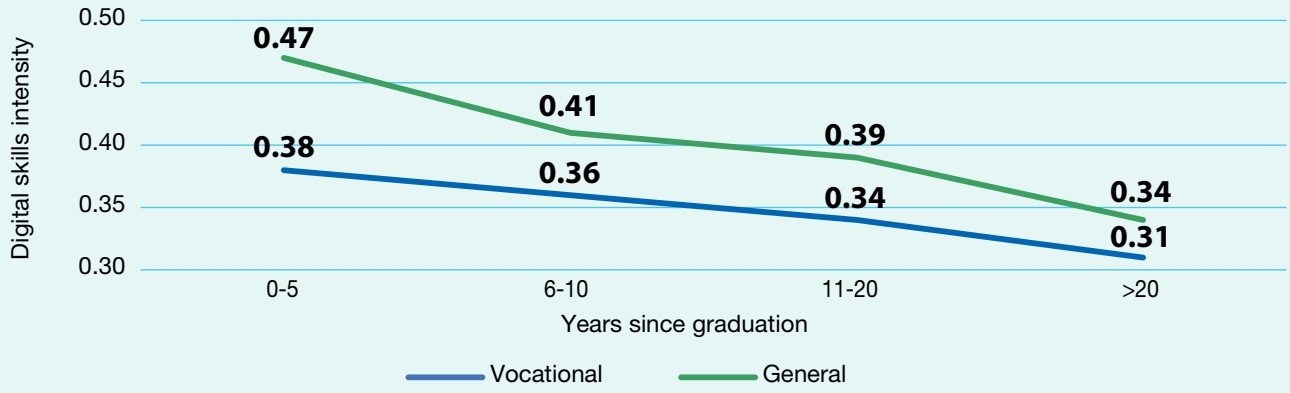
Cedefop compared the jobs of VET and general education graduates from upper secondary and post-secondary programmes using the Cedefop digital skills intensity index (Cedefop, 2022). Workers with a VET qualification are more often employed in jobs that require a lower digital skill level than those with a general education (Figure 2). VET graduates are more likely than their general orientation counterparts to carry out low or moderate digital tasks (e.g. internet browsing, sending emails, word processing, using occupation-specific software). A larger share of jobs held by generally educated workers requires higher digital skills, such as advanced database management, programming or ICT development and maintenance.

Lower digital skill needs do not only reflect older age or cohort effects but are also evident for younger workers (aged 25-34), those who have graduated just a few years ago or who have recently made an education-to-work transition (Figure 3). The gap between the digital skills intensity of jobs held by general and vocational graduates with a medium level of education is marked no matter how long people have been on the labour market. Recent VET graduates on average access jobs with significantly lower digital skill requirements and while the gap with general education decreases over time, it remains significant even 20 years after graduation.

Figure 3. **Digital skills intensity of jobs in EU+ countries by programme orientation and years since graduation**



NB: Online ESJS2 sample of upper secondary and post-secondary, non-tertiary, graduates. Weighted data.

Source: ESJS2 (Cedefop).

Low skill needs compromise digital upskilling

A job that only requires relatively lower-skilled digital tasks reduces the motivation to keep learning and to upgrade digital skills. According to Tobback et al. (2024), differences in access to jobs that offer learning opportunities is among the factors explaining why graduates with vocational education and graduates with general education may differ in how much they learn after entering the labour market.

Cedefop's ESJS2 shows that the share of workers learning to use new digital technologies in their main job (i.e. upgrading their digital skills) is lower among VET graduates compared to workers with general education. In 2020-21, 35% of mid-level graduates from general education programmes had to learn to use new digital technology (computer software and/or computerised machines), while this was true for 31% with a VET background (Figure 4). For younger VET graduates, the difference in digital upskilling opportunities is more pronounced.

Alongside less exposure to technological innovation – a catalyst for further digital skill acquisition – fewer medium-educated VET graduates participate in formal or non-formal job-related education or training (e.g. courses, seminars or instructor-led on-the-job training) to further develop their digital skills.

In 2020-21, 43% of workers with a VET background took part in at least one formal or non-formal educational or training activity to improve their digital skills – less than the 49% of workers with a general education who trained to do so. It is true, as one would expect, that more workers educated vocationally participate in digital skills training in medium and highly digitally intensive jobs than in jobs requiring low digital skills (58% versus 26%, respectively). But the training gap between workers with a VET qualification and those educated in a general programme is visible in all types of digital jobs.

...the share of **jobs** requiring learning to **use new digital technologies** is **lower among VET graduates** compared to workers with general education...

...a **job** that only requires relatively **lower-skilled digital tasks reduces the motivation** to keep learning and **to upgrade digital skills**...

...Cedefop's ESJS2 shows that **workers with a VET background** took part in **training to improve their digital skills less than workers** with **general education** background...

