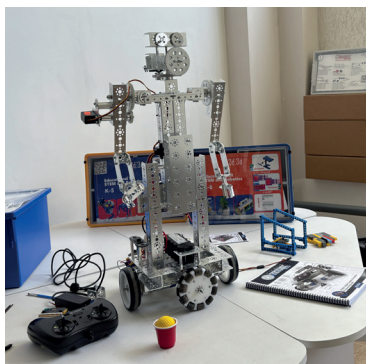


THE DIGITALIZATION APPROACH STRATEGY FOR VET EDUCATION





Skills4Recovery

This resource was developed as part of the project "Empowering VET Education: A Systematic Approach through Digital Competencies Training and Educational Technology Curriculum Development" is being implemented by the NGO Mondo within the framework of the Multi Donor Initiative Skills4Recovery, which is jointly co-financed by the European Union, Germany, Poland, Estonia, and Denmark, and is implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Solidarity Fund PL (SFPL).

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FOREWORD

In December 2024, Estonian NGO Mondo started a project “Empowering VET Education: A Systematic Approach through Digital Competencies Training and Educational Technology Curriculum Development” in Ukraine. Together with 45 VET institutions across Ukraine, the objective of the project was twofold: while strengthening the digitalisation of VET education through trainings for VET teachers and managers, the project also sought for ways to promote digitalisation through knowledge sharing and policy advice. The latter – promoting digitalisation through policy advice – has also brought us the current strategy: Digitalization Approach Strategy for VET Education.

The purpose of the Digitalization Approach Strategy for VET Education is to provide VET institutions with understanding on the importance of digitalisation of VET education together with tools and directions on how to implement it within an institution.

The Digitalization Approach Strategy for VET Education provides readers with an analytical overview of the current context of Ukraine: labour market needs, VET education in Ukraine and the digitalisation in the context of national reforms, strategies and policies. With the analytical overview, we offer readers an insight into why the development of VET education and digitalisation has become one of the key elements in rebuilding Ukraine. This is followed by some of the best practices and examples outside Ukraine, with a focus on both strategic level as well as specific examples of software programs and apps in use. In addition, the experience of Estonia in digitalisation of education is described as well. As Estonia is known for high digitalisation and good quality education, their experience offers a valuable learning opportunity for those planning and implementing their digitalisation in education – on the national as well as the institutional level.

To make sure that the experiences, needs and expectations of those working in the field of VET education in Ukraine are heard and taken into account, we also have included an overview of the needs and opportunities among VET managers and teachers. As it is the managers of VET institutions and teachers who implement the digitalisation of VET education, their involvement becomes especially crucial, as this allows us to create strategies and policies that do address the needs of those in the field. In the final chapter, policy recommendations are presented. The policy recommendations are based on all the previous chapters and are built on the current context of Ukraine and the experiences of those working in the field of VET education. Yet, as digitalisation of VET education does not rely solely on the institutions, the national level is also addressed in the policy recommendations.

The reader will also find a brief overview and description of the projects' main activities and outcomes – it is done to give those in the field of VET education a food for thought on how and why to point one's attention to digitalising education within their institutions.

This strategy can serve those who design or implement and evaluate the digitalisation of education well, especially on the institutional level (managers of educational institutions, educational officials from the local government, teachers, educators, and others). While the current strategy focuses strongly on the VET education, most of the challenges and opportunities, as well as policy recommendations, are transferable to every level of education and type of educational institution. In addition, as some of the policy recommendations are addressed to the national level, state representatives, decision- and policy-makers will find the strategy useful when planning state-level policies, strategies and reforms.

This strategy is inseparable from all the current reform processes taking place in vocational education. The creation of this document was made possible by the Multi Donor Initiative Skills4Recovery. This text is grounded in approaches that align with the initiative's overarching values: a timely yet thorough response to challenges; a focus on the most vulnerable groups; an attempt to bring together key stakeholders in the field of vocational education and training in a meaningful way; and an emphasis on both practical skills and institutional solutions, amongst other things.

We do hope that the strategy serves the needs of many – those working in the VET institution, in local governments as well as on a national level, designing and implementing policies and strategies. We invite you to use this strategy as a guide or a blueprint, to reflect on it from your unique perspective and try to implement the policy recommendations as is fit in your everyday work.



Team Mondo

1. THE CONTEXT OF UKRAINE

In order to understand the economic, political and strategical importance of vocational education and training (VET) in Ukraine, it is important to understand the context the VET is placed in Ukraine. For that, the following will provide an overview of the current context of VET education in Ukraine, taking into account the effects the full-scale war has made on VET education, as well as the latest reforms in the field of VET education.

1.1. LABOUR MARKET NEEDS AND WORKFORCE OF UKRAINE

The past years have been challenging Ukraine's education system, starting from COVID-19 pandemic and continuing with resistance towards Russia's full-scale invasion. Challenges that the prior years have presented to Ukraine's education system are hard to underestimate – whether it is the rapid shift to online education or continuing to provide education under martial law and in the context of war. This is accompanied by educational reforms and policies (e.g. ongoing “Modern vocational education and training”¹ reform) together with new strategies (e.g. “Digital Education Action Plan 2021–2027”) all shaping the way education is understood and provided across Ukraine. The near future adds to the new challenges, especially in VET education.

As of February 2026, there are 3.7 million internally displaced persons (IDPs)², resulting in mismatch between IDPs skills and available opportunities for professional life in their new region, exacerbated by the economic disparities throughout Ukraine. Due to the war, many businesses, productions and factories have been destroyed, leaving once skilled workers in search for new outputs for their professional life. At the same time, a skilled workforce to facilitate the country's stabilisation and recovery is much needed. There is already a demand

¹ Cabinet of Ministers of Ukraine Order. (2019). On approval of the Concept of implementation of state policy in the field of professional (vocational) education “Modern professional (vocational) education” for the period up to 2027. <https://zakon.rada.gov.ua/laws/show/419-2019-%D1%80#Text>

² UNCHR. (2026). Emergencies. Ukraine Emergency. <https://www.unrefugees.org/emergencies/ukraine/>

among construction-related workforce as well as in agriculture and this demand will only increase during the recovery period of Ukraine³. As of 2025, the deficit in construction labour was more than 37%⁴. It is the industrial sector facing the most acute workforce shortage⁵. Over half of young people are working in jobs unrelated to their area of expertise⁶, illustrating well the mismatch between available skills and labour market needs. Ukrainian global innovation strategy 2030 marks this mismatch between the work force skills and market requirements as one of the main barriers to innovation⁷, undermining Ukraine's innovation potential. This mismatch is accompanied by the decline of the workforce due to the expanded active-duty personnel in the Ukrainian Army, as well as 5.8 million Ukrainians (as of November 2025)⁸ who have moved abroad due to the war. A need for retraining gains even more importance when veterans return from the Ukrainian Army and seek new professions in civic life. These changes in population and labour market place a great challenge to VET institutions across Ukraine, emphasising once more the importance of VET education.

The military aggression of the Russian Federation against Ukraine has brought significant losses for the vocational education system: destruction and damage of institutions and equipment, loss of personnel and potential students and teachers and the breakdown of existing cooperation with businesses, communities and institutions.⁹ In February 2025, out of a total of 665 VET institutions, 183 were either damaged severely (171 counting for 27,9%) or destroyed completely (12 institutions). Still, VET institutions have illustrated strong resilience and stability. This has been considered due to the "rapid adaption of national legislation at the onset of the full-scale invasion" in addition to the experiences from COVID-19 pandemic, allowing it to continue providing education remotely. Professions related to the defence sector gained popularity, stimulating interest in related vocational programs.¹⁰

³ Ukraine Plan 2024–2027. <https://www.ukrainefacility.me.gov.ua/wp-content/uploads/2024/03/ukraine-facility-plan.pdf>

⁴ State Employment Service. (2025). Difficulties in recruitment in 2025. <https://dcz.gov.ua/stat/statsurvey>

⁵ Bevziuk, D., Shymanskyi, V., Rybak, O. (2026). Who do I want to be when I grow up? Career expectations of Ukrainian teenagers and their mismatch with the contemporary labour market. <https://voxukraine.org/en/who-do-i-want-to-be-when-i-grow-up-career-expectations-of-ukrainian-teenagers-and-their-mismatch-with-the-contemporary-labor-market>

⁶ Yatsenko, L. (2023). Youth Segment of the Labour Market in Ukraine During the Full-Scale War. National Institute for Strategic Studies. <https://niss.gov.ua/news/komentari-ekspertiv/molodizhnyy-sehment-rynku-pratsi-ukrayiny-v-period-povnomasshtabnoyi-viyny>

⁷ Ministry of Digital Transformation of Ukraine. (2026). Ukrainian global innovation strategy 2030. <https://winwin.gov.ua/en>

⁸ UNCHR. (2025). Ukraine Refugee Situation. <https://data.unhcr.org/en/situations/ukraine>

⁹ Ministry of Education and Science. Strategic Action Plan of the Ministry of Education and Science of Ukraine by 2027. <https://mon.gov.ua/en/the-strategic-action-plan-of-the-moes-by-2027>

¹⁰ Melnyk, S., Lytvynchuk, A. (2025). Development of the Vocational Education and Training System in Extreme Conditions: the Case of Ukraine. <https://doi.org/10.5281/zenodo.15379138>

Due to full-scale war, more traditional previously family roles have been broken and are undergoing a change – while men are in the army, women are taking more responsibility often while being IDPs themselves. To balance the labour market, it has been suggested that women should be encouraged to play a greater role in technical jobs – thereby breaking stereotypes and supporting women to take up jobs in sectors such as construction, transport, and energy¹¹. However, this would require retraining or further training, which is what vocational education can offer.

1.2. VET SCHOOLS IN UKRAINE

VET education in Ukraine serves several purposes, as is highlighted by the Ministry of Education and Science¹². VET education supports individuals in their right to obtain a profession while VET education provides Ukraine's economy with skilled and competitive workers simultaneously. In addition, VET education is seen as contributing to the implementation of government employment policy and VET education ensures conditions for the functioning and development of vocational training institutions across all forms of ownership and governance.



Photo from a monitoring visit to the Pervomaiske Vocational College

¹¹ Helvetas. (2025). Labour Market Assessment 2024–2025: Business demand, challenges, strategy for impact. <https://www.helvetas.org/Publications-PDFs/Eastern-Europe-Caucasus/Ukraine/Social%20Housing%20Reform%20in%20Ukraine/Labor%20Market%20Assessment%202024-2025%20Business%20Demand,%20Challenges,%20Strategy%20For%20Impact-ENG.pdf>

¹² Ministry of Education and Science. (2026). Vocational Education and Training. <https://mon.gov.ua/en/tag/vocational-education-and-training?tag=vocational-education-and-training>

There are three levels of vocational education and training provided in Ukraine:

1. first as initial training;
2. second as basic training;
3. third, a higher level¹³.