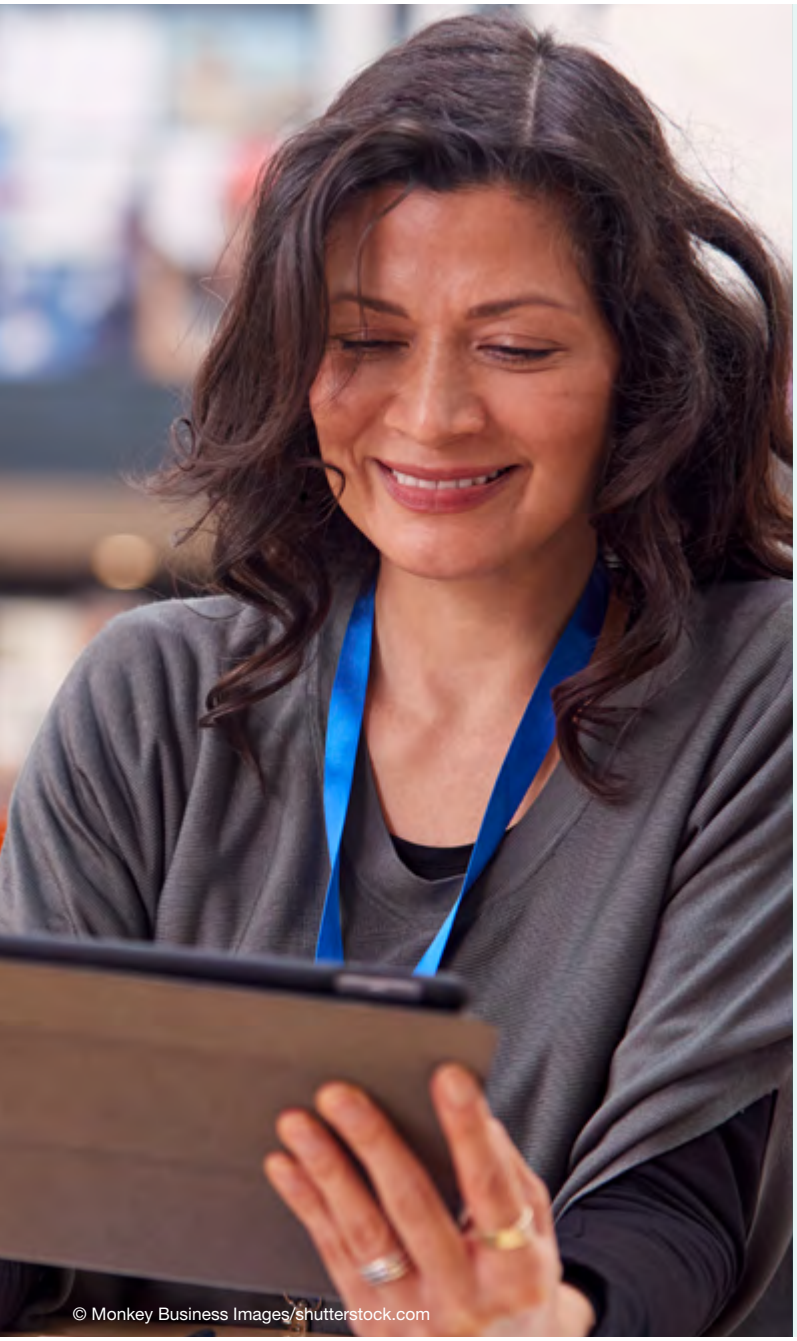
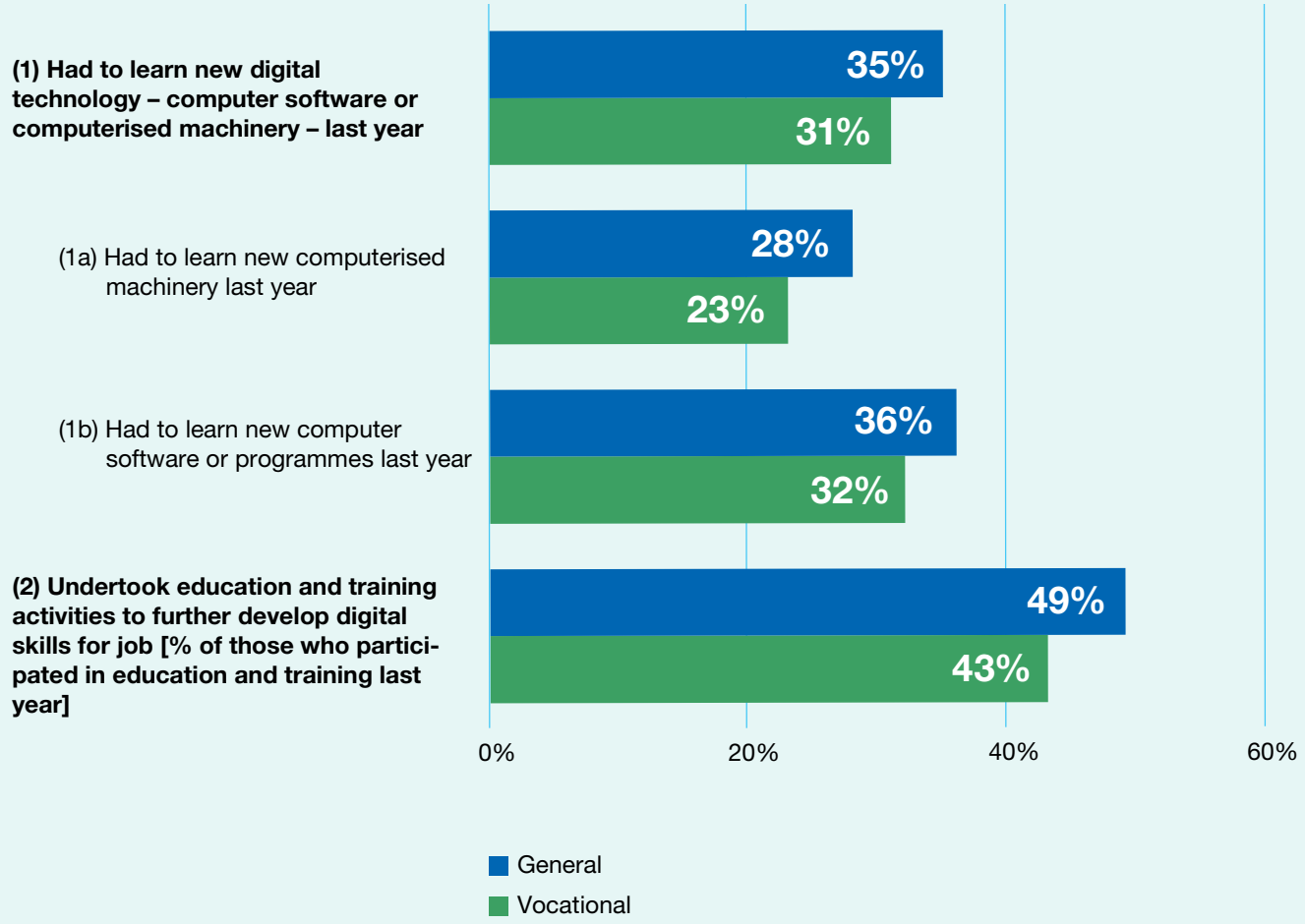