While the first and initial training level focuses on VET-related needs of people with no secondary education, the second level (basic training) is the most widespread and can be entered either after completing 9th or 11th grade (accordingly 14–15 years and 16–18 years). When enrolling after the 9th grade, the program is three to four years, including full secondary education in addition to vocational qualifications. When enrolling after graduating 11th grade, the program lasts one to two years. The third level addresses the needs of upskilling and reskilling, serving the needs of adults. Aligned with the European Qualification Framework (EQF), the levels correspond to 2nd, 3rd, 4th and 5th level.¹⁴

In 2024, there were 653 VET institutions (pre-higher institutions not included) in Ukraine. Geographically, Dnipropetrovsk region had 57 institutions, Lviv region 51 and Donetsk region 41. The number of VET students has been decreasing from 250 336 in 2021 to 214 395 in 2024. A similar pattern can also be found among the teaching staff of VET institutions with 33 534 teachers in 2019 and 27 201 teachers in 2024.¹⁵ Understandably, some of the institutions have been destroyed or damaged, while others operate in occupied areas, resulting also in the decrease of the VET institutions. Yet, the decreasing number of VET institutions also reflect the efforts of the Ministry of Education and Science in reforming the VET education in Ukraine.

1.2.1. REFORMS IN VET EDUCATION

In 2019, with the adoption of the Concept of implementing state policy in the field of vocational education, a reform “**Modern Vocational Education and Training**” began. The adoption of the Concept of implementing state policy in the field of vocational education serves three core objectives:

- decentralizing of management and funding in VET, shifting governance of most VET institutions to regional authorities;
- ensuring the quality of education in vocational education and training;
- establishing public-private partnerships in vocational education and training and improving the accordance with the labour market.

¹³ Eurydice. (2025). Ukraine. Organisation of the education system and of its structure. <https://eurydice.eacea.ec.europa.eu/euryperia/ukraine/organisation-education-system-and-its-structure>

¹⁴ Leu-Severynenko, S. (2022). Vocational education and training in Ukraine: A System in Transition. <https://www.govet.international/en/159632.php#:~:text=Image>

¹⁵ State Statistics Service of Ukraine. (2026). Data Bank. <https://stat.gov.ua/en/explorer?md5=e70bb852b97a8acb2f3ab9e34fc91530>

The reform is carried out in three stages between 2019–2027¹⁶.

Starting from 2019, partnership with the European Union and programs like EU4Skills have also brought support for the VET reform. EU4Skills (58 million euros) program brought new modern equipment for the VET institutions together with developing new online courses and teacher upskilling.¹⁷

The full-scale invasion of Ukraine by the Russian Federation has brought emergency measures in the VET system. Amendments to the legislation simplified licensing for procedures of VET programs and provision was introduced allowing students to suspend their studies as a result of disruption caused by the martial law. The amendments to the legislation have also "contributed to reducing unemployment and ensured rapid retraining for those who lost their jobs due to the war".¹⁸

In 2025, the focus of reforms in VET was on improving the legislation together with the materials and technical base. In addition, emphasis was placed on aligning students' skill provision with the needs of the labour market. VET institutions also provided the much-needed rapid re-skilling that is important for a post-war economy. Strong focus has also been on digital competences and embedding IT solutions both into teaching and learning.¹⁹ **The Law on Vocational Education** was adopted in 2025 and the access to 390 million euros in support from the EU was gained. The law stands for the autonomy of vocational colleges, both financial and administrative and in cooperation with businesses improving the educational content. In addition, the Law presents independent knowledge assessments in qualification centres.²⁰ The Law on Vocational Education also introduces performance indicators to professionalise the management of the VET institutions. To improve the quality of the training provided in VETs, graduates of these institutions are faced with an external assessment of their learning outcomes, carried out by independent qualification centres.²¹

As a result of the reform, the flexibility and responsiveness of VET institutions have been already improved, resulting in VET institutions becoming more agile in adapting programmes to local labour market needs, launching new high-demand training areas.²²

¹⁶ Ministry of Education and Science. (2026). Strategic Action Plan of the Ministry of Education and Science of Ukraine by 2027. <https://mon.gov.ua/en/the-strategic-action-plan-of-the-moes-by-2027>

¹⁷ Eurydice. (2026). Ukraine. National reforms in vocational education and training. <https://eurydice.eacea.ec.europa.eu/euryperia/ukraine/national-reforms-vocational-education-and-training>

¹⁸ Eurydice. (2026). Ukraine. National reforms in vocational education and training. <https://eurydice.eacea.ec.europa.eu/euryperia/ukraine/national-reforms-vocational-education-and-training>

¹⁹ Eurydice. (2026). National reforms in vocational education and training. <https://eurydice.eacea.ec.europa.eu/euryperia/ukraine/national-reforms-vocational-education-and-training>

²⁰ Government Portal. (2025). Ylia Svrydenko: Adoption of the Law On Vocational Education paves the way for modernisation and European integration of the education system. <https://www.kmu.gov.ua/en/news/yulia-svrydenko-ukhvalennia-zakonu-pro-profesiinu-osvitu-vidkryvaie-shliakh-do-modernizatsii-ta-ievrointehratsii-osvitnoi-systemy>

²¹ Ministry of Education and Science of Ukraine. (2025). The Law "On vocational education" was signed. <https://mon.gov.ua/news/pidpysano-zakon-pro-profesiinu-osvitu>

²² Melnyk, S., Lytvynchuk, A. (2025). Development of the Vocational Education and Training System in Extreme Conditions: the Case of Ukraine. <https://doi.org/10.5281/zenodo.15379138>

1.3. DIGITALISATION AND DIGITAL COMPETENCES IN POLICIES

The need for digital competences is well echoed on the policy-making level as several policies, strategies emphasise the importance of digitalisation and digital competences. **The Law of Ukraine** highlights information and communication competence as a key competence. **The concept of development of the digital economy and society of Ukraine for 2018–2020** states that "the primary tasks are the formation of a thorough national policy of digitization of education as a priority component of the education reform"²³. In 2021, the **Concept of development of digital competencies and approval of the plan of measures for its implementation** was approved by the Cabinet of Ministers of Ukraine's Order²⁴. The concept stands for creating legislation and framework for digital competences, as well as for the requirements for employees (professional standards). In addition, the concept calls for coordination on the development of digital competences between the executive authorities. The Ministry of Education and Science of Ukraine is working to establish a digital education ecosystem.²⁵

New Ukrainian School emphasizes that integrating ICT in the education sector should move beyond isolated initiatives and become a comprehensive process covering all dimensions.²⁶ In VET education, digital competences of learners are emphasised in addition to the integration of IT solutions regarding teaching and learning²⁷.

On the European Union level, **Digital Education Action Plan 2021–2027** was adopted in 2020 to "foster quality and inclusive digital learning" and to "future-proof Europe's education system"²⁸. This also serves as a framework or a point of reference to Ukraine's reforms in education.

²³ Cabinet of Ministers of Ukraine Order. (2018). On approval of the Concept of development of digital economy and society of Ukraine for 2018–2020 and approval of the action plan for its implementation. <https://zakon.rada.gov.ua/laws/show/67-2018-%D1%80#n13>

²⁴ Cabinet of Ministers of Ukraine Order. (2021). On approval of the Concept of development of digital competencies and approval of the plan of measures for its implementation. <https://zakon.rada.gov.ua/laws/show/167-2021-%D1%80#Text>

²⁵ Eurydice. (2025). Ukraine: Digital transformation of education as a strategic path to resilience and innovation. <https://eurydice.eacea.ec.europa.eu/news/ukraine-digital-transformation-education-strategic-path-resilience-and-innovation>

²⁶ UNESCO. (2024). Ukraine. Education technology legislative and policy framework. <https://education-profiles.org/europe-and-northern-america/ukraine/~technology#2.1>

²⁷ Eurydice. (2025). Ukraine. National reforms in vocational education and training. <https://eurydice.eacea.ec.europa.eu/euryperia/ukraine/national-reforms-vocational-education-and-training>

²⁸ European Commission. (2025). Digital Education Action Plan. <https://education.ec.europa.eu/focus-topics/digital-education/plan>

2. PRACTICES OF DIGITALISING VOCATIONAL EDUCATION

Ukraine in its approach to digitalise vocational education and training is not a unique phenomenon in and of itself. Digitalisation of vocational education has been increasingly a central theme in educational reforms worldwide²⁹. Traditionally, VET education has been focusing on practical, technical skills that match a specific profession. Nowadays, more emphasis is put on general competences to provide learners with more transferable skills. This includes digital skills and digital literacy.³⁰

2.1. ANALYSIS OF DIGITALISATION OF EDUCATION

OECD³¹ analysed policies regarding digitalisation of education in OECD countries and half of the OECD countries have put in place a dedicated strategy in digital education that lay out their political perspectives on how digital innovation can enhance learning, as well as challenge it.

In the OECD analysis, several similarities can be found among the digital education strategies created. One of the similarities among the policies was the **importance of ICT infrastructure**, including high-speed internet as well as the devices available. This is also related with digital innovation as the latter acquires better connectivity and devices, and therefore serves the interests of the "Strategy for the development of innovation activities for the period up to 2030". Although some education strategies also offer the "bring your own device" policy, this should not be the main approach or method on having access to digital education – this could result in widening of the gap between students with digital devices and those without them.

²⁹ Diao, J., Tang, X., Ding, X. (2025). How do nations around the world navigate the digitalization of vocational education policies? *Education and Information Technologies*, 30, 19803–19831. DOI: <https://doi.org/10.1007/s10639-025-13567-9>

³⁰ Cedefop (2023). The future of vocational education and training in Europe: synthesis report. Luxembourg: Publications Office. Cedefop reference series; No 125. <http://data.europa.eu/doi/10.2801/08824>

³¹ OECD. (2020). Digital strategies in education across OECD countries: exploring education policies on digital technologies. OECD Education Working Paper No. 226. https://www.oecd.org/content/dam/oecd/en/publications/reports/2020/09/digital-strategies-in-education-across-oecd-countries_a140ba61/33dd4c26-en.pdf

Another commonality among the policies is the emphasis that is placed on the **role of teachers**. As OECD describes: "there is a continuous risk that investments in digital technologies have no return or even prove ineffective for education, if the technologies are not (proficiently) used in class" (p.17). To tackle this, various measures have been implemented to mitigate this risk. Yet, the challenge here is twofold: while professional competences of teachers need to be clarified, there is also a need for the support of professional development.

In addition to teachers' competences, the **preparation of students** for life in the digital age is also addressed in several digital education strategies. This is well reflected on the digital education strategies of OECD countries, as "most OECD countries have placed 'digital literacy' on their agenda" (p.19). This aligns well with the key priority of the European Commission – building the digital competence and skills needed for the digital transformation.

Inclusion and equality is another aspect relevant in the digital education strategies. While digitalisation creates opportunities in education, it also creates risks and challenges. The inequality becomes visible, when considering that there are those who are skilful users of digital technologies or have at least an opportunity for a proper training and education, and there are those without sufficient level of skills and knowledge to use digital technologies. This gap between those with access and skills and those without them is referred to as the digital divide. As is known from the literature, social inequalities are amplified by the digital divide while disparities that already exist in the social realm emphasise the digital divide^{32,33,34}. It is education that is considered as the "great equaliser" when it comes to reducing inequalities and providing access to ICT and skills needed to use ICT^{35,36}. That is why the role of teachers is crucial to develop their students' digital literacy.

The strategies analysed by OECD mostly reflect on concerns around **privacy and security**. Addressing these concerns varies depending on the country. "The digital strategy of Estonia designates security-by-design and privacy-by-design as principles for the development of digital services and IT" while in Norway "implementing measures for better information security and privacy in basic

³² Linnea, L., Kamuf, V., Heleniak, T., Weck, S., Norlén, G. (2021). Can digitalization be a tool to overcome spatial injustice in sparsely populated regions? The cases of Digital Västerbotten (Sweden) and Smart Country Side (Germany). *European Planning Studies*. 30. 1–18. <https://www.tandfonline.com/doi/full/10.1080/09654313.2021.1928053>

³³ Notten, N., Becker, B. (2017). Early home literacy and adolescents' online reading behavior in comparative perspective. *Int. J. Comp. Sociol.*, 58, 475–493. <https://journals.sagepub.com/doi/10.1177/0020715217735362>

³⁴ Cheshmehzangi, A.; Zou, T.; Su, Z.; Tang, T. The growing digital divide in education among primary and secondary children during the COVID-19 pandemic: An overview of social exclusion and education equality issues. *J. Hum. Behav. Soc. Environ.* 2022, 33, 434–449. <https://www.tandfonline.com/doi/full/10.1080/10911359.2022.2062515>

³⁵ Ragnedda, M.; Ruiu, M.L.; Addeo, F. (2022). The self-reinforcing effect of digital and social exclusion: The inequality loop. *Telemat. Inform.* 72, 101852. <https://www.tandfonline.com/doi/full/10.1080/10911359.2022.2062515>

³⁶ Fiel, J.E. (2020). Great Equalizer or Great Selector? Reconsidering Education as a Moderator of Intergenerational Transmissions. *Sociol. Educ.* 2020, 93, 353–371. <https://journals.sagepub.com/doi/abs/10.1177/0038040720927886>

education are part of the action plan". In addition, the United Kingdom "has published a data protection toolkit to guide schools through key data protection activity"³⁷.

As the study carried out by European Union's Joint Research Centre, the University of Seville describes that there are two major trends necessary for a VET to have a successful digital transformation: (1) Digital technology integration into teaching and learning methods; (2) emphasising holistic development of skills (including digital literacy) from digital skills specific approaches.³⁸

In addition, the study mapped out preliminary results on the key elements of the successful digital transformation:

KEY ELEMENTS FROM THE LITERATURE REVIEW	KEY ELEMENTS FROM THE PRACTICE
Development and use of information systems	Targeted needs and flexibility
Digital skills for VET teachers and trainers	Time relevance & use of state-of-the-art technologies
Digital skills for students	Collaboration
Development of socioemotional & transversal skills	Communication, awareness & adoption
Transformative potential of blended and online learning (including experiential methods)	Continuous improvement and monitoring
Flexible accreditation mechanism	Continuous professional development
Incorporation of emerging technologies	Scalability & sustainability
Digital technologies in career education and guidance	
Promotion of the link between sustainable human development and technologies use	
Tackling technology related gender gaps in VET	
Ecological & strategic approach in VET	
Changes of role of practitioners due to ICT	
Use of digital resources	

Table 1. Overview of the key elements for a successful digital transformation. Source: Herrero et al. (2024).

³⁷ OECD. (2020). Digital strategies in education across OECD countries: exploring education policies on digital technologies. OECD Education Working Paper No. 226. https://www.oecd.org/en/publications/digital-strategies-in-education-across-oecd-countries_33dd4c26-en.html

³⁸ Herrero, C., Villar Onrubia, D., Cosgrove, J., Kluzer, S., Centeno, C., Castaño Muñoz, J., Romero Rodríguez, S., Moreno Morilla, C., Weikert Garcia, L., Arroyo Sagasta, A., Zubizarreta Pagalday, D., Wisniewski, D., Fabe, N. (2024). Digital Transformation of VET. Herrero, C. (editor). Publications Office of the European Union, Luxembourg. <https://publications.jrc.ec.europa.eu/repository/handle/JRC138603>

When looking at the changes in VET education regarding digitalisation, there is an increase in **digitised assessment approaches**. Digitised assessment approaches can be found both in formative and summative assessment, but also when validating formal and non-formal learning. On one hand, digital assessment assumes some level of digital skills from both the learners and teachers. On the other hand, it also helps teachers to save time and use more complex assignments (e.g. adding videos for the assignment etc.).³⁹

2.2. BEST PRACTICES IN DEVELOPING THE DIGITAL COMPETENCES OF TEACHERS AND STUDENTS

On one hand, different digital platforms and software may be quite useful to tackle issues such as geographic disparities or the relevance of VET education in everyday working life. On the other hand, all of these solutions assume some level of digital competencies and literacy. Digital competences become more important in all fields of life, emphasising the importance of education in preparing students for life in the digital era. While VET education has its own characteristics and specificity, many digital education practices could be implemented at different educational levels. What follows are some of the best digital education practices in the EU⁴⁰ that offer value for VET education – both teachers, students and VET institution managements.

Aimed for everyone, including students and teachers, **France** is using an online public digital platform Pix to assess, develop and certify digital skills to develop digital literacy. The platform accessible to everyone assesses, improves and certifies digital skills in five areas: information and data literacy, communication, content creation, safety and problem-solving. With the ability to create a personalised learning path, it has been integrated into the education system in France and is broadly used in schools. A similar solution is also in practice in **Ireland**, where a platform was used to promote the upskilling of the workforce in regard to digital literacy. The national skills platform allows its users to assess their skills, recognise their shortcomings and take up a personalised learning path to strengthen their skills and knowledge. In addition, the platform serves to match individual skills and knowledge in regard to their digital skills with a suitable role in the workforce.

³⁹ Cedefop (2023). The future of vocational education and training in Europe: synthesis report. Luxembourg: Publications Office. Cedefop reference series; No 125. <http://data.europa.eu/doi/10.2801/08824>

⁴⁰ European Commission: European Education and Culture Executive Agency. (2025). Driving digital transformation in education – *Innovative practices from the EU*, Curaj, A.(editor) and Hâj, C.(editor), Publications Office of the European Union. <https://data.europa.eu/doi/10.2797/9398200>

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In Austria, DigiLernSicher project brought interactive learning methods together with gamification to vocational education by using extended reality (XR⁴²). More specifically, XR was used to train electrical engineering apprentices and simulate situations that might potentially be dangerous, offering a safe opportunity to train for realistic situations. This allowed apprentices to develop an understanding of the threats, risks and potential harm in the field of electrical engineering, while still enhancing their self-directed learning and learning path.

In Cyprus, a digital platform was created to bring together VET students with industry professionals to offer digital mentoring and traineeship for VET students. While this helps to align the VET education more with the needs of the entrepreneurs and working professionals, it also helps in overcoming challenges of geographic locations of students, VET institutions and industry entrepreneurs. This way, students of both rural and urban areas have access to real-world experiences of working life.

A similar example can be found **in the Netherlands**, where the initiative Katapult sought to tighten the link between education and the labour market by promoting public-private partnerships that help ensure students develop the skills employers need, ultimately boosting their employability.

⁴¹ European Commission: European Education and Culture Executive Agency. (2025). *Driving digital transformation in education – Innovative practices from the EU*. Curaj, A.(editor) and Hâj, C.(editor), Publications Office of the European Union. <https://data.europa.eu/doi/10.2797/9398200>

⁴² Extended reality (XR) is an umbrella term that encompasses virtual, augmented and mixed realities. See more: [https://www.edps.europa.eu/data-protection/technology-monitoring/techsonar/extended-reality_en#:~:text=Extended%20reality%20\(XR\)%20is%20an,environment%20or%20experience%20for%20users](https://www.edps.europa.eu/data-protection/technology-monitoring/techsonar/extended-reality_en#:~:text=Extended%20reality%20(XR)%20is%20an,environment%20or%20experience%20for%20users).

3. EDUCATION IN ESTONIA

With top-results in PISA (#1 in Europe)⁴³, Estonian education system has gained a lot of attention globally. Estonia's comprehensive education system is divided into general education (preschool, basic education and upper-secondary education), vocational education and higher education⁴⁴. Starting from the academic year 2025/2026, the obligation to study applies until turning 18-years old or until obtaining vocational or upper secondary education. Before, the obligation to study applied until turning 17-years old or until obtaining basic education.⁴⁵

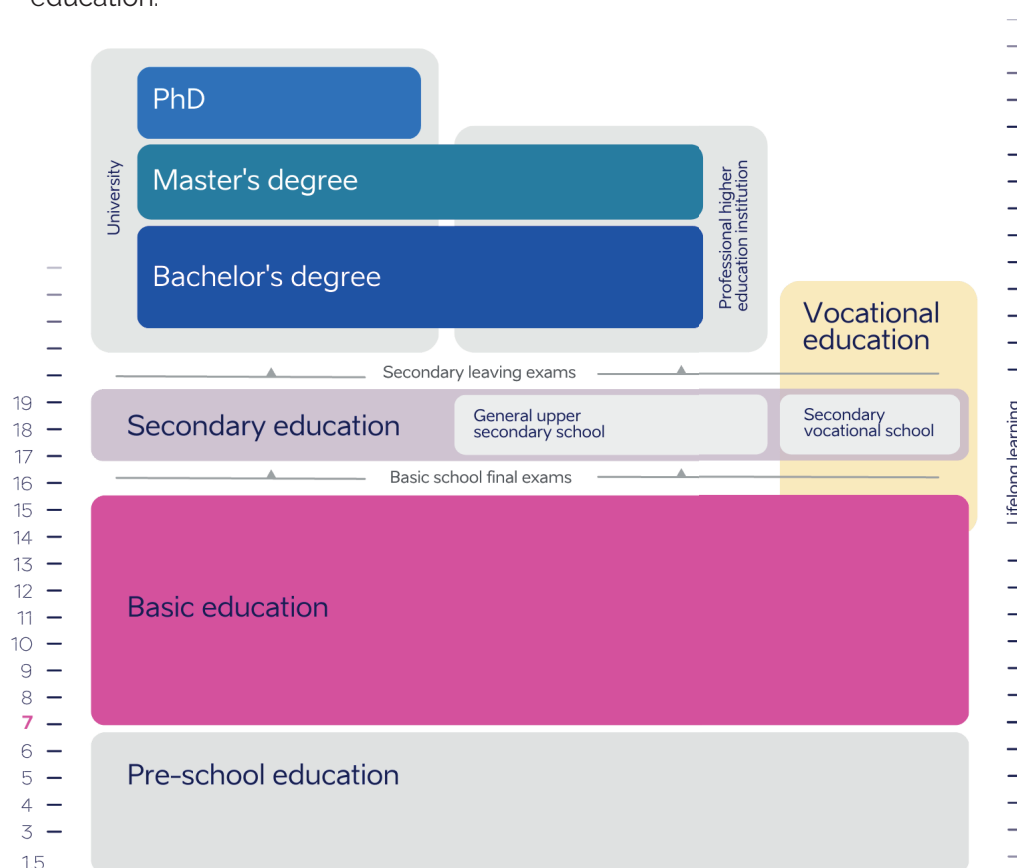


Figure 1. Estonian education system. Source: Education Estonia⁴⁶.