Figure 4. Digital upskilling by programme orientation



NB: Sample of upper secondary and post-secondary, non-tertiary, graduates. Weighted data.

Source: ESJS2 (Cedefop).

Labour market sorting drives the digital disadvantage of VET

Workers with a VET background face a double digital disadvantage: employment in less digitally intensive jobs and lower participation in digital upskilling. This is concerning, as both stand in the way of continuing digital skills formation during their career. The fact that workers with a VET qualification are more likely to be employed in jobs that are a good match with their education can amplify their digital skills gap because it reduces motivation to engage in further learning.

A good match is therefore not necessarily a desirable outcome from a skills development point of view. It is mostly driven by lower skills and learning needs, as many vocationally educated workers are in jobs less exposed to technological change and where tasks do not change frequently (Neuber-Pohl et al., forthcoming). Such jobs also rely less on workers who carry out tasks requiring higher foundation skills.

Understanding why the jobs typically held by workers with a VET background are less digitally intensive requires going beyond individual attributes of workers. Cedefop analysis shows that the lower digital intensity of VET jobs is largely driven by sectoral and occupational choices and circumstances. People with a VET background are more

...**workers with a VET background face a double disadvantage**: employment in less digitally intensive jobs and lower participation in digital upskilling...

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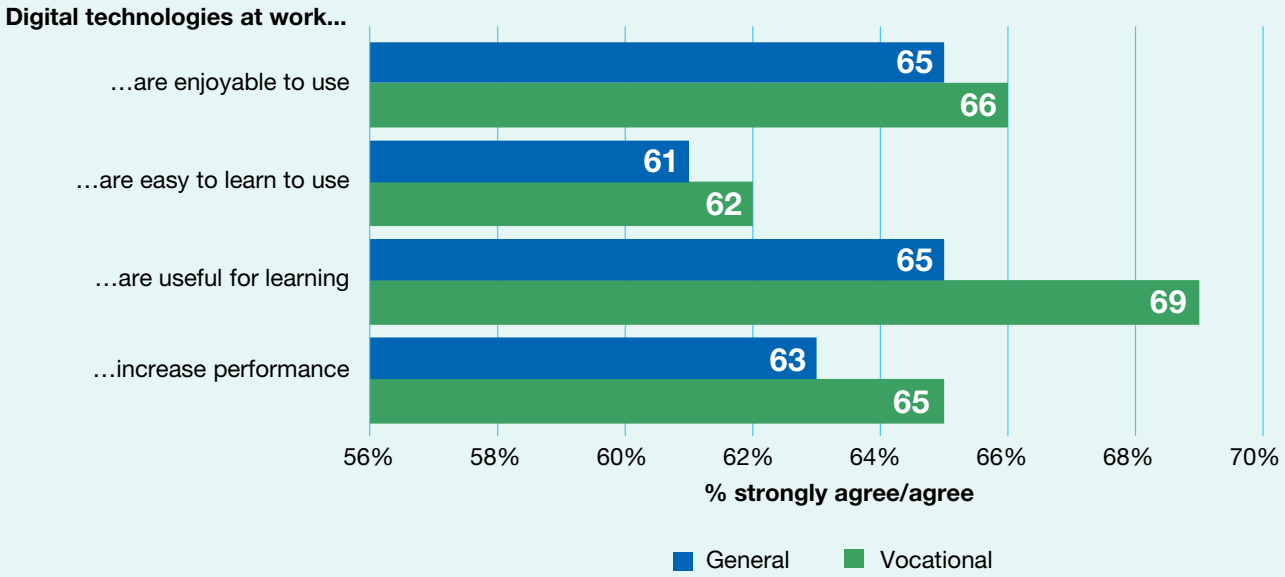
likely to end up in manufacturing, construction, human health and social work and other less digitally intensive sectors. They are also more likely to be employed in less digital occupations such as craft and related trades, and plant and machine operators, compared to workers who are similar in many other respects but completed general education.

Earlier research has suggested that the lower continuing learning of VET workers can be linked to the negative learning attitudes they have, compared to workers with general education (Verhaest and Omey, 2013). It is sometimes posited that such negative attitudes are driven by the more limited opportunities workers with a VET background have to build foundational learning skills in early education, compared to their general education counterparts. Cedefop's ESJS2 shows that the lower digital learning of workers with a VET qualification is much more linked to the low skill level of their job. In fact, 2 out of 3 workers with a VET background are positive about the value of digital technology for work (Figure 5). The attitudes of VET workers are comparable or even slightly more favourable compared to those with a general education background.

Figure 5. **Attitudes towards digital technologies by programme orientation**



NB: Online sample of upper secondary and post-secondary, non-tertiary, graduates. Weighted data.
Source: ESJS2 (Cedefop).

Graduates from strong dual VET need more support in digital upskilling

Tobback et al. (2024) used Cedefop's first European Skills and Jobs Survey to show that workers with a qualification containing a workplace-based component engage less in on-the-job learning in their early career than their counterparts with a qualification from a general education programme. Such negative effects are more pronounced in countries with well-developed dual systems. The authors attribute such effects to the emphasis on foundational, field-specific theories and concepts in school-based education programmes, which builds learning capacity and can translate into more learning later in life. Recent ESJS2 evidence corroborates such findings in the context of digitalisation. Adult workers with a VET background in countries with strong dual education systems ([4]) are particularly less likely to engage in further digital skills training.

([4]) We follow convention by viewing Austria, Denmark, Germany and Luxembourg as countries with 'traditional' dual educational systems (Verhaest et al., 2018).

...workers with a qualification containing a workplace-based component **engage less in on-the-job learning in their early career**...

...this is because these programmes place less emphasis on **foundational, field-specific theories and concepts**...

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Going digital in VET for better labour market outcomes

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VET enables young learners to take up relatively well-matching jobs and contributes to job satisfaction and perceived job security. These positive labour market outcomes are not accompanied by higher earnings. On average, workers with a VET background experience a 4% pay penalty compared to similar workers with general education. The pay disadvantage typically unfolds in early and mid-career phases and is more visible in jobs that require high-level digital skills (Table 1). This suggests that workers with vocational education cannot fully keep up with new digital technology in European labour markets.

Workers with a VET background who can nevertheless deal with high digital intensity tasks are more likely to enjoy positive labour market outcomes compared to their VET counterparts in low digital jobs. Those who graduated from VET and work in highly digital jobs earn 23% more compared to similarly vocationally educated workers who carry out low-skilled digital tasks in their job. Half of this substantial wage premium can be explained by the advanced complementary skillset digital intensive jobs typically require and other valuable job traits and working conditions associated with them. Even after correcting for such effects (e.g. employer tenure, public/private sector, workplace size), VET graduates using advanced digital technologies at work are still generously compensated with 13% extra pay for their ability to deploy them.

Successfully completing a VET programme can also elevate the labour market outcomes relative to comparable individuals who consider leaving lower secondary level education or training early. A medium-educated worker with a VET qualification has a 9% higher probability of being employed in a high-skilled digital job compared to an otherwise similar worker with only lower secondary education. Workers with a VET background are also 10% less likely to be non-users of computing devices. Deciding to embark on vocational studies and not drop out of school before starting upper secondary education elevates earnings by 3% on average.

...**workers with a VET background** experience a **4% pay penalty** compared to similar workers with general education...

...but VET graduates **using advanced digital technologies** at work earn **23% higher pay** compared to similar workers in low digital jobs...

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Table 1. **More digital VET can improve labour market prospects**

	DIGITAL SKILLS INTENSITY OF JOB		NET HOURLY WAGES	
	VET v general (1)	VET v lower secondary (2)	VET v general (3)	VET graduates (4)
Non-user	2%**	– 10%***	– 2%	[reference]
Low	1%**	– 4%***	– 1%	11%***
Medium	– 1%**	5%***	– 5%***	17%***
High	– 2%**	9%***	– 7%**	23%***

NB: Columns (1) and (2) show the marginal effects of ordered probit regressions of the digital skill intensity of jobs (gender, age and country dummies are independent variables). Columns (3) and (4) show the estimated coefficients of a Mincer-type log hourly wage regressions (where gender, age, age squared, and country dummies are regressors).
**significance level at 5%;
*** significance level at 1%. Weighted data.
Source: ESJS2 (Cedefop).