⁴³ Ministry of Education and Research. (2024). PISA. <https://www.hm.ee/en/ministry/statistics-and-analysis/pisa>

⁴⁴ Eisenschmidt, E., Heidmets, M., Kitsing, M., Kasesalk, M., Vanari, K. (2023). Aim High and Work Hard. Building a World-Class Learning System in Estonia. Washington, DC: National Center on Education and the Economy. <https://www.educationestonia.org/wp-content/uploads/2023/12/AimHighEstoniaCaseStudy.pdf>

⁴⁵ Ministry of Education and Research. (2026). Põhiharidus. <https://www.hm.ee/uldharidus-ja-noored/alus-pohi-ja-keskharidus/pohiharidus>

⁴⁶ Education Estonia. (2025). Estonian education system. <https://www.educationestonia.org/about-education-system/>

There are several core strengths to recognise in the Estonian education system. One of them being that **quality education** is available for most, if not everyone. Although those with higher socio-economic status outperformed those with lower socio-economic status, this difference between those two groups remains smaller than is the average across OECD countries⁴⁷. Yet, the latest Estonian Human Development Report 2026 highlights that the educational gap is widening and the data illustrates that schools, where the proportion of families with social support and benefits is higher, are systematically performing worse⁴⁸. At the same time, among PISA countries, Estonia has one of the lowest percentage of students attending private schools, as majority of students go to public schools⁴⁹. The latter illustrates well the trust society in general has placed on the Estonian education system.

Schools in Estonia have a **high level of autonomy** and while management and teaching staff of educational institutions shape and manage their own teaching practices and school culture, they also enjoy the high level of trust placed on them by the public⁵⁰. While the national curriculum defines *what* needs to be achieved, it is up to institutions to decide *how* this will be achieved. On the institutional level, objectives and focuses of the studies is set, directors of the institutions hold the power of selecting their staff, budgeting and evaluate the needs for trainings and teachers are responsible for choosing their methods and learning materials⁵¹.

In addition, the strengths of Estonian schools lie in the **professionalism** of teachers and educational institutions managers, **curriculum development** as well as the **digital capacity**. Moreover, Estonia has an experience in reforming all levels of education.⁵²

⁴⁷ OECD. (2023). PISA. Pisa 2022 results. Factsheets. Estonia. https://www.oecd.org/en/publications/pisa-results-2022-volume-iii-factsheets_041a90f1-en/estonia_9e8b79ea-en.html

⁴⁸ Kindsiko, E. (toim) 2026. Eesti inimarengu aruanne 2026. Haridus ühiskonna peeglis. Tallinn: SA Eesti Koostöö Kogu. 2026. Retrieved from: <https://2026.inimareng.ee/sissejuhatus/>

⁴⁹ OECD. (2026). Education GPS. Estonia. Student performance (PISA 2022). <https://gpseducation.oecd.org/CountryProfile?plotter=h5&primaryCountry=EST&threshold=5&topic=PI>

⁵⁰ Eisenschmidt, E. Heidmets, M., Kasesalk M., Kitsing, M., and Vanari K. (2023). Aim High and Work Hard: Building a World-Class Education System in Estonia. Washington, DC: National Center on Education and the Economy. <https://www.educationestonia.org/wp-content/uploads/2023/12/AimHighEstoniaCaseStudy.pdf>

⁵¹ Education Estonia. (2025). Estonian education system. <https://www.educationestonia.org/about-education-system/>

⁵² Allemann, M., Mägi, E., Tinn, M. (2026). Inspiratsioon, mitte koopia: Eesti võimalused haridusvaldkonna arengukoostöös. Tallinn: SA Mõttekoda Praxis. https://estdev.ee/sites/default/files/2026-02/uuringu_lopparuanne_haridusvaldkonna_arengukoostoo_praxis.pdf

3.1. VET EDUCATION IN ESTONIA

In the academic year 2025/2026, there were more than 27 000⁵³ students enrolled in 30 vocational education institutions. Out of the 30 institutions, 25 are state owned, 2 are owned by the local government and 3 are privately owned.⁵⁴ The majority (76,5% in 2024) of students enrolled in vocational education, continued their education after compulsory basic education (up until 9th grade)⁵⁵.

Since Estonia regained its independence, vocational education has been undergoing several reforms (e.g. to modernize its curricula, optimize educational networks and to create regional vocational education centres)^{56,57}.

The latest reform seeks ways to make vocational secondary education or applied secondary education equally attractive compared to upper secondary education. This allows students in vocational education or applied secondary education to continue their studies in higher education, as the reform strengthens the upper secondary education element in vocational education. According to the Ministry of Education and Science of Estonia, the reform addresses following issues:

- Vocational general education is currently not sufficiently supporting the development of general competences of students, which are necessary for the holistic development of the student and for successfully coping in life.
- Vocational secondary education is not an attractive choice for graduates of basic education, and by 2035, the goal is to have 40% of graduates of basic school will choose vocational secondary education.
- Currently, vocational secondary education provides insufficient general education preparation from the full scope of the curriculum for graduates to continue their studies on the next level of education. Therefore, the scope of general education studies increases more than twice in the new vocational secondary education model.
- There is no clear correspondence between OSKA's⁵⁸ sectoral labour demand forecasts and the number of free vocational study places created by the state.⁵⁹

⁵³ Ministry of Education and Research. (2025). Uus õppeaasta toon koolipinki ligikaudu 161 õpilast, 27 000 kutsekoolide õppurit ja 45 000 tudengit. <https://www.hm.ee/uudised/uus-oppeaasta-toob-koolipinki-ligikaudu-161-000-opilast-27-000-kutsekoolide-oppurit-ja-45>

⁵⁴ Eesti Hariduse Infosüsteem. (2026). <https://enda.ehis.ee/avalik/avalik/oppeasutus/OppeasutusOtsi.faces?sessionId=c0a8c8ca30d8bff39e65bcb444d4b91a964362e33001.e3ySaN8Ob38Le3mSchaPaxuNaiO>

⁵⁵ Statistics Estonia. (2026). Vocational Education. <https://stat.ee/en/find-statistics/statistics-theme/education/vocational-education>

⁵⁶ Estonian Education and Youth Board. (2025). Factsheet. Vocational Education and Training. Estonia. Estonian ENIC/NARIC. <https://harno.ee/sites/default/files/documents/2025-01/Kutseharidus.pdf>

⁵⁷ Education Estonia. (2026). Vocational education and training. <https://www.educationestonia.org/vet/>

⁵⁸ Conducted by Estonian Qualifications Authority, OSKA provides forecasts and analysis on the need of labour market in Estonia. See more at: <https://oska.kutsekoda.ee/en/>

⁵⁹ Ministry of Education and Research. (2026). Kutsehariduse reform. <https://www.hm.ee/kutsehariduse-reform>

3.2. DIGITALISATION OF EDUCATION IN ESTONIA

The Estonian education system has been **developing its digitalisation** since the mid 1990s. The first – **Tiger Leap Program** started in 1996, and by 2001, all schools had computers and Internet access. Together with the devices and access to the Internet, came also ICT courses for teachers. The **role of educational technologist** was first introduced in Estonian schools in 2005⁶⁰. Educational technologists are seen as part of school staff members, whose role is to “coordinate activities in the field of digital learning, finding new innovative solutions, developing, advising and supporting the school staff and students in using the tools and opportunities of the digital age in the learning process”⁶¹. In 2012, **ProgeTiger** and **IT Academy** programs were launched. With the first one – ProgeTiger – robotics, STEAM subjects and programming was made available for students. IT Academy was launched to address the issue of lack of labour resources in the field of IT and to improve the competences of graduates in the field of IT.⁶² In 2025, Estonia announced another educational program with a focus on artificial intelligence (AI). **The AI-Leap** program provides both students and teachers with AI-based learning tools to promote integrating the capabilities and tools of AI into the education system. Starting with high-school students from grades 10–11, the program will be expanded to vocational education in the following year.⁶³

Digital competences are also part of general competences in national curricula^{64,65}, digital competences are taught across subjects and are therefore developed cross-disciplinary and interdisciplinary. Teachers' digital competences are guaranteed from three aspects:

- Professional standards for teachers⁶⁶
- In teacher education
- In a school environment (e.g. with the role of educational technologist)

In addition, Estonian Education and Youth Board has created **digital competence models** for teachers to use in order to evaluate both their and their students' competences as well as teach new critical digital skills⁶⁷.

⁶⁰ Lorenz, B., Kikkas, K., Laanpere, M. (2011). The Role of Educational Technologist in Implementing New Technologies at School. https://link.springer.com/chapter/10.1007/978-3-319-07485-6_29

⁶¹ The Estonian Association of Educational Technologists. (2026). Who is an educational technologist? <https://haridustehnoloogid.ee/eng/who-is-an-educational-technologist/>

⁶² Education Estonia. (2026). How it all began? From Tiger Leap to digital society. <https://www.educationestonia.org/tiger-leap/>

⁶³ Estonian Ministry of Education and Research. (2025). Estonia announces a groundbreaking national initiative: AI leap programme to bring AI tools to all schools. <https://www.hm.ee/en/news/estonia-announces-groundbreaking-national-initiative-ai-leap-programme-bring-ai-tools-all>

⁶⁴ Republic of Estonia Government. (2011). Põhikooli riiklik õppekava. <https://www.riigiteataja.ee/akt/129082014020?leiaKehtiv>

⁶⁵ Republic of Estonia Government. (2011). Gümnaasiumi riiklik õppekava. <https://www.riigiteataja.ee/akt/129082014021?leiaKehtiv>

⁶⁶ Estonian Qualifications Authority. (2026) Comparison of teacher professional standard. Retrieved from: <https://www.kutseregister.ee/ctrl/en/Standardid/vaata/11413152>

In the professional standard of teachers, including VET teachers, **digital pedagogy** has been added as an optional competence that teachers could include in their professional standard. This is in addition to the general and compulsory digital competencies included in the professional standards. In the digital pedagogy competence, one must illustrate performance indicators in:

- training and consulting (creation of materials for the use of digital tools, conducts training on the use of digital tools and etc.);
- designing learning environments (analysing existing digital infrastructure to propose its development and implementation in the learning processes, evaluates security threats and proposes ways to mitigate those risks);
- development activities (offers digital tools and the integration of digital competence into teaching to support and evaluate curriculum development).⁶⁸

Regardless of the fact that Estonia is known for its digitalisation and good quality education, there are also challenges and shortcomings in digitalising education in Estonia. While the data infrastructure in Estonia is world-class, it is still **underutilised** – whether it is because of barriers on data protection or due to a lack of data literacy⁶⁹. For example, the administrative register data that has already been gathered would have shown long ago that educational inequality is worsening. There is a need to apply Estonian register-based information much more vigorously in order to design targeted interventions to reduce the education gap.⁷⁰

Another challenge can be related to **digital learning materials**. As it is shown, digital learning content is largely created on the support of European funds, especially when it comes down to a very specific target group (e.g. students who are studying on simplified curriculum). While digital learning materials of good quality are often "behind a paywall", meaning you would have to buy yourself access to it, the materials available for free are in a varying quality and are not adaptable.⁷¹

⁶⁷ Estonian Ministry of Education and Research. (2020). Uued mudelid aitavad õpetajail hädavajalikke digipädevusi õpetada. <https://www.hm.ee/uudised/uued-mudelid-aitavad-opetajail-hadavajalikke-digipadevusi-opetada>

⁶⁸ SA Kutsekoda. (2026). Kompetentsid: digipädevuste rakendamine. <https://www.kutseregister.ee/ctrl/et/Kompetentsid/vaata/10822341>