POLICY ACTION

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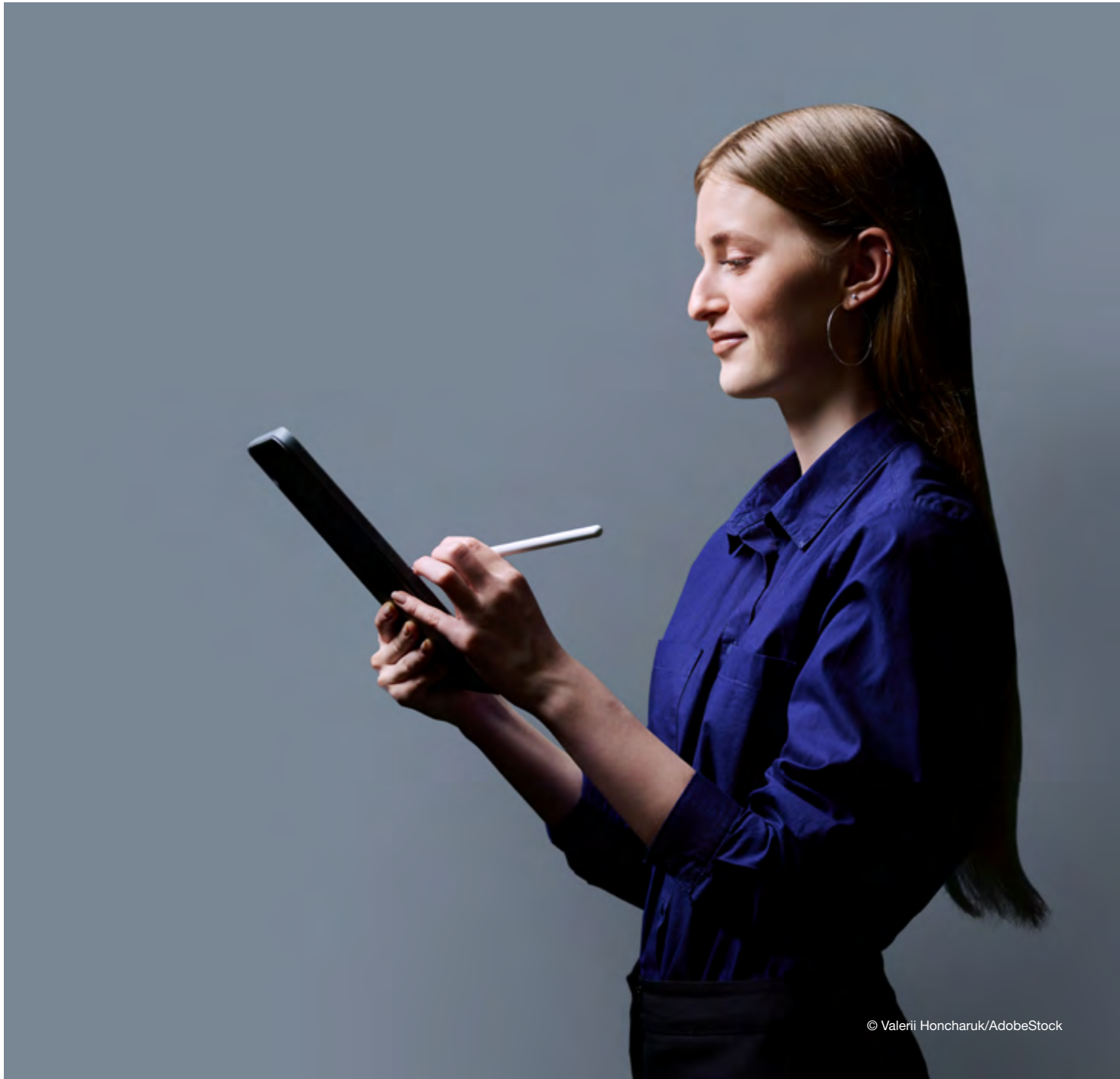
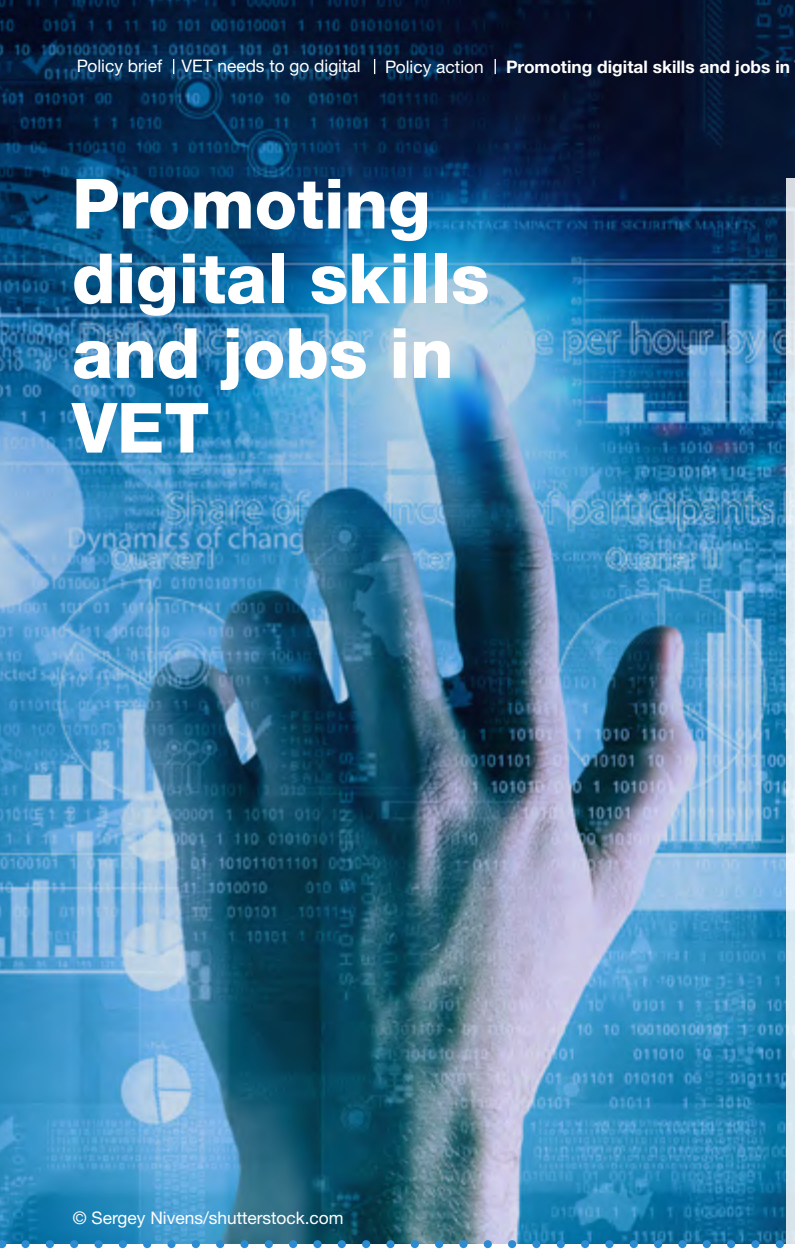


Promoting digital skills and jobs in VET



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EU Member States have taken a diverse array of VET measures to adapt to digitalisation and the challenges it entails, and some were taken before the COVID-19 pandemic hit (Box 3). Promoting digital competences in initial and continuing VET has been an overarching ambition in EU and national policy. Many initiatives promoting the digital transition are being developed (Figure 6).

Cedefop's ESJS2 findings underline the importance of renewed emphasis on the digital skills revolution in initial vocational education and training (IVET). More digital IVET better prepares learners for the world of work and lays the foundations of inclusive and effective continuing learning later in careers. The finding that European workers with a VET background are disadvantaged in terms of their capacity to continuously invest in their digital skills is concerning.

Ensuring that VET graduates can access digitally intensive jobs and remain productive should be a priority for VET policy implementation. Policy measures should prioritise sectors and occupations where the digital intensity of jobs of VET graduates is low. These include craft and related trades or professional jobs, and jobs in mining, manufacturing, electricity and gas, construction and transport.

Cedefop's ESJS2 also identifies subgroups among workers with a VET background who would greatly benefit from more participation in digital skills training. This includes private sector employees, workers in small or medium-sized enterprises and those who are employed in manual jobs.

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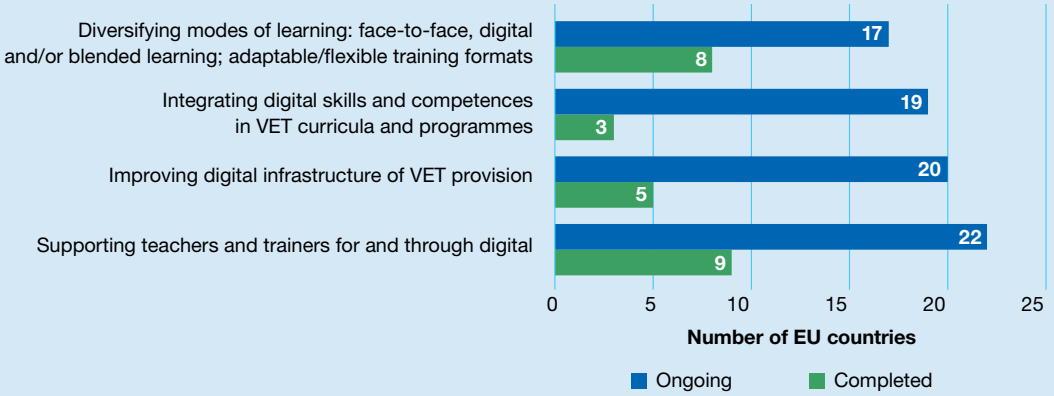
...ensuring that **VET graduates can access digitally intensive jobs** and remain productive should be a **priority** for **VET policy implementation**...

Figure 6. **EU countries planning VET measures promoting the digital transition**



NB: 'Ongoing' consists of the following stages of development: approved/agreed, pilot and implementation. Numbers based on the monitoring of VET measures related to the digital transition in 2022.

Source: Based on data provided by Cedefop (2023b).

Box 3. **EU Member States' VET measures in response to the future of work**

- Introducing new competences in VET, such as digital/media literacy, digital citizenship, coding/AI skills, algorithmic thinking, e-ethics, data protection and business informatics.
- Adapting learning outcomes/occupational standards to better reflect new digital skill demands in professions.
- Strengthening the interdisciplinarity of educational curricula and modularisation of VET programmes (e.g. based on the principle of STEAM (science, technology, engineering, arts, maths) or 'information skills' (a blend of creativity, communication, critical thinking and technology skills)).
- Focusing on blended learning, namely on how school education can support the use of a blend of learning tools (digital and non-digital) and environments including school sites, the workplace and outside spaces.
- Introducing or modernising training/apprenticeship programmes and training regulations in accordance with new digital transformation requirements.
- Monitoring and developing the digital skills of teachers, trainers and school administrators.
- Increasing the use of distance or e-learning via new digital technologies and digital solutions.
- Using new digital competence assessment models for teachers and trainers and in exams.
- Modernising IT infrastructure in educational institutions (including digitisation and concentration of learning resources).
- Fostering partnerships between education and training and workplace stakeholders to ensure regular updating of skill needs due to advancing digitalisation.
- Providing support to businesses and in particular small and medium-sized enterprises to accelerate their digital transformation.
- Developing or improving skills intelligence (e.g. use of big data and other skills anticipation methods to monitor skill needs across sectors/occupations).

Source: VET for the future of work (Cedefop).