⁶⁹ The Estonian Human Development Report. (2026). Haridus ühiskonna peeglis. Põhisõnumid. https://2026.inimareng.ee/wp-content/uploads/2026/02/EIA_pohisonumid.pdf

⁷⁰ Kindsiko, E., Roosaar, L. (2026). PISA-pimedus. Miks Eesti ei kasuta oma registriandmete potentsiaali? – E. Kindsiko (toim), Eesti inimarengu aruanne 2026. Haridus ühiskonna peeglis (lk 101–114). Eesti Koostöö Kogu. <https://2026.inimareng.ee/aruanne/hariduse-andmetarkus/pisa-pimedus-miks-eesti-ei-kasuta-oma-registriandmete-potentsiaali/>

⁷¹ Haugas, S., Kendrali, E., Kadarik, I., Kallip, K., Lauri, T., Lehari, M., Melesk, K., Mägi, E., Nuiamäe, M., Pöder, K., Teidla-Kunitsõn, G., Teppo, M., Toim, K. (2023). Ühtekuuluvuspoliitika fondide rakenduskava 2014–2020 prioriteetse suuna "Ühiskonna vajadustele vastav haridus ja hea ettevalmistus osalemaks tööturul" tulemuslikkuse ja mõju hindamine. Tallinn: Mõttekoda Praxis. https://www.praxis.ee/uploads/2023/10/UKP_rakenduskava_hindamine_Lopparuanne_Loppversioon.pdf

Vendor lock-in is another aspect to consider when planning and implementing digitalisation of education. Vendor lock-in refers to one's dependence on the products or services provided by the manufacturer through technological secrecy (closed, in-house and proprietary, patented standards, technical norms, specifications). Dependence is illustrated when switching to another provider would entail costs.⁷² A challenge with vendor lock-ins is versatile. On one hand, it is an economical challenge – with vendor lock-ins corporates can achieve a monopoly on the market and therefore manage their pricing more freely. On the other hand, it is also a problem of security, privacy and data protection.⁷³

⁷² HITSA. (2017). Soovitused IT-teenuste korraldamiseks. Üldhariduskoolide digitaristu kaasajastamine. <https://harno.ee/sites/default/files/documents/2021-06/Soovitused%20yldhariduskoolidele%20IT%20teenuste%20korraldamiseks.pdf>

⁷³ Kikkas, K., Saadjärv, R. (2026). Eesti haridussüsteem tehnoloogiliste ja juriidiliste muutuste tuules. – E. Kindsiko (toim), Eesti inimarengu aruanne 2026. Haridus ühiskonna peeglis (lk 238–246). Eesti Koostöö Kogu. <https://2026.inimareng.ee/aruanne/tarkvara-uuendatud-aga-kas-oppimine-ka/eesti-haridussusteem-tehnoloogiliste-ja-juriidiliste-muutuste-tuules/>

4. CURRENT CHALLENGES AND OPPORTUNITIES AMONG VET INSTITUTIONS – EXPERIENCED BY VET TEACHERS, MANAGERS AND LOCAL GOVERNMENT OFFICIALS

In addition to document analysis and reviewing existing literature, the experiences and understandings of VET teachers and VET institution managers were also gathered. This provides an understanding of the challenges and opportunities experienced by those working in VET in their everyday lives, that supplements the knowledge gained from the document analysis.

In order to take into account the experiences of VET teachers and managers of VET institutions, two different questionnaires were developed for each target group. The questionnaire focused on the current situation in relation to digitalisation of education, existing challenges and opportunities, as well as policies and funding opportunities in the field.

Overall, 120 people answered the questionnaire, providing valuable input for both understanding their everyday lives as well as for developing policy recommendations. Among respondents there were 100 VET teachers and 20 VET institution managers.

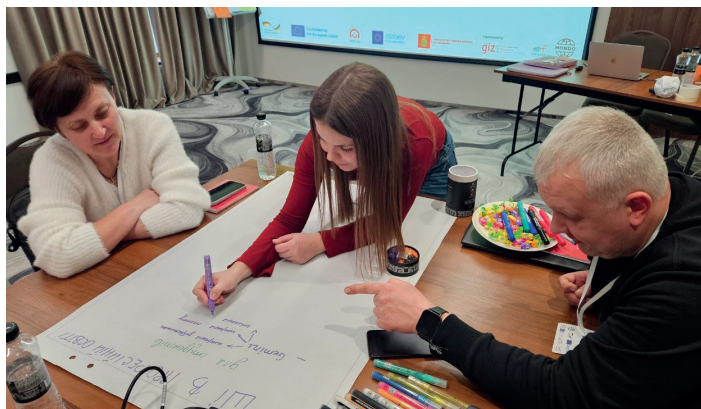


Photo from a training for teachers of vocational institutions

When VET teachers were asked what has enabled them to use digital technologies in their teaching activities, many different aspects were brought out. On one hand, there is a strong notion that the use of digital technologies is based on teachers' own motivation and initiative in learning and developing their competencies on their own.

“Own knowledge and skills, trainings and meetings with colleagues”.

VET teacher

In some cases, this results in using their own equipment and resources.

“I carry my own laptop; the software is what I paid for myself or pirated and accordingly without timely updates or with incomplete functionality”.

VET teacher

There are also cases among teachers, where the support from the management is recognised as an enabler in using digital technologies in the teaching and learning processes.

“Support from the institution's administration, training, communication with colleagues, enjoyment of using digital tools”.

VET teacher

When the VET managers were asked to describe the digitalisation of education in VET institutions, it concluded that the process of digitalisation varies greatly between institutions. On one hand, there are those emphasising that digitalisation places an important role in their institution and is considered a strategic development priority.

“Digitalization of education in our institution is considered a strategic development priority, which directly affects the quality of the educational process, the effectiveness of management and the readiness of education seekers for the modern labour market”.

VET manager

A priority or not, it does not mean that the process of digitalisation of education goes without challenges. As some of the VET managers described, their digitalisation of VET education has been going “*Below average*” or it has been “*Implemented gradually*”. Some challenges are posed by the reality of Ukraine and martial law:

“[Digitalisation] is a priority, however, due to resource shortages and problems in the energy system, a trend towards decrease in the level [of digitalisation] is observed”.

VET manager

4.1. SUPPORTING AND HINDERING FACTORS OF THE DIGITALISATION OF VET EDUCATION

When asked, what allows VET managers to use digital tools in their institutions, the respondents brought out several aspects, yet the main ones were skilful teachers, availability of equipment (hardware and software) and infrastructure (connection), but also students with a sufficient level of skills.

“The use of digital tools in our educational institution is possible due to the appropriate level of digital skills of teachers and students, the availability of technical support and access to the Internet, support from the Ministry of Education and Science of Ukraine project, as well as state and local programs aimed at the digitalisation of education”.

VET manager

When looking at the challenges in using digital technologies in teaching and learning, the answers from the teachers turned out to be somewhat similar.

THE OBSTACLES IN USING DIGITAL TECHNOLOGIES IN TEACHING	NUMBER OF TEACHERS WHO LISTED IT AS AN OBSTACLE OR A CHALLENGE
Challenges with infrastructure (lack of good quality and stable internet)	56 out of 100
Lack of devices available (laptops, tablets and etc)	51 out of 100
Lack of software available (programs, school management system etc)	51 out of 100
Lack of digital competence among students	40 out of 100
Overwhelming workload	35 out of 100
Lack of digital competence among teachers	29 out of 100

[...] the most urgent need in vocational education institutions today is access to modern technology and a stable internet. Without this, digital tools remain only “on paper”, not in real work. Practical training of teachers, not formal courses [...] Single convenient digital platforms [...] Digital educational materials close to real production [...] Support for students in developing digital skills. Not all education seekers are equally confident in working with technology – they need basic digital competencies for their future profession.

VET teacher

Least experienced obstacles described by teachers were lack of mutual understanding among colleagues regarding digitalising VET education (11 teachers out of 100) and lack of support from the management of institutions (4 teachers out of 100). In addition, 8 teachers said that they have not experienced any obstacles.

Challenges that VET managers are experiencing can be concluded in three main categories: instability of the infrastructure, lack of devices and software, and lack of educational materials.

“The biggest challenge today is the instability of the infrastructure. The constant threat of power outages and Internet outages often nullify all digital preparation for classes [...] Another “pain” is technical support. A significant part of digital learning relies on the personal equipment of teachers, because the college’s computer park needs a serious upgrade. The same applies to software.”

VET manager

“The main obstacle is the lack of specialised software and digital educational materials necessary for the implementation of professionally oriented training. The available resources do not always meet the modern requirements of the industries and the needs of educational programs. This limits the possibilities of full implementation of digital tools in the educational process and practical training of education seekers.”

VET manager

When discussing most pressing needs, VET managers highlight the need to update digital resources, implement digital management platforms, and improve the digital competencies of teachers and students.

“It is important to systematically improve the digital competencies of teachers and students, taking into account the needs of the labour market. Also relevant is the need for methodological support and the implementation of unified digital solutions for management and the educational process.”

VET manager

To conclude, teachers were asked to bring out what they would need in the future to be able to successfully use digital tools in their everyday work.

“To successfully use digital tools in my daily work, I need a stable technical infrastructure, access to modern technology and software, regular opportunities to improve my digital competencies, methodological support and exchange of experience with colleagues, as well as sufficient time and organizational support from management to integrate digital solutions into the learning process.”

VET teacher

“Support from management, understanding the importance of digitalization and creating conditions for implementing digital solutions without excessive workload play a big role.”

VET teacher

5. POLICY RECOMMENDATIONS

The following policy recommendations are derived from existing research and best practices, while also taking into account the needs and opportunities of VET institutions. While some recommendations are to be implemented on a national level, there are several suggestions for VET institutions to apply, as they are not entirely dependent on the national policies and investments. The recommendations are presented in a logical order, where achieving one goal (e.g. good-quality and high-speed connection to the internet) is a prerequisite for the second one (the use of devices and software); and the second one (access to devices and software) is a prerequisite for the third one (digitally competent teachers). Yet, these policy recommendations should be seen as a unified whole – ignoring one (e.g. developing infrastructure) results in the loss of opportunities to implement digitalisation in VET (teachers cannot implement their competences).

In addition, it is important to note that each institution has their own unique strengths that could be used in digitalising VET education. For example, many institutions are relying on the strong motivation of teachers. This resource – motivated teaching staff – when nurtured properly, could be an important indicator for success in digitalising VET education. Yet, one cannot solely rely on teachers' motivation, as it is not sustainable – both teachers and managers of VET institutions report an overwhelming workload. Other institutions might have close contacts with private sector entrepreneurs, together with whom they create the conditions for implementing digital solutions in the learning processes. Another example of a strength to build on would be a strong and capable management of an institution who could provide a systematic and sustainable approach to digitalisation within the institution.

While recognising these differences, a unified understanding among VET managers and teachers – currently the biggest challenges are related to a good infrastructure within VET institutions. Whether it is a problematic internet connection, lack of devices or software programs for teachers to use – all of these aspects call for investments both on national, regional and institutional level.

While the ongoing full-scale invasion of Russia continuously creates challenges for infrastructure, starting from power cuts etc, high-speed internet access, equipment and software is still needed when the war ends.

5.1.1. INVESTMENTS IN INFRASTRUCTURES TO PROVIDE VET INSTITUTIONS WITH GOOD QUALITY AND HIGH-SPEED INTERNET CONNECTION

For VET institutions to be able to practice the digitalisation of education, a good infrastructure of ICT is needed, as this is the prerequisite for using professional software and digital solutions in vocational training. Investment in developing the infrastructure of ICT in VET institutions aligns well with the practices in OECD countries (see chapter 2.1.), as well as with the Ukrainian “Strategy for the development of innovation activities for the period up to 2030”. The latter also states that the infrastructure needed for innovation is currently underdeveloped (see chapter 1.3.). Among the VET teachers, this is the main challenge they are facing when asked about challenges in using digital technologies in teaching and learning – a challenge that is also brought out by VET managers (see chapter 4.).

While high-speed and good connection to the Internet involves large investments and provides accessibility not only for the educational sectors, but also other sectors important to the state (e.g. businesses, public institutions, as well as citizens etc.), the implementation of these connections should be **led and funded largely by the state**. Often the investments in ICT infrastructure are rather a part of states' digital strategies⁷⁴, instead of educational strategies, as these infrastructures create opportunities across sectors (civic society, businesses, education, public services, etc.). In addition, providing good infrastructure in rural areas addresses the inequalities between rural and urban areas and promotes equal access to education.



Photo from a monitoring visit to the Nova Odesa Vocational College

⁷⁴ OECD.(2020). Digital strategies in education across OECD countries: exploring education policies on digital technologies. OECD Education Working Paper No. 226. Retrieved from: https://www.oecd.org/en/publications/digital-strategies-in-education-across-oecd-countries_33dd4c26-en.html

5.1.2. INVESTMENTS IN EQUIPMENT AND EDUCATIONAL ACCESS FOR VET INSTITUTIONS

In addition to good internet connectivity, devices, equipment and software availability creates an important part of the infrastructure of VET institutions. Without the devices and programs, it is difficult to talk about digitalisation of VET education. Next to challenging internet connectivity, lack of devices and software are the second and third most reported challenges of digitalisation of VET education among VET teachers (see chapter 4.). OECD analysis of policies regarding digitalisation of education emphasises well the importance of the ICT infrastructure, including devices (see chapter 2.1.).

Providing VET institutions with necessary equipment and software access could be carried out by different stakeholders and parties. This might include **support from the local governments, state programs, as well as the private sector and the VET institutions themselves** through prioritising budgeting, applying grants, etc. For example, private sector companies can provide or borrow their equipment for the VET institutions who prepare professionals to work in the field where the private companies act. This supports future-professionals to have an education and preparation for work-life more aligned with the realities of these professions and the companies hiring those professionals do not have to retrain them.

Here it is also important to note that providing VET institutions with equipment that is outdated, does not have the capacity to run demanding software and digital solutions, creates more challenges than offers a relief. In these cases, the devices cannot be trusted to work properly, challenging the lesson planning and learning processes. It is also important to not rely on students' personal devices. With the latter, it is a great danger to widen the digital divide, as students' opportunities obtaining these devices vary greatly, as the OECDs analysis illustrated. In addition, it challenges the equal access to education among students.

5.1.3. DEVELOPING TEACHERS' SKILLS AND COMPETENCIES

While good ICT infrastructure together with devices and software is a prerequisite for the use of digital technologies in teaching and learning, a skilful user of these tools is also needed. In the context of VET education, this involves teachers and other staff members in VET institutions, who also need to have digital competences in addition to their professional and pedagogical knowledge. Although digital competences are compulsory and present in the VET professional standard⁷⁵, these competencies require to be developed

⁷⁵ Ministry of Economic Development, Trade and Agriculture of Ukraine. (2020). https://register.nqa.gov.ua/uploads/O/169-1181_majster_virobnicogo_navcanna.pdf



*Photo from a training
for teachers of
vocational institutions*

continuously, as the digital world itself is developing day-by-day. Therefore, it is important to keep the knowledge and skills required for a purposeful use of digital technologies up to date among the staff of VET institutions.

The role of teachers in using technology proficiently in educational processes, is also echoed from the analysis of policies regarding digitalisation of education (see chapter 2.1.) as well as in the legislations and reforms shaping the educational field of Ukraine (see chapter 1.3.).

This responsibility should not fall only on teachers themselves, but institutions should provide support in developing one's digital competencies and provide teachers with learning opportunities.

According to OECD⁷⁶, there are different approaches to adopt when fostering digital competences development among teacher:

- In collaboration with related stakeholders, **revising the professional standards of teachers** in relation to digital competences to make sure that digital competences brought out in the professional standards are up to date and reflect the developments in the field of digitalisation of education. In addition, these professional standards should be enforced through **teacher education, certification and evaluation processes**.

⁷⁶ OECD (2023). OECD Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem, OECD Publishing, Paris. https://www.oecd.org/en/publications/oecd-digital-education-outlook-2023_c74f03de-en.html

- **Supporting teachers' participation and obtaining digital competences.** This includes creating opportunities for participating in relevant training as well as recognising digital competence development in career progression.
- **Creation of educational technologist's role** within the VET institution, as educational technologists can support teachers in obtaining digital competencies, support them in using new software and devices and provide them with necessary knowledge needed to successfully integrate digital solutions in their pedagogical work.
- In **collaboration with Centre of Excellence** that serve as "innovation implementation centres in VET"⁷⁷, creation of courses to elevate the digital competences of VET teachers.

5.1.4. CREATION OF DIGITAL LEARNING MATERIALS

Together with a good infrastructure (connectivity and devices with access to software) and digitally competent teachers, there is a need for digital learning materials. This involves online materials that teachers could use in their everyday teaching; and while very specific professions might require professional software that already includes necessary online materials, more general subjects lack these materials greatly. Therefore, more effort in creating those online learning materials is needed.

This recommendation could be implemented by different parties, including state as well as institutions themselves. For example, on a state level:

- **Creation of a repository** that would host online learning materials that teachers could search for and use. Important to note here is that while the search system itself should allow search of materials based on specific criteria (e.g. subject, age group, difficulty level), the materials uploaded in the repository should firstly have a good quality and secondly, they should be editable. This allows teachers to adapt the materials to their students' needs.
- On a national level, a **system could be developed for creating those online materials**. This could involve a motivational system for VET teachers to create their own materials and share them with others. This system can be carried out by the state or by grant schemes and procurements.
- Online learning materials do not have a long lifespan, as websites expire and online materials are often taken down etc. Therefore, there is a need for a **constant quality check** of the online materials available in the repository.

⁷⁷ Ministry of Education and Science. Strategic Action Plan of the Ministry of Education and Science of Ukraine by 2027. <https://mon.gov.ua/en/the-strategic-action-plan-of-the-moes-by-2027>

From an institutional perspective:

- Institutions should find a way to **motivate and acknowledge** the effort of teachers in creating online learning materials.
- Institutions could hold seminars, training and other events to develop the skill of teachers in creating their own online learning content.

5.1.5. SYSTEMISED AND SUSTAINABLE APPROACH TOWARDS DIGITALISATION OF VET EDUCATION ON INSTITUTIONAL LEVEL

Support from the management of the institution has been seen as an enabler of digitalisation in the field of VET education. Teachers value the support of administration and management and the conditions created to implement digital technologies. VET managers see management support in implementing digital initiatives and supporting the staff in doing so, as one enabler when it comes to digitalising VET education. In addition, as the feedback from project participants indicate, VET managers themselves find it important to have a strategy for the digitalisation of education within the institution (see chapter 6.1.). Yet, this should be done in a more systematic and sustainable way. For that, institutional measures could involve:



Photo from the international conference 'VET 2.0: Digital Skills and Management Solutions', which took place in Kyiv on 5 March 2026 as part of the project

- **Strategy** of implementing digitalisation of education within the institution. Important to note here is that the creation of the strategy alone does not bring significant change, but creating an action plan that derives from the strategy and revising both the actions and strategy itself creates consistent changes in digitalising VET education within an institution.
- Creation of a **supportive network** for the staff that could involve for example members of the teaching staff, educational technologist, head of studies, etc.
- Forming **collective agreements** on how the digitalisation of education is carried out appointing responsible people and setting up support practices for teachers.
- Creating **conditions for teachers** to systematically and continuously improve their digital competences.
- Developing an integrated **digital education ecosystem** to coordinate VET institution digitalisation and enhance teacher digital competences.
- **Creation of educational technologist's role** within the VET institution, as educational technologists can support the implementation of the strategy, collective agreements and support teachers in developing their digital competences.

5.1.6. DEVELOPING DIGITAL COMPETENCES OF YOUNG PEOPLE



Photo from a monitoring visit to the Odesa Centre of Vocational and Technical Education

Around 40% of teachers and half of the VET managers brought out that in addition to the digital competences of teachers, the digital competences of students also need development. As the level of students' skills varies greatly, it puts more workload on teachers to develop their skills individually. This feedback aligns well with the common myth surrounding young people as "digital natives", describing young people as skilful users of ICT as they have been surrounded by technology throughout their life. Yet, when developing

digital competences of young people, formal education offers a great opportunity to provide an education that takes into account the emerging need for digital competences across professions.

The preparation of students for life in the digital age is also emphasised in the OECD analysis of digital education policies (see chapter 2.1.) as well as in the strategies and policies shaping the education in Ukraine (see chapter 1.3.).

To develop students' digital competences:

- A creation of a **mandatory study module/course** on digital competences is proposed.
- In addition to the digital competences standards of teachers, similar **standards should be developed for students**. Through learners' assessment, these competences should be measured and evaluated.
- **Support students' digital competences** by involving digital solutions in learning processes.
- **Provide students with access to necessary devices and software**. As the opportunities to own their own devices varies greatly among students, it creates an unequal access to educational resources.

5.1.7. SYSTEMISED APPROACH TOWARDS DIGITALISATION ON NATIONAL LEVEL

According to the input gathered from VET teachers, managers and local government education officials, the national policies of Ukraine in the field of digitalising VET education have been supporting the processes in the field in general. Therefore, on a national level, the work on supporting digitalisation of VET education with strategies, policies and regulations should continue. As the New Ukrainian School policy emphasises – integration of ICT in the education sector must be a comprehensive process and not rely on isolated initiatives (see chapter 1.3.).

With a more comprehensive process, possible risks could be mitigated and opportunities to harvest the potential of digital technologies in (VET) education realised. For example, it is important to avoid the possible vendor lock-in in the future (by informed choice, taking responsibility, determination and cooperation with other consumers⁷⁸) which could be done with strategic planning and development of digitalising education in Ukraine.

⁷⁸ Kikkas, K., Saadjärv, R. (2026). Eesti haridussüsteem tehnoloogiliste ja juriidiliste muutuste tuules. – E. Kindsiko (toim), Eesti inimarengu aruanne 2026. Haridus ühiskonna peeglis (lk 238–246). Eesti Koostöö Kogu. <https://2026.inimareng.ee/aruanne/tarkvara-uuendatud-aga-kas-oppimine-ka/eesti-haridussusteem-tehnoloogiliste-ja-juriidiliste-muutuste-tuules/>



Photo from a monitoring visit to the Odesa VET Centre of the State Employment Service

5.2. OVERVIEW OF THE IMPLEMENTATION OF POLICY RECOMMENDATIONS

In the following table (Table 2, p. 39), an overview is provided based on the policy recommendations from the previous chapter. Together with the policy recommendations, implementing parties are brought out with the objective that the policy recommendation is serving. It is important to note here that often the implementation processes should be collaborative, involving the stakeholders from the field of education and digitalisation, and therefore a responsible party of the implementation is highlighted in the table.