Towards integrated and holistic digital skills policy

Digital skills and jobs challenges require actions that cross the boundaries between traditional policy areas and governance models. A focus on integrated policies that target digital competences in IVET from multiple directions and perspectives (e.g. a combination of strategic policy documents and action plans to modernise programme delivery, assessment and teacher training) is key. Digital skills policy in IVET also needs to foster the development of a digital culture across diverse learner populations, to forge stronger links between the VET system and the labour market, and to invest in the responsible, inclusive and ethical use of AI and other digital technology by VET schools, teachers, learners and other skills ecosystems stakeholders (Figure 7).

...**digital skills and jobs challenges require actions** that cross the boundaries between traditional policy areas and governance models...

...a **focus on integrated policies** that target **digital competences in IVET** from multiple directions and perspectives is key...

...**digital skills policy in IVET** also needs to **foster learning** a **digital culture,** strengthen **links with the labour market,** and **invest in ethical AI**...

Figure 7. **Challenges for EU digital skills policy**

1 DIGITAL CULTURE
- Develop digital culture across all ages.
- Bridge gap in digital business culture.
- Raise awareness of digital tech impacts.

2 DIGITAL STRATEGIES & LAWS
- Fragmented policy landscape, esp. IVET vs CVET.
- Need supportive, partnership-driven legislation.
- Lack of time for national strategy execution.

3 VET SYSTEM & LABOUR MARKET
- Varying authority levels for digital action.
- ICT integration complexity; digital access divide.
- Enterprise involvement challenges in VET.
- Centralised systems hinder curriculum updates.

4 TEACHING INFRASTRUCTURE
- Schools lack digital infrastructure & connectivity.
- High internet costs; unreliable equipment.
- Inadequate physical spaces for digital learning.

5 VET CURRICULA & QUALIFICATIONS
- Need new, flexible qualifications for digital skills.
- Overcome VET system inertia.

6 TEACHER DEVELOPMENT
- Address teacher shortages.
- Enhance teacher ICT capacity and motivation.
- Integrate digital tech in learning.

7 TEACHING TOOLS & SUPPORT
- Insufficient digital materials and support.
- Lack of digital initiatives overview at schools.

8 SKILLS INTELLIGENCE
- Address ICT specialist shortage.
- Close learners' digital skills gap.
- Encourage female participation in STE(A)M.

9 STUDENT LEARNING & HEALTH
- Overuse of ICT limits creativity.
- Distance learning impacts mental health.
- Inclusion challenges for vulnerable learners.

10 ETHICS
- Risk of public education system privatisation.

Source: Cedefop's input to the Council Recommendation on improving the provision of digital skills in education and training.

Improving digital skills of VET teachers and trainers

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As well-qualified teachers and trainers play a vital role in boosting the digital competence of VET learners (Pouliakas et al., 2023), their continuing professional development (CPD) in digital skills requires close attention. ESJS2 analysis shows more than 6 in 10 (63%) teaching professionals had to learn to use new digital technologies to perform their tasks after the pandemic hit (Figure 8). Before the pandemic, differences between EU countries were significant, ranging from 9 out of 10 teachers using digital technologies in Denmark, to only 3 out of 10 in Belgium (OECD, 2019). These marked differences were not only the result of the quality of the digital infrastructure of schools. They can also be linked to the finding that for about half of all EU teachers, digital competence only recently became part of their CPD.

In some countries VET teachers and trainers are not sufficiently prepared for the challenges of digitalisation, as many mandatory or soft-coordinated CPD programmes do not require teachers to acquire digital competences. Teachers are often expected to engage with CPD themselves to improve their digital competence level. To understand better what teachers need and to gain insight into how CPD can support this, Cedefop will launch a dedicated European Vocational Teacher Survey in 2025 (Box 4).

ESJS2 shows that VET teachers are less likely to engage in any training and that they participate less in digital skills training compared to other teaching professionals. VET teachers are also less inclined to think their digital skillset needs to be further developed so that they can do a better job. This signals how important it is to raise awareness about the potential of new digital technologies and pedagogies.

The number of policies, measures and projects has ballooned since the COVID-19 pandemic and it has rapidly accelerated the use of digital tools and platforms by VET teachers and trainers (Pouliakas et al., 2023). Government support provided during the pandemic should be consolidated and emergency programmes streamlined into sustainable, quality and accessible CPD opportunities. Such action would help VET teachers and trainers develop digital skills and mindsets for digital inclusion, so that they can effectively prepare all learners for a digital world of work and pursue and benefit from AI-supported innovation in teaching and learning.

...ESJS2 evidence shows that **VET teachers participate less in digital skills training** compared to other teaching professionals...

...to understand **what teachers need** and to **gain insight into how CPD** can **support this**, Cedefop has launched a new **European Vocational Teacher Survey in 2025**...

...**government support** provided during the pandemic should be consolidated and programmes **streamlined** into quality and accessible **CPD opportunities for VET teachers and trainers**...