It is important to note here that the process of implementing the policy recommendation is synchronous, meaning that all the recommendations should be implemented at the same time. As the policy recommendations are intertwined, implementing one, requires also the implementation of others. To give an example – by ensuring educational institutions with necessary equipment and access (e.g. devices, connection to the internet and usage of different software) does not guarantee that these investments are put in use, as they do require skilful users (digitally competent teachers). The described recommendations are interdependent and take into account different aspects (devices, skills, strategies, access, etc.) of digitalising education and therefore should not be approached somewhat separately from each other. While some recommendations are somewhat more fundamental (e.g. infrastructure) compared to others (e.g. students' skills), then students' skills cannot be developed if there is no connection to the internet or the institution lacks devices for students to use. Overall, each recommendation serves the goal of digitalising VET education.

POLICY RECOMMENDATION	IMPLEMENTATION	OBJECTIVE
1 Investments in infrastructure	State (in some cases with collaboration of private sectors)	To ensure high-speed and quality connection to the internet for educational institutions. This allows institutions to use professional software and digital solutions in vocational training.
2 Investments in equipment and educational access	State in collaboration with local government, private sector, educational institutions	To provide educational institutions with modern digital tools and access to digital content (software). This allows educational institutions to use the devices and software relevant to their field and labour market.
3 Developing teachers' skills and competences	State, in collaboration with educational institutions	To ensure teachers' skills and competences are up to date and teachers can implement digital technologies proficiently and purposefully. This allows institutions to harvest the potential of digital technologies in vocational education.
4 Creation of digital learning materials	State in collaboration with educational institutions	To ensure that digital technologies are integrated in education. With digital learning materials, digital devices can be used for the purpose of education and developing digital competences of both teachers and students.
5 Systemised and sustainable approach on institutional level	Educational institutions in collaboration with staff	To ensure that educational institutions are approaching digitalising education in a systematic manner. With a strategy and an implementation plan, an institution can have a holistic view and approach in addressing the challenges and opportunities of digitalising education.
6 Developing digital competences of young people	State in collaboration with educational institutions	To ensure that graduates have obtained the skills and competences necessary in their field of work, as well as general digital competences needed in the adult life of the digital age.
7 Systemised approach on national level	State in collaboration with actors in educational field	To ensure a strategic view, guidance and understanding of priorities in the field of digitalising education in Ukraine.

Table 2. Overview of the policy recommendations, implementation parties and objectives.

6. PRACTICAL EXPERIENCE AND IMPLEMENTATION OF DIGITAL TRANSFORMATIONS IN VOCATIONAL EDUCATION

This chapter summarizes the practical experience gained during the implementation of the program “Empowering Vocational Education and Training: A Systemic Approach through Digital Competence Training and Educational Technology Curriculum Development.” It serves as an evidence base for strategic decision-making and demonstrates the viability of the proposed models under the conditions of martial law.

The program on developing digital competences of VET managers and teachers was designed as a comprehensive ecosystem that integrates in-depth in-person training, remote scaling, and a system of continuous support. This approach ensured the sustainability of results and reached a broad range of educators, despite security challenges and resource constraints. The program for the development of digital competencies holds particular strategic significance due to its direct impact on economic resilience and the future reconstruction of Ukraine through the high-quality transformation of workforce training.

During the development of the training component, we aligned our efforts with current state standards and European qualification frameworks that define digital literacy requirements across all levels of vocational education. Specifically, for VET teachers and vocational instructors, the DigCompEdu framework served as the foundation, adapted to Ukrainian professional standards and certification requirements. The training encompassed six key areas: from professional engagement and the creation of secure digital content to the implementation of inclusive approaches and the development of students' critical thinking. For students, the content was based on the DigComp 2.2 concept, which integrates digital competence directly into professional disciplines. This ensures that a modern specialist – from an auto mechanic to an IT professional – possesses not only basic information literacy but also expertise in industry-specific software, cyber hygiene skills, and the ability to work with artificial intelligence.

Within the implementation of the program, this approach fundamentally transformed the management model, allowing managers of institutions to act as architects of modern professional courses and to rapidly adapt the

educational process to real labour market demands – a critical factor for flexible responses to wartime challenges. In parallel, the mastery of cutting-edge tools and AI technologies by educators serves as a reliable guarantee for training a new generation of specialists. These very technicians, craftsmen, and media experts are currently the most sought-after in the market, as they will serve as the primary driving force in overcoming the crisis and rebuilding national infrastructure (see chapter 1.1.). Consequently, the integration of international DigComp standards into the program structure has not only elevated the digital literacy of the community but also laid a solid foundation for developing a competitive workforce capable of effectively contributing to the country's reconstruction.

6.1. TWO-LEVEL IN-PERSON TRAINING MODEL

The primary stage involved the formation of a leadership core for digitalization through direct training of target group of the managers of VET institutions. The program commenced with 2-day intensives for leadership, focused on strategic management and the creation of an innovative environment. During the course, VET managers mastered 23 digital resources, including tools for monitoring educational quality, decision-support systems, and platforms for team coordination. This approach ensured that the subsequent implementation of technologies by VET teachers would receive full support and understanding at the administrative level.



*Photo from a training
for teachers of
vocational institutions*

The next stage involved in-depth practical training for VET teachers and vocational instructors, focused on the direct implementation of innovations in the educational process. During 4-day intensive training sessions, participants mastered 48 innovative tools, applications, and digital platforms. A key feature of this stage was its practicality: 90% of the training time was dedicated to practicing blended learning methods, creating interactive content, and working with AI tools. This immersion allowed participants not only to gain theoretical knowledge but also to emerge with ready-made digital cases for their classes, significantly enhancing the quality of student training.

To objectively determine the program's effectiveness, a comparative analysis of the competencies of 77 VET managers was conducted. The results of self-assessments before and after the training in Table 3 demonstrate not just an improvement in skills, but a fundamental shift in the perception of digital tools as a foundation for management.

PROFICIENCY LEVEL (SCORE)	SELF-EVALUATION BEFORE TRAINING (PERS.)	SELF-EVALUATION BEFORE TRAINING (%)	SELF-EVALUATION AFTER TRAINING (PERS.)	SELF-EVALUATION AFTER TRAINING (%)	DYNAMICS
5 points (Expert)	14	18,8 %	50	64,9 %	+46,7 %
4 points (Confident)	26	33,8 %	22	28,6 %	-5,2 %
3 points (Intermediate)	27	35,1 %	4	5,2 %	-29,9 %
2 points (Elementary)	7	9,1 %	1	1,3 %	-7,8 %
1 point (Minimal)	3	3,9 %	0	0 %	-3,9 %
Total	77	100 %	77	100 %	-

Table 3. Comparative indicators of digital skill proficiency (Leaders)

Based on the analysis of quantitative indicators and qualitative feedback from leaders, the following results can be identified:

- the share of leaders with the highest skill levels increased 3.5 times. This confirms that digitalization has transformed from a "technical issue" into a real tool for daily management;
- participants shifted their priorities – instead of simply creating presentations, the focus moved toward automating routine operations, optimizing communication, and implementing innovative solutions in the overall management of the institution;
- a unique feature of the feedback was the readiness for local dissemination. Most respondents plan to share the acquired knowledge through internal workshops for their staff (reaching up to 80 people in each institution);

- an exceptionally high interest in direct study of Estonia's experience was identified. Leaders are interested not only in theory but also in the practical implementation of digital ecosystems "on the ground" for future student and teacher exchanges with the EU;
- the professionalism of the training staff was specifically noted for their individual approach and ability to inspire, which allowed participants – even those who previously lacked confidence in their technical abilities – to overcome internal barriers regarding technology.

While strategy was the priority for leaders (see chapter 5), for teachers and vocational instructors, the primary indicator became an applied "digital leap".

Table 4 illustrates the self-assessment of VET teachers participating in the trainings. The analysis is based on a detailed processing of feedback.

PROFICIENCY LEVEL (SCORE)	SELF-ASSESSMENT BEFORE TRAINING (PERS.)	SELF-ASSESSMENT BEFORE TRAINING (%)	SELF-ASSESSMENT AFTER TRAINING (PERS.)	SELF-ASSESSMENT AFTER TRAINING (%)	DYNAMICS
5 points (Expert)	40	11,6 %	242	69,9 %	+58,3 %
4 points (Confident)	104	30,1 %	94	27,2 %	-2,9 %
3 points (Intermediate)	141	40,8 %	8	2,3 %	-38,5 %
2 points (Elementary)	46	13,3 %	2	0,6 %	-12,7 %
1 point (Minimal)	15	4,3 %	0	0 %	-4,3 %
Total	346	100 %	346	100 %	-

Table 4. Comparative indicators of digital skill proficiency (VET teachers and vocational instructors)

To ensure the quality of implementation and the validation of the knowledge gained, the Mondo team conducted a series of planned monitoring visits directly to the educational institutions. The purpose of these visits was to analyze the actual status of digital tool implementation, consult with management teams, and verify infrastructure readiness for the new academic year. This allowed to establish a direct link between the project's strategic goals and their practical implementation in classrooms and workshops, as well as developing indicators and benchmarks for scaling digital solutions within vocational education.

6.1.1. VALIDATION OF LEARNING OUTCOMES: ECTS CREDITS AND PROFESSIONAL ATTESTATION

A vital stage in the project's implementation was the creation and launch of two specialized training programs on the national platform Vektor (formerly EdWay): a 16-hour program for leaders and a 32-hour program for teachers and vocational instructors. The platform fully complies with national policies on professional development; therefore, the issued certificates include the necessary activity codes (KVEDs) for the vocational education sector, and the training hours are converted into ECTS credits. This is a critical requirement for the official recognition of learning outcomes during pedagogical staff attestation, allowing the acquired digital competencies to be integrated into their professional trajectory in accordance with current legislation.

Educators themselves emphasize the high significance of these programs, as there is a sharp deficit in the market for courses specifically designed for vocational education that simultaneously meet all state standards. At the same time, the issue of accumulating the mandatory 150 certification hours for attestation remains relevant for teachers, and these programs serve as a substantial contribution toward that goal. In the long term, the level of digital staff training will directly impact institutional accreditation, as only those institutions whose personnel have confirmed the appropriate level of qualification will be granted the right to train specialists at the 5th level of the National Qualifications Framework.



*Photo from a training
for teachers of
vocational institutions*

6.1.2. KEY FINDINGS AND LEARNING OUTCOMES

To conclude the outcomes and key findings of the trainings conducted for VET managers and VET teachers, three most evident findings are outlined:

- the most impressive change was recorded in the expert level category (5 points) – the number of confident users grew from 11.6% to nearly 70%. This confirms that the program built not only knowledge but also steady professional confidence;
- participants who started the training with minimal skills (1 point) transitioned entirely to higher competency categories. They describe their progress as “gaining wide wings” and a tangible sense of professional growth;
- the bulk of educators (over 40%) who previously rated themselves at an intermediate level successfully completed the course following the intensive.

This rapid growth was made possible by working with specific tools: generating educational videos (VidnozAI), creating interactive assistants in Mizou, visualizing content in Canva, and deep mastery of AI models (Grok, Gemini, NotebookLM, professional simulations, and applications for implementing inclusive education).

Beyond the curriculum content, participants noted the good-quality organization and the positive emotional atmosphere of the training, which facilitated the effective absorption of complex technical material.

6.2. CASCADE MODEL, SUPERVISIONS, AND LOCAL DISSEMINATION

To ensure that knowledge did not remain confined to the trained groups, a system for the cascade transfer of experience and knowledge was implemented. A total of 90 individual sessions were conducted.

In each VET institution, one coordinator was designated from among the teachers or vocational instructors who had completed the in-person training program under the project “Empowering Vocational Education and Training: A Systemic Approach through Digital Competence Training and Educational Technology Curriculum Development”. The coordinators were provided with a package of training materials. Within their respective institutions, they conducted workshops and masterclasses and prepared practical cases for attestation

commissions. Close collaboration with them through supervision and mentoring support allowed us not only to scale innovations to hundreds of colleagues but also to build a reliable bridge between international practices and the actual practice of Ukrainian vocational education. This approach ensures the sustainability of the project, as knowledge does not remain within a narrow circle but scales across the entire staff, creating a safe environment for self-education.

A vivid confirmation of academic growth within this model was the case of a coordinator from Ivano-Frankivsk, who, in collaboration with the Mondo team, prepared three scientific articles, integrating practical experience in using AI chatbots into scientific discourse. Specifically, her research was presented at an All-Ukrainian conference and published in a scientific collection, then disseminated to other vocational education institutions.

In parallel with academic achievements, mentoring proved its high practical efficiency in the field of attracting external resources and fundraising. Coordinators mastered grant-writing skills, enabling institutions to attract real investment for modernization. A prime example is the success of a participant from Kremenchuk, Poltava region, who secured funding in the amount of €10,000 within the Skill.ED-2025 program by the Kronospan Foundation to upgrade laboratories and create specialized digital classrooms. A coordinator from Lviv developed an "accessibility checklist" for educational videos and materials to be used in the vocational school's new inclusive educational space.

The dissemination process revealed an exceptionally high demand for digital skills among colleagues on the ground – the number of requests for consultations and training significantly exceeded expected indicators. Participants sought to fully master the toolkit before the start of the new academic year.

Recognizing the urgency of these requests and the need to maintain the pace of digitalization, the project planned a series of specialized webinars designed to reach a large audience and provide answers to educators' most pressing questions in a convenient format.

6.3. WEBINAR – SCALING AND OPEN ACCESS TO KNOWLEDGE

One of the key planned activities of the project was a major online webinar on the "Mondo in Ukraine" YouTube channel⁷⁹. It was designed to meet mass demand and provide ready-made digital solutions before the start of the academic year. We understood that not all colleagues were able to undergo

⁷⁹ Mondo Ukraine Youtube chanel: https://youtu.be/plxG7Nh-Yts?si=ahwd5CEoSyG3LoO_

training due to the limited number of seats and requests were arriving constantly. Therefore, the main goal of the webinar was to create a space for productive communication and offer teachers and vocational instructors ready-to-use, engaging tools that can be applied immediately. The webinar combined theory with demonstrations of innovative platforms such as MIZOU (personalization through AI bots) and Edcafe. Participants noted the particular value of being able to automate routine preparation and assessment, allowing teachers to focus on direct interaction with students. In Table 5, an overview of the indicators achieved with the webinar are illustrated.

LIVE STREAM	478 participants
FOLLOW-UP VIEWS	687 recorded views
CERTIFICATES ISSUED	1035 (448 following the live stream and testing, and 587 certificates after viewing the webinar recording)

Table 5. Outreach indicators

The analysis of viewer activity in the comments on the YouTube channel confirmed that a combined approach to training is essential for Ukraine under wartime conditions, as the security situation and the instability of the power grid impact accessibility. The webinar format provided a unique interactivity, allowing participants to receive answers to their questions in real-time, while simultaneously leaving room for high-quality self-education by viewing recordings at a convenient time. This is critically important in conditions of constant shelling or during business trips when a stable connection is not always available, yet the drive for professional development remains unchanged.

The real impact of the chosen strategy and the emotional response of the professional community are best illustrated by direct quotes from users left under the program's video materials:

"Grateful for the opportunity to watch the recording, as we didn't want to miss such an interesting topic on AI due to the power outage. We attended your trainings. You are so motivating! Please conduct more. Our colleagues enjoy learning online."

(IT Lead at the Centre)

"I am watching the webinar from Tartu, thanks to MONDO. This knowledge provides an opportunity to look at daily work from a different angle and implement changes that are already working in the best colleges in Europe."

(program participant)

"Thank you for such a comprehensive webinar! I especially liked the part about using chatbots for assessing student work. This is a real find! Being able to see the preparation and the entire dialogue between the student and the chatbot, as well as automatic assessment by levels—this will significantly simplify my work and allow me to better understand their thought process. This truly optimizes the learning process. Loved the planning system."

(vocational instructor)

"Thank you for the great selection of digital resources. Lesson plans made simple. We will start the new academic year with ease!"

(VET teacher)

6.4. INTERNATIONAL EXPERIENCE: STUDY VISITS TO ESTONIA

A vital component of the project is studying the advanced experience of Estonia – one of the global leaders in the digitalization of society and education. During the program's implementation, three targeted study visits were organized, ensuring the transfer of knowledge across all levels of management. These were not merely introductory trips; each visit was a week-long course of intensive immersion into production and educational processes, requiring full engagement from the participants. Study visits were conducted for three different target groups related to the digitalisation of VET education in Ukraine:

- **Strategic level (Ministry of Education and Science of Ukraine and Ministry of Economy of Ukraine).** Ministry representatives studied the architecture of the Estonian digital ecosystem and the regulatory mechanisms governing distance learning at the state level in detail;
- **Management level (institutional leaders).** Pre-selected directors and deputies mastered “smart institution” management, focusing on the digital transformation of colleges;
- **Practical level (teachers and vocational instructors).** Educators underwent practical internships, directly studying the technical equipment and teaching methodologies in Estonian vocational centers.



Photo from a study visit to Estonia for representatives of the ministries



Photo from a study visit to Estonia for VET managers



Photo from a study visit to Estonia for VET teachers

The study visits included work at leading institutions in the cities of Tallinn, Tartu, and Olustvere, where participants focused on the following areas:

INSTITUTION	KEY ASPECTS OF THE INTENSIVE AND AREAS OF STUDY
Tallinn Polytechnic (<i>Tallinna Polütehnikum</i>)	Studying advanced experience in training IT specialists, media specialists, and technicians; detailed analysis of the architecture of modern teaching workshops and laboratories in a digital environment.
Tallinn College of Engineering (<i>Tallinna Tehnoloogiakolledž</i>)	Researching models for integrating higher applied and vocational education; practical use of digital platforms for monitoring and managing student performance.
Tartu Vocational College (VOCO)	Analysis of the operations of one of Estonia's largest centres; studying synergy between different vocational fields and the implementation of digital solutions directly into vocational training.
Centre for Educational Technology, University of Tartu	Scientific and methodological block: psychology of digital learning, methodology for developing multimedia content, and a system for assessing digital competencies according to EU standards.

Study visits to Estonia allowed participants to see a "living model" of what the Ukrainian reform strives for: from the digital autonomy of the teacher to the total digitalization of documentation and the creation of "smart" learning spaces. It is precisely these highly qualified specialists, trained according to this model, who are becoming the main driving force helping to overcome the crisis, ensuring the stability of production processes, and laying the foundation for the large-scale technological reconstruction of Ukraine.

6.5. CONCLUSION FROM THE IMPLEMENTATION AND OPPORTUNITIES FOR FURTHER DEVELOPMENT

The implementation of the program "Empowering Vocational Education and Training: A Systemic Approach through Digital Competence Training and Educational Technology Curriculum Development" has become a milestone in forming a fundamentally new standard for personnel training in Ukraine under crisis conditions, providing the country with unique experience in building a resilient digital ecosystem.

First and foremost, the effectiveness of the vertical synchronization model was practically proven, where the simultaneous training of managers and educators created a unified conceptual framework and ensured administrative support for innovations directly on the ground. A significant achievement was the

successful adaptation of the European qualification frameworks DigCompEdu and DigComp 2.2 to the realities of martial law, allowing digital competencies to be integrated not as a separate discipline, but as a cross-cutting skill critically necessary for training a competitive specialist.

A special place in this process was held by the mastery of artificial intelligence technologies, which Ukrainian educators learned to use not merely as an auxiliary resource, but as a powerful tool for automating routine processes. This allowed them to compensate for time deficits and focus on providing mentoring support to students.

At the same time, the work with coordinators and the experience of supervisions clearly demonstrated the necessity of introducing the position of an educational technologist into the staffing tables of institutions – someone capable of professionally supporting digital transformation as a sustainable, ongoing workflow.

The experience gained also confirmed the viability of hybrid learning formats, where the combination of in-person intensives with open online resources and webinars ensured the continuity of self-education, even in conditions of energy instability and security threats.

Through the direct transfer of technology and expertise from Estonia, 45 Ukrainian vocational education institutions have gained tangible benchmarks for teacher digital autonomy and the development of "smart institutions," where every element of the environment contributes to the quality of specialist training. Ultimately, this program has allowed participating institutions to transition from a recipient of aid to an equal partner in sharing experience with European counterparts, proving that digital transformation is an integral component of national resilience.

The model developed is now a ready-made blueprint for systemic implementation at the national level, aimed to all VET institutions in Ukraine, as it lays the foundation for training a workforce capable of effectively contributing to the technological reconstruction and future economic prosperity of the country.

7. CONCLUSION

Digitalising VET education requires actions and participation of different stakeholders both from national and local level. As described, for digitalisation of VET education to be successful, different aspects of digitalisation must be provided from good infrastructure to continuously improving the digital competences of those participating in VET education. Promoting only one aspect of digitalisation while ignoring others, does not allow the field as a whole to move towards digitally empowered teaching and learning. There is little use of devices and software when one does not know how to meaningfully integrate them in everyday teaching and learning. And there is little use of digital competences, if one cannot put them into practice.

This does not mean that individuals or institutions are solely dependent on the state – although in some exceptions it could be the case – there are several levers of actions to be taken upon. From an individual perspective, one can consciously reflect on one's digital competences, identify gaps and knowledge missed and actively develop their capabilities and skills. From an institutional perspective, managers and governing bodies can introduce a working culture and environment, where digital competences are supported and encouraged. This could entail actions from strategic planning to continuous training opportunities for teachers and staff members, as well as reorganisation of VET staff and involving experts of educational technology. From the perspective of local governments, activities to support the digitalisation of VET institutions vary from co-financed projects and funding opportunities to setting up guidelines and frameworks to support the managers of VET institutions. Local authorities can also help in shaping the partnerships between businesses and VET institutions, that in turn would support digitalisation of VET education. From the state level, it is crucial to have investments in good infrastructure, as well as to provide strategic support with state policies and targeted programs.

With the changing labour market of Ukraine and professions becoming more dependent on ICT and digital solutions, VET education holds an important role when preparing students for their adult lives.



Photo from a monitoring visit to the Odesa Centre of Vocational and Technical Education

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