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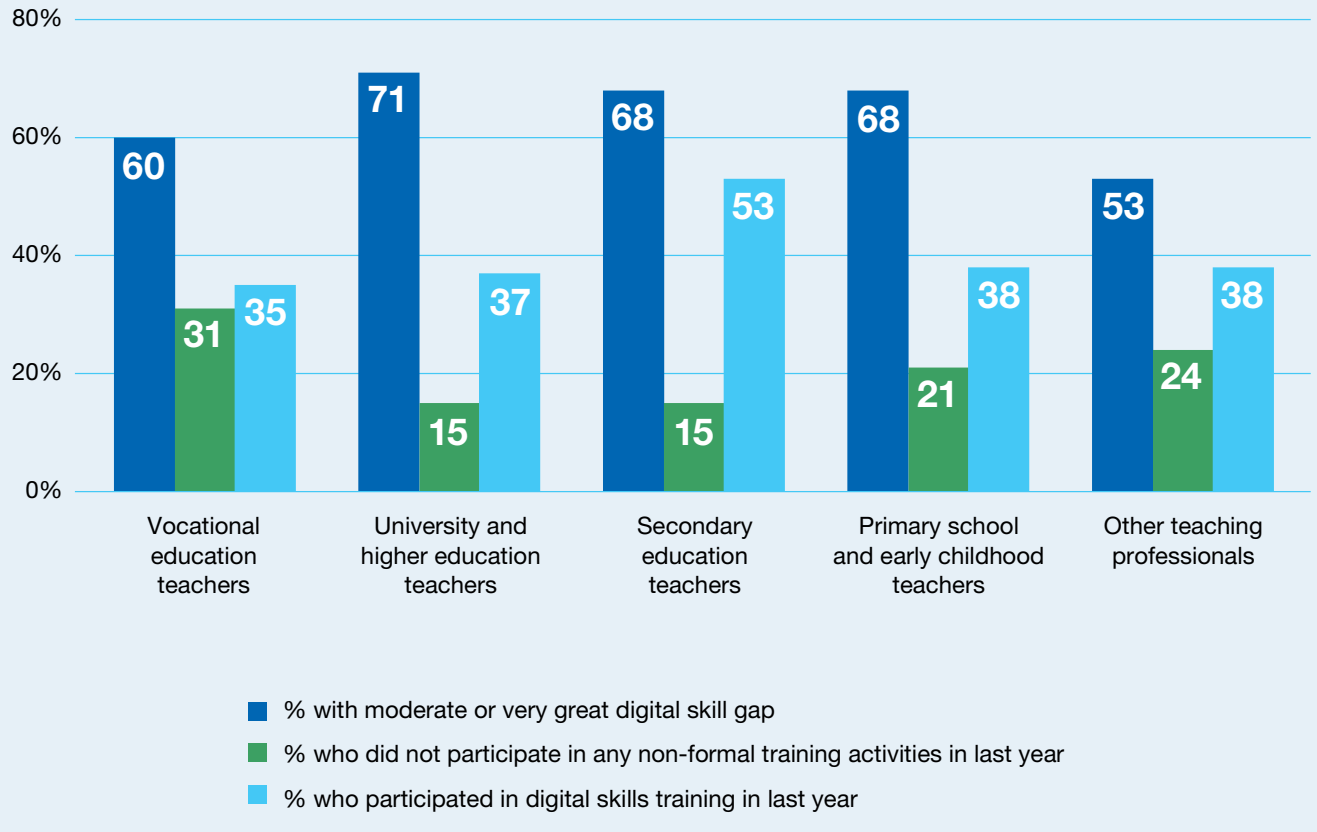
Figure 8. **Digital skills training and digital skill gaps of teaching professionals, EU+**



NB: Digital skill gaps are based on the ESJS2 question 'To what extent do you need to further develop your computer/IT skills to do your main job even better?'. Digital skills training data are derived by asking those who participated in any formal or non-formal educational or training activity in the last year whether at least one activity was done to further develop computer/IT skills needed for the job. Weighted data.

Source: ESJS2 (Cedefop).

Box 4. **Cedefop launches the European Vocational Teacher Survey**

To understand better what drives teachers' CPD and its effectiveness in improving their teaching, Cedefop has launched the European Vocational Teacher Survey, which will be fielded in the 2025-26 academic year.

The survey will provide new internationally comparable evidence on the opportunities, experiences, challenges and contextual factors affecting the CPD of representative samples of teachers working in IVET schools at International Standard Classification of Education level 3 in EU Member States. It will map VET teachers' learning needs and their participation in different types of CPD. The survey also will help to provide insights into the factors driving VET teachers' participation in CPD and its potential to improve their skills and teaching performance.

Source: European Vocational Teacher Survey.

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POLICY BRIEF

VET needs to go digital:
Upgrading the backbone of Europe's twin transition

Vocational education and training (VET) systems are a vital driver of the European twin transition. It is challenging for VET learners to keep up with the increasing demands of digital economies and societies.

This policy brief uses Cedefop's second European Skills and Jobs Survey (ESJS2) to make a case for a renewed digital skills revolution in VET. The findings it presents point towards the disadvantage workers with a VET background have in terms of their capacity to continuously invest in their digital skills. The brief underlines that digital skills policy in VET and its implementation must be inclusive, connect different policy areas and have a strong focus on the continuing professional development of VET teachers and trainers.

Project info: Skills and work

Project contacts:
Cedefop expert – Ralph Hippe
Cedefop expert – Konstantinos Pouliakas
Cedefop department coordinator – Jasper van Loo

CEDEFOP | European Centre for the Development of Vocational Training

Europe 123, Thessaloniki (Pylea), GREECE
Postal address: Cedefop service post, 57001 Thermi, GREECE
Tel. +30 2310490111, Fax +30 2310490020, Email: info@cedefop.europa.eu

visit our portal **www.cedefop.europa.eu**

